Lecture1: Memory

1. Definition of memory

Spear and Riccio (1994, as cited in Radvansky, 2015, p. 3) considered that memory refers to three principle meanings:

> "First, memory is the location where information is kept, as in a storehouse ... Second, memory can refer to the thing that holds the contents of experience, as in a memory trace or engram ... Finally, memory is the mental processes used to acquire (learn), store, or retrieve (remember) information."

The first and third meanings are the most fundamental ones for a learner. Therefore, we stress the definition that memory is a kind of warehouse where information, derived by the senses from the environment, are stored and become available to be recalled by the individual whenever required.

Table 9.1 Memory Conceptualized in Terms of Types, Stages, and Processes.

As types	Explicit memory Implicit memory
As stages	Sensory memory Short-term memory Long-term memory
As processes	Encoding Storage Retrieval

2. Memory Processes

If we take into consideration the fact that memory is the cognitive faculty for data processing[1] (the third definition above), we will emphasize three stages through which any information is processed: encoding, storage and retrieval.

a. Encoding: It is the process of receiving, processing, combining and getting information into memory. If information or stimuli never gets encoded, it will never be remembered. Encoding allows information from the outside world to reach our senses in the forms of chemical and physical stimuli Encoding requires paying attention to information and linking it to existing knowledge in order to make new information meaningful and thus easier to remember.

People automatically encode some types of information without being aware of it. For example, most people probably can recall where they ate lunch yesterday, even though they didn't try to remember this information. However, other types of information become encoded only if people

[1] Memory is the ability to take in information, encode it, store it, and retrieve it at a later time.

pay attention to it. College students will probably not remember all the material in their textbooks unless they pay close attention while they're reading.

b. Storage: It consists of retention of information over time. Information can be gathered in three main storage areas: sensory memory, short-term memory and long-term memory. These areas vary according to time frames.

c. Retrieval (or recall): The third process is the retrieval of information that we have stored. it is the process of getting information out of memory. The ability to access and retrieve information from memory allows you to use the memories to answer question, perform tasks, make decisions, and interact with other people. So, the calling back of stored information in response to some cue for use in a process or activity.

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. In other terms, failures can occur at any stage, leading to forgetting or to having false memories. The key to improving one's memory is to improve processes of encoding and to use techniques that guarantee effective retrieval. Good encoding techniques include relating new information to what one already knows, forming mental images, and creating associations among information that needs to be remembered. The key to good retrieval is developing effective cues that will lead the rememberer back to the encoded information.

3. Types of Memory

Psychologists have found that memory includes three important categories: sensory, short-term, and long-term.

3.1 Sensory Memory

Sensory memory allows individuals to retain impressions of sensory information after the original stimulus (looks, sounds, feels, etc.) has ceased. **Sensory Memory** stores incoming sensory information in detail but only for an instant. The capacity of sensory memory is very large, but the information in it is unprocessed Visual sensory memory is called **Iconic Memory**; auditory sensory memory is called **Echoic Memory, tactile sensory memory is called haptic memory**. 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.

3.2 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.

3.3 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 (linguistic knowledge, meanings, facts taken out of context, such as "Paris is the capital of France", etc.) and *episodic* memory (personal experiences, such as "When I was in Paris, I saw the *Mona Lisa*"). Biographical memory is a type of semantic memory where events like first day at school and the one's own last birthday are stored. It is composed of personal episodes, family events and educational and career history.

In contrast to explicit/declarative memory, there is also a system for rocedural/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.

Resources

Introduction to Memory | Boundless Psychology (lumenlearning.com)
Memory Process - encoding, storage, and retrieval (thepeakperformancecenter.com)
https://courses.lumenlearning.com/boundless-psychology/chapter/introduction-to-memory/
Memory (Encoding, Storage, Retrieval) – UPEI Introduction to Psychology 1
https://opentextbc.ca/introductiontopsychology/chapter/8-1-memories-as-types-and-stages/