

Storage: Retaining Information

Atkinson & Shiffrins's Memory Model has 3 stages.

1. Sensory memory is the immediate, initial recording of sensory information in our memory system

We also have short temporary photographic memory called **iconic memory**, the momentary sensory memory of visual stimuli. It is a photographic/picture-image memory lasting no more than a few tenths of a second.

We also have fleeting memory for auditory sensory images called **echoic memory** or the momentary sensory memory of auditory stimuli; if attention is elsewhere, sounds and words can still be recalled within 3 or 4 seconds.

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2. Short-Term Memory
 This is our activated memory that holds few items briefly such as a telephone number that you just looked up in the directory and dialed.

Without active processing, short-term memories have a limited life.

Short-term memory is limited in capacity -approximately 7 *chunks* of information can be retained at any given moment.

- better for numbers than letters
- better for sounds than sights

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3. Long-Term Memory

This is our brain's relatively permanent and practically limitless storehouse of the memory system.

Forgetting occurs as new experiences interfere with retrieval of long-term memories and as our physical memory trace gradually decays.

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Karl Lashley removed pieces of rat's cortex as it ran through maze and found that no matter what part of the cortex was removed, partial memory of solving the maze stayed. He concluded that memories do not reside in a single specific spot.

Psychologists then focused on the **role of the neuron** and came up with the following findings:

1. Long-term potential (LTP): The increase in a synapse's firing potential after brief, rapid stimulation; it is believed to be neural basis for learning and memory. After long-term potential occurs, passing electric current through the brain will not disrupt old memories, but it will wipe out recent experiences. For instance, when a person with a blow to the head from a car accident doesn't remember what occurred in the seconds leading up to the accident.

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2. Drugs that block the neurotransmitters will also disrupt information storage, such as when people under the influence of alcohol do not remember the events of the previous evening. (Serotonin is disrupted.)

3. Stimulating hormones can affect memory, as there appears to be more glucose available to fuel brain activity, indicating an important event. This appears to etch events into the brain, events such as your first kiss, a tragic event, the birth of a child, or failing your psychology test.

- adrenaline/cortisol (stress) can activate amygdala - hippocampus and cause stronger memories to form
- More emotion = stronger memories.
- Prolonged stress can erode memories/

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Amnesia refers to the loss of memory. It was found that people who don't have memories could still learn, indicating that two memory systems are operating in order.

Implicit memory: the retention without conscious recollection (of skills and dispositions), such as how to do something.

Explicit memory: the memory of facts and experiences that one can consciously know and "declare", such as what happened in a specific situation.

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Research Notes:

-Through brain scans, it was found that the **Hippocampus**, the neural center located in limbic system, helps process explicit memories for storage.

-Damage to left side of hippocampus produces difficulty in remembering verbal info, but no trouble recalling visual designs and locations.

-Damage to right side of the hippocampus produces difficulty in remembering visual designs and locations, but no trouble recalling verbal information.

-When the hippocampus was removed from monkeys, they lost recent memories, but old memories remained intact, suggesting that the hippocampus was not an area of permanent storage. It is known that long-term memories scattered across various parts of frontal and temporal lobes.

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