

## **MEMORY**

The Phenomenon of memory is indication that learning has persisted over time. It is our ability to store and retrieve information. Memory has been studied intensely by psychologists since the pioneering work of Hermann Ebbinghaus more than a century ago (Ebbinghaus, 1885/1964). The intense interest in memory

is hardly mysterious. The lives of individuals have meaning only because of memory. Our immediate and distant past defines who we are, what we believe, what we can do, and what we feel.

Memory is the basis for knowing our friends, our neighbors, the language, the national anthem, and ourselves. If memory was nonexistent, everyone would be a stranger to us; every language foreign; every task new; and even you yourself would be a stranger.

### **Definition**

**“Memory is the process of maintaining information over time.” (Matlin, 2005)**

**“Memory is the means by which we draw on our past experiences in order to use this information in the present’ (Sternberg, 1999).**

Memory is the term given to the structures and processes involved in the storage and subsequent retrieval of information. Memory is essential to all our lives. Without a memory of the past, we cannot operate in the present or think about the future. We would not be able to remember what we did yesterday, what we have done today or what we plan to do tomorrow. Without memory, we could not learn anything.

Memory is involved in processing vast amounts of information. This information takes many different forms, e.g. images, sounds or meaning. For

psychologists the term memory covers three important aspects of information processing:

### **Stages of Memory**

**Encoding**



**Storage**



**Retrieval**

#### **1. Memory Encoding**

When information comes into our memory system (from sensory input), it needs to be changed into a form that the system can cope with, so that it can be stored.

Think of this as similar to changing your money into a different currency when you travel from one country to another. For example, a word which is seen (in a book) may be stored if it is changed (encoded) into a sound or a meaning (i.e. semantic processing).

There are three main ways in which information can be encoded (changed):

**1. Visual (picture)**

**2. Acoustic (sound)**

**3. Semantic (meaning)**

For example, how do you remember a telephone number you have looked up in the phone book? If you can see it then you are using visual coding, but if you are repeating it to yourself you are using acoustic coding (by sound).

Evidence suggests that this is the principle coding system in short-term memory (STM) is acoustic coding. When a person is presented with a list of numbers and letters, they will try to hold them in STM by rehearsing them (verbally).

Rehearsal is a verbal process regardless of whether the list of items is presented acoustically (someone reads them out), or visually (on a sheet of paper).

The principle encoding system in long-term memory (LTM) appears to be semantic coding (by meaning). However, information in LTM can also be coded both visually and acoustically.

## **2. Memory Storage**

This concerns the nature of memory stores, i.e., where the information is stored, how long the memory lasts for (duration), how much can be stored at any time (capacity) and what kind of information is held.

The way we store information affects the way we retrieve it. There has been a significant amount of research regarding the differences between Short Term Memory (STM) and Long Term Memory (LTM).

Most adults can store between 5 and 9 items in their short-term memory. Miller (1956) put this idea forward and he called it the magic number 7. He thought that short-term memory capacity was 7 (plus or minus 2) items because it only had a certain number of “slots” in which items could be stored.

However, Miller didn't specify the amount of information that can be held in each slot. Indeed, if we can “chunk” information together we can store a lot more information in our short-term memory. In contrast, the capacity of LTM is thought to be unlimited.

Information can only be stored for a brief duration in STM (0-30 seconds), but LTM can last a lifetime.

### **3. Memory Retrieval**

This refers to getting information out storage. If we can't remember something, it may be because we are unable to retrieve it. When we are asked to retrieve something from memory, the differences between STM and LTM become very clear.

STM is stored and retrieved sequentially. For example, if a group of participants are given a list of words to remember, and then asked to recall the fourth word on the list, participants go through the list in the order they heard it in order to retrieve the information.

LTM is stored and retrieved by association. This is why you can remember what you went upstairs for if you go back to the room where you first thought about it.

Organizing information can help aid retrieval. You can organize information in sequences (such as alphabetically, by size or by time). Imagine a patient being discharged from hospital whose treatment involved taking various pills at various times, changing their dressing and doing exercises.

If the doctor gives these instructions in the order which they must be carried out throughout the day (i.e., in the sequence of time), this will help the patient remember them.