

MEMORY

DEFINITION

Memory is the ability to take in information, store it, and recall it at a later time. In psychology, memory is broken into three stages: encoding, storage, and retrieval.

To recall events, facts or processes, we have to commit them to memory. The process of forming a memory involves encoding, storing, retaining and subsequently recalling information and past experiences.

Cognitive psychologist *Margaret W. Matlin* has described memory as the “process of retaining information over time.” Others have defined it as the ability to use our past experiences to determine our future path.

When they are asked to define memory, most people think of studying for a test or recalling where we put the car keys. However, memory is essential in our everyday lives. We would not be able to function in the present or move forward without relying on our memory.

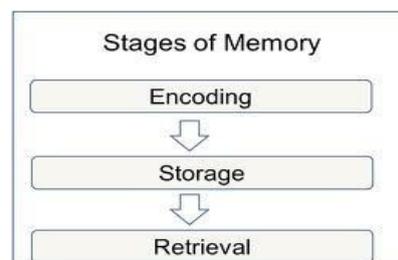
The process of encoding a memory begins when we are born and occurs continuously. For something to become a memory, it must first be picked up by one or more of our senses. A memory starts off in short-term storage. We learn how to tie our shoe, for example. Once we have the process down, it goes into our long-term memory and we can do it without consciously thinking about the steps involved.

Important memories typically move from short-term memory to long-term memory. The transfer of information to long-term memory for more permanent storage can happen in several steps. Information can be committed to long-term memory through repetition — such as studying for a test or repeatedly taking steps until walking can be performed without thinking — or associating it with other previously acquired knowledge, like remembering a new acquaintance Mrs. Emerald by associating her name with an image of the green jewel.

Motivation is also a consideration, in that information relating to something that you have a keen interest in is more likely to be stored in your long-term memory. That's why someone might be able to recall the stats of a favorite baseball player years after he has retired or where a favorite pair of shoes was purchased.

We are typically not aware of what is in our memory until we need to use that bit of information. Then we use the process of retrieval to bring it to the forefront when we need to use it. Again, much of this recall happens without having concentrate on it — particularly with common tasks such as shoe tying — but there are other types of memories that take more effort to bring to the forefront.

Memory loss is often associated with aging, but there are a number of things that can trigger short- and long-term memory loss, including injury, medications and witnessing a traumatic event.



STAGES OF MEMORY

The three stages of memory: encoding, storage, and retrieval. Problems can occur at any stage of the process.

1. *Encoding (or registration)*: the process of receiving, processing, and combining information. Encoding allows information from the outside world to reach our senses in the forms of chemical and physical stimuli. In this first stage we must change the information so that we may put the memory into the encoding process.
2. *Storage*: the creation of a permanent record of the encoded information. Storage is the second memory stage or process in which we maintain information over periods of time.
3. *Retrieval (or recall, or recognition)*: the calling back of stored information in response to some cue for use in a process or activity. The third process is the retrieval of information that we have stored. We must locate it and return it to our consciousness. Some retrieval attempts may be effortless due to the type of information. Problems can occur at any stage of the process, leading to anything from forgetfulness to amnesia. Distraction can prevent us from encoding information initially; information might not be stored properly, or might not move from short-term to long-term storage; and/or we might not be able to retrieve the information once it's stored.

TYPES OF MEMORY

Sensory Memory

Sensory memory allows individuals to retain impressions of sensory information after the original stimulus has ceased. One of the most common examples of sensory memory is fast-moving lights in darkness: if you've ever lit a sparkler on the Fourth of July or watched traffic rush by at night, the light appears to leave a trail. This is because of "iconic memory," the visual sensory store. Two other types of sensory memory have been extensively studied: echoic memory (the auditory sensory store) and haptic memory (the tactile sensory store). Sensory memory is not involved in higher cognitive functions like short- and long-term memory; it is not consciously controlled. The role of sensory memory is to provide a detailed representation of our entire sensory experience for which relevant pieces of information are extracted by short-term memory and processed by working memory.

Short-Term Memory

Short-term memory is also known as *working memory*. It holds only a few items (research shows a range of 7 +/- 2 items) and only lasts for about 20 seconds. However, items can be moved from short-term memory to long-term memory via processes like *rehearsal*. An example of rehearsal is when someone gives you a phone number verbally and you say it to yourself repeatedly until you can write it down. If someone interrupts your rehearsal by asking a question, you can easily forget the number, since it is only being held in your short-term memory.

Long-Term Memory

Long-term memories are all the memories we hold for periods of time longer than a few seconds; long-term memory encompasses everything from what we learned in first grade to our old addresses to what we wore to work yesterday. Long-term memory has an incredibly vast storage capacity, and some memories can last from the time they are created until we die.

There are many types of long-term memory. *Explicit* or declarative memory requires conscious recall; it consists of information that is consciously stored or retrieved. Explicit memory can be further subdivided into *semantic memory* (facts taken out of context, such as "Paris is the capital of France") and *episodic* memory (personal experiences, such as "When I was in Paris, I saw the *Mona Lisa*").

In contrast to explicit/declarative memory, there is also a system for procedural/implicit memory. These memories are not based on consciously storing and retrieving information, but on implicit learning. Often this type of memory is

employed in learning new motor skills. An example of implicit learning is learning to ride a bike: you do not need to consciously remember how to ride a bike, you simply do. This is because of implicit memory.