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Remembering and Forgetting: Two sides of the coin

7.1 Introduction

If I ask you to tell me the name of your favourite actor, actress or singer - it won’t take more than a second to come out with the answer. In the same way we all remember our childhood friends, interesting incidents relating to them, our family members, relatives and so many other things. Have you ever wondered that how do we remember all these things, and do not forget them over the period. This is due to a dynamic and vast system in all of us which is known as memory.

The human memory has immense potential. You must be knowing that before the Vedas were scripted, the oral tradition existed which means that the immense wealth of Vedas were passed on from generation to generation by the oral tradition. This was totally dependent on our memory.

In this lesson we will study more about this dynamic system which we call as memory.

7.2 Objectives

After reading this lesson you will be able to:

- explain memory;
- differentiate between the stages of memory;
- describe forgetting;
- list some strategies for enhancing memory.
7.3 Memory and Forgetting

Psychologists consider memory and learning to be different processes, though, both are closely related. Whereas, learning refers to the acquisition of new behaviours through experience, memory refers to the process of storing of information that can be retrieved when required. In this lesson you will learn about memory and forgetting. You can very easily understand the significance of memory by visualizing a situation about a person who has lost his memory. He/she will lose identity and cannot connect various experiences, events, and people. The person will lead a miserable life. This happens in brain damaged people or in old age when people develop some kind of memory loss, as in Alzheimer’s disease.

Memory refers to the set of processes involved in storing information and the specific process is termed as retention. Cognitive psychologists define memory as a perceptually active mental system that receives, enodes, modifies, and retrieves information. We can not directly observe the process of memory. It can be studied indirectly by way of measuring retention. Three basic methods of measuring retention are: Recall, Recognition, and Relearning. Let us briefly discuss these three methods of measuring retention.

Recognition, Recall and Relearning

When you are not able to remember someone’s name but you know that you have seen his/her face before, this is the process of recognition. In this process you are checking the stimulus (face) with your memory content to find out the match. In the same manner when one tries to remember a name without a face in front, it is called as recall. Recall is a process of using a general stimulus and finding the information that is in the memory. When you are given a question in essay you use the process of recall. When you answer multiple choice items, you are asked to match the information with the provided pieces of information. You have to identify and match it with the information which is already stored in your memory. Recognition is more successful because it is easy.

Relearning is the method of learning the material second time. It usually takes less time than original learning.

7.4 Stages of Memory

Through research psychologists have discovered that memory is not a single system, it has more than one distinct system. In other words, there are more than one type of memory. According to the most acceptable model of memory, there are three major systems of memory: The Sensory Memory; Short-term memory(STM), and Long-Term Memory (LTM). Information moves successively through these three systems, if attention is given to the material. If attention (focused awareness) is not given, information does not move further into the system.
Table 7.1: Nature of three systems of memory

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sensory Memory</th>
<th>Short term Memory</th>
<th>Long term Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>Iconic about ½ sec</td>
<td>20 seconds</td>
<td>Life time</td>
</tr>
<tr>
<td></td>
<td>Echoic about 2 sec</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td>Large</td>
<td>7 + 2</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Forgetting</td>
<td>Trace decay</td>
<td>Decay, interference and displacement.</td>
<td>Interference, Decay</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lack of Cues</td>
</tr>
<tr>
<td>Encoding</td>
<td>Sensory (visual)</td>
<td>Phonological or visual-semantic</td>
<td>Semantic and sensory</td>
</tr>
<tr>
<td></td>
<td>(auditory)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retrieval</td>
<td>Parallel search</td>
<td>Serial exhaustive search</td>
<td>Parallel distributed search</td>
</tr>
</tbody>
</table>

**Sensory Memory:** Hold any object about 12 inches in front of you. Look at it steadily for a while. Close your eyes and notice how long the clear image of that object lasts? A clear visual image of any object will last in sensory memory for about half a second after the stimulus is no longer received by the receptors. Sensory memory holds representations of sensory input for brief periods of time, depending upon the modality involved. There are different sensory registers for each of the senses. The visual register is called *iconic memory* and auditory register, *echoic memory*. The iconic memory lasts about half a second and the echoic memory lasts several seconds. Most of the information that enters our sensory registers is lost because we do not attend to all that is registered, whatever we attend to moves on to the next stage of memory.

**Short-Term Memory (STM):** Look up from this book for a moment and note what attracts your visual attention? Try to identify the sounds and sensation that you are experiencing now. What you have identified is the content of your short term memory. A second type of memory is known as short-term memory or STM. It holds relatively small amounts of information for brief periods of time, usually 30 seconds or less. This is the memory system we use when we look up at the phone number and dial it. If we are connected on the first instance the telephone number is forgotten. However, if we get the line engaged for some time, we keep on dialing the number and through repeated dialing rehearsal of the telephone number pushes it to the long-term memory (LTM) storage.

However, it has been established now that short-term storage is more than a passive “holding area” (e.g. holding a telephone number). On the contrary, it involves active processing of information. This finding has led the psychologists now to use the term *working memory*. It means that something active goes on during the short-term memory stage, e.g., simple computations.

STM has a limited capacity to hold information. It has been found that it is able to hold about 5 to 9 units (the “magic number” 7 + 2) of information at one go. If the number of
units goes higher, new information displaces or writes over the existing units. Thus, it is easy to remember a telephone number consisting of 7 to 9 digits. If more information is added we lose at least part of the phone number. However, this limitation in capacity can be effectively expanded by a process known as chunking. That is several units of meaningful information are packed into one chunk. For example the number 194720021941 (12 digits) can easily he remembered if the 12 digits are chunked into three units 1947, 2002, 1941, all referring to calendar years.

**Long - Term Memory (LTM):** It is a memory system for the retention of large amounts of information for long periods of time. It is the memory system that permits us to remember events that happened many years ago, yesterday, last year, and so on. It is the long term memory that allows you to remember factual information that makes it possible for us to learn different subjects, appear in the examinations and perform communication with others etc. It brings continuity and meaning in our life.

When we pay attention to an information and engage in active rehearsal the material is stored in the long term memory (LTM). Information in the sensory memory enters short-term memory when it becomes the focus of our attention. If we do not pay attention to the incoming sensory information, the material fades and quickly disappears. We tend to pay attention to certain information and not to the other. Paying attention to certain aspects of our world is what we call “selective attention”. The information from STM is often rehearsed by us. This rehearsal helps the transfer of that information from STM to LTM.

### INTEXT QUESTIONS 7.1

1. What is Recall?

2. List the stages of Memory.

### 7.5 Forgetting

Sometimes we are unable to remember information that we need at a particular time, perhaps, we have lost the information. We find that on some occasions this lets us down, we are unable to remember the information that we require desperately. During examinations we are unable to remember or retrieve what we had learned. Why does this occur? This
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is what we call forgetting. Many explanations have been offered to explain this phenomenon decay. Let us briefly consider some explanations to explain the causes of forgetting.

(i) Decay: Some psychologists think that it is due to fading of memory traces or decay that happens with lapse of time. This does not explain why certain memories fade forever while other seem to be well preserved. Passing of time cannot, therefore, be considered as the cause of forgetting. You can see that in the Table 7.1.

(ii) Interference: A more useful explanation is found in the view called interference theory. It argues that memories are not lost so much because of decay as they are because of what happens to them during the period when we retain them. Thus inhibition or interference by subsequent learned material. There are two types of such interferences - Retroactive interference and Proactive interference. Retroactive interference (acting back wards) occurs, when the current information interferes with what has been retained earlier. For example, you learn Punjabi language on Monday and Bengali on Tuesday. During a Punjabi test taken on Wednesday interference is expected from the learners of Bengali words. Forgetting may occur due to (acting forwards) proactive interference. This is a situation in which earlier information in the memory interferes with the current information. Suppose you have been driving a scooter with gears. Now, you have a new scooter which has no gears (automatic drive). You will tend to change the gears in the new scooter and this habit can persist for long. Proactive interference thus explains one’s inability to acquire new knowledge or habit because of the powerful interference from old habits.

(iii) Motivated Forgetting: Freud considered that why we forget is often motivated. Unpleasant, painful, or threatening situations are forgotten or what Freud called repressed (a defense mechanism). We tend to forget what is unpleasant to us.

(iv) Stimulus Encoding: Recent studies indicate that the way we encode an information and its context play important role in remembering. Our experiences are located in a situation and are encoded in certain form. If the conditions during retrieval are similar to encoding the memory remains intact.

(v) Level of Processing: While learning some material we may attend to it in detail and process at a deeper level or neglect it and attend at a surface level. This may be a cause of forgetting.

7.7 Strategies for Enhancing Memory

How good is your memory? We all would like to improve our memories so that we can retain more facts and information. This is possible with little effort and almost anyone can improve his or her memory. Here are some tips to enhance one’s memory.

1. Deep Processing: If you want to learn something and wish to enter information into long-term memory, you have to think about it. You need to consider its meaning
and examine its relationship to information you already have. Careful planning and considering the meaning of information, and relating to your knowledge is helpful in learning it and remembering it later. The retention of material is dependent directly upon the depth at which it has been processed. Deeper level in terms of meaning is very important. Second, the depth of processing also refers to the rehearsal of material to be remembered, greater the rehearsal more the chances of recalling the material later.

2. **Attending Carefully**: Whatever you want to learn and ensure its retention in long term memory you have to put in conscious effort to attend to the material carefully. So, ensure that you direct your full attention to information you want to remember.

3. **Minimize interference**: You have learned that interference is a major cause of forgetting and you should try to reduce it as much as possible. In general, the more similar the materials to be learned, the more likely they will produce interference. Thus, you should arrange your studies so that you don’t study similar subjects one right after the other. For example, if you have to study two languages, study them on different days.

4. **Distributed practice**: While learning some material it is beneficial to learn it using distributed practice in which there is gap between trials. That is, if the chapter is lengthy, divide the chapter into two or three parts and learn a part in one go. After mastering one part then go to the second and so on. Do not try to cram all information you want to memorize at once.

5. **Using memory aids**: People use various cues, indicators and signs to connect events. This often facilitates remembering. It is called memories. You can use visual imagery to remember objects and places. For example, if you visit a new place, you can remember the location by remembering severa associated objects and places. You may remember the place to be close to a cinema hall, in front of a signal post and so on.

6. **Shorthand codes**: You can develop your own shorthand codes to memorize long list of items. You can use the first letter of each word or item and construct a unique "word". For example, to remember the seven constituents colours of light (VIBGYOR; where V stands for Violet, I for Indigo, B for Blue, G for Green, Y for Yellow, O for Orange and R for Red.) During the school days, I used to forget the order of Mughal emperors in history subject. I developed my own shorthand code: :BHAIJSA" where B stands for Babar, H for Humayun, A for Akbar, J for Jahangir, S for Shahjahan and A for Aurangzeb. It helped me in remembering the names in their order.

**Types of Memory: Recent Views**

In recent years psychologists have conceptualized memory into four types as given below.

**Semantic**: This deals with knowledge, meaning and generalized experiences. What ever we remember from books, information about the world events is included in it.
**Episodic**: It refers to the experiences which are personal to an individual. You do so many things in a day. They are your and only your experiences. Memory of such experiences are accessible by you only. They are part of episodic Memory.

**Procedural**: This deals with memory for actions of ways of doing certain things or performing certain activities.

**Meta Memory**: It is memory for your memory. We not only remember things but also remember that we can remember. People may be good or bad in understanding their own memories.

### 7.7 Memory and Construction

Memory is not-like a tape recorder in which information are contained and retrieved when desired. It has been found that when we encode information, or store it or retrieve it we are actively involved. Our past experiences and their memories also influence. As a result our memories of events, films, discussions and stories etc. often become a constructive and reconstructive process. You will realize that when people talk about certain events their version often differ. In fact people often add, subtract or intensify the material that was experienced. This often happens. Thus our memories are receptive to change.

**Imagery and memory**

An image is a mental representation of some object or event experienced by a person. For instance when we use the word "table" or "tree" we have access to the word as well as an objective representation in mind. We can use the image to prepare the figure of the object represented. You will find that some words like "love", "freedom", and "democracy" do not have any definite concrete way of representation. It has been found that a concept which can be represented through images is retained better than those concepts which do not have any concrete representation. This finding has important implications for memorizing. If you want to memorize a list or some other material try to connect with an image. Any kind of image, if connected with the list facilitates in retaining the list.

### 7.8 Repression: Forgetting painful events

The events and experiences that are threatening or painful are eliminated from our consciousness. This is called repression. Freud believed that repressed memories are pushed into hidden recesses of the unconscious mind, where they remain. Such repressed memories may cause many psychological problems for the individual.

**Amnesia**

Amnesia refers to a loss of memory stemming from illness, injury, drug abuse or other
Two types of Amnesia are worth noting: Korsakoff's syndrome, and Alzheimer's disease.

(i) **Korsakoff's syndrome**: This is an illness caused by long-term abuse of alcohol. It often involves profound retrograde amnesia. That is, patients cannot remember events that took place many years before the onset of their illness. Careful medical examinations of such person's brains after their death indicate that they have experienced extensive damage to portions of the thalamus and hypothalamus, portions that play key role in long-term memory.

(ii) **Alzheimer's Disease**: This illness occurs in 5 percent of all people over age sixty five. It begins with mild problems, such as increased difficulty in remembering names, phone numbers, or appointments. Gradually, patients’ condition worsens until they become totally confused and unable to perform simple tasks like dressing, and experience an almost total loss of memory. In the later stages the patients fail to recognize their spouses and children. Patients lose their past and this is very disturbing to them.

### INTEXT QUESTIONS 7.2

1. In recent view what are the types of memory.

2. State any two causes of forgetting

### 7.9 What you have learnt

- Memory refers to the set of processes involved in storing information and the specific process is termed as retention.
- Three basic methods of measuring retention are: **Recall, Recognition**, and **Relearning**.
- Sensory memory holds representations of sensory input for brief periods of time, depending upon the modality involved.
- The visual register is called **iconic memory** and auditory register, **echoic memory**.
- Short-term memory or STM holds relatively small amounts of information for brief periods of time, usually 30 seconds or less.
- **Long-term Memory** is a memory system for the retention of large amounts of information for long periods of time.
- There are two types of such interferences - **Retroactive interference** and **Proactive interference**.
7.10 **Terminal Exercises**

1. Describe any one stage of memory.

2. What strategies can be adopted for enhancing memory.

3. Write a short note on Amnesia.

7.11 **Key to Intext Questions**

7.1

1. Recall is a process of using a general stimulus and finding the information that is in the memory.

2. Sensory memory, Short term memory, long term memory

7.2


2. Decay, Interference, Level of processing, Motivated forgetting (any two)