

MEMORY

Memory involves three processes: **Encoding, Storage, & Retrieval**

1. **Encoding** is the processes of putting information into memory

There are more or less good ways to ‘put information into memory.’ For example, if one were trying to memorize a list of words there are several levels of processing that could take place, such that deeper levels would produce better encoding.

<table>
<thead>
<tr>
<th>Level of Processing</th>
<th>Type of Encoding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shallow Processing</td>
<td>Structural Coding where the focus is on the physical structure of the stimulus</td>
</tr>
<tr>
<td>Intermediate Processing</td>
<td>Phonemic Encoding where the focus is on the sound of the stimulus</td>
</tr>
<tr>
<td>Deep Processing</td>
<td>Semantic Encoding where the focus is on the meaning of the stimulus</td>
</tr>
</tbody>
</table>

Another way of encoding information is through elaboration, where the stimulus or information is linked to something else, such as the self (self-referential encoding) or visual images. The latter relies on duel-coding theory, which asserts that creating a visual image of a word allows information enters memory in two ways—semantically and visually.

2. **Storage** refers to the way memories are housed

The storage process is a three part model, such that memory storage progresses (or can progress) through each level of memory storage:

a. **Sensory Memory** is “a memory system that very briefly stores sensory information”

b. **Short-Term Memory** is “a memory storage system that briefly holds a limited amount of information in awareness”

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1. The terms and definitions are from or slightly altered from Weiten, *Psychology Themes & Variations (4th ed)*, p. 277
2. Information is from Weiten, *Psychology Themes & Variations (4th ed)*, pp. 277-278
Research by George Miller found that the capacity for short-term memory is 7 (± 2) pieces of information.

Other research shows that this can be expanded somewhat by **chunking** in which *information is group together in a meaningful way* (think phone numbers or acronyms).

**Working Memory** is closely associated with short-term memory (and in some ways, long-term memory), but it is a distinct memory system that is analogous to the desktop on your computer. *It refers to the information being used at the moment.*

- It might be useful to think about working memory as the memory system that sits between short-term and long-term memory and/or relies on both systems.
- Some researchers have proposed that working memory has four components.

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5 The description and figure are adapted from Weiten, *Psychology Themes and Variations* (9th ed), p. 281
c. **Long-Term Memory** refers to the “relatively permanent storage of information”\(^6\)”

- One of the ways that memories are thought to be stored is in **associative networks**, in which an “each unit of information in the network is a node, [and] each node is connected to many other nodes. The resulting network is like the lined neurons in your brain, but nodes are simply bits of information. They are not physical realities.”\(^7\)”

3. **Retrieval** is the process whereby memories are recovered or retrieved from the memory bank

- **Retrieval Cues** (e.g., Context Cues) is a phenomenon in which memories are recalled or remembered by a trigger, such as the context (e.g., remembering what you were supposed to be doing by going in the room where the information was encoded)

- “**Misinformation Effect** occurs when ...recall of an event ...is altered by introducing misleading postevent information”\(^8\)”(e.g., when you falsely recall snorkeling on your last vacation because others have asked you about snorkeling on your last vacation)

**Quest:** *How can each of these phenomena be understood by viewing memory as an associative network?*

**Why do we forget?**

1. **Ineffactual encoding** sees that forgetting is not forgetting at all because the information was never stored in memory. From this perspective, forgetting occurs because of shallow or poor encoding\(^9\).

2. “**Interference theory** proposes that people forget information because of competition from other material.”\(^10\)”

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\(^7\) Gazzaniga et al., *Psychological Science* (4th ed), p. 289  
\(^8\) Weiten, *Psychology Themes and Variations* (9th ed), p. 287  
Proactive Interference occurs “when prior information inhibits the ability to remember new information." 

Retroactive Interference occurs “when new information inhibits the ability to remember old information.”

3. Motivated Forgetting occurs when people forget things they do not want to remember (e.g., traumatic events).
   - This idea is inspired by Freud’s model of the unconscious, such that traumatic or unwanted thoughts are pushed out of consciousness via repression, which “refers to keeping distressing thoughts and feelings buried in the unconscious.”

Quest: Is motivated forgetting a good explanation for forgetting? Why is this controversial? (See Gazzaniga et al.’s discussion of this on pp. 310-312).

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12 Gazzaniga et al., Psychological Science (4th ed), p. 299
13 Weiten, Psychology Themes and Variations (9th ed), p. 294