

Memory
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Lecture - 26
Forgetting - II

Hello, I welcome you all to the lecture series on memory. Today, we are going to talk about forgetting, extending our discussion from the previous lecture. In the previous lecture, we talked about forgetting, the relevance, and importance of forgetting, the classical experiment of Hermann Ebbinghaus, his proposal of the saving method, and his contribution to memory research on the forgetting curve. Further down the line, we also studied the criticism of the forgetting curve. Today, we are going to understand forgetting in a little more detail with a few examples.

Forgetting motor skills. Do we forget motor skills, or do we not forget motor skills? Why do we forget some motor skills, and why do we not forget some motor skills? What we have learned from the empirical works of memory researchers is that motor skills are resistant to forgetting. They are more robust in nature.

Unlike semantic information, which requires a lot of rehearsal and even then we may forget some information, such as the names and details of our colleagues, friends whom we met 5, 10, or 20 years back. But we never forget how to ride a bicycle, even if we have ridden a bicycle 20 years back, driven a motor car, or cooked a specific dish. So, learning to ride a bike, swim, or skateboard in childhood can get us engaged in those activities again without much trouble, even after an absence of years. Now, the absence of years can be seen as 5, 10, 15, 20 years, or more.

The skill, the motor skill, has been classified into two types. These two classifications suggest and give us a hint. How do we become resistant to forgetting? So, the first classification, the closed-loop classification, is where we talk about continuous skills. Each action cues the next action.

What are you going to do next? When each action becomes a cue, then it becomes circular in nature. Action 1 becomes a cue for action 2, action 2 becomes a cue for action 3, action 3 becomes a cue for action 4, and similarly, action 5, action 6, and action 6 becomes the cue for action 1. And the formation of this circular cue, a closed loop, a

continuous loop, makes your memory more and more resistant. It makes your memory undergo overlearning again and again and again and again.

The moment you are performing action 1, all the other actions get activated, which are going to be called. Get ready. The other type of skill is the open-loop skill. Each action is in response to different stimuli. Handwriting and typing.

It changes over a period of time in response to different types of stimuli present. When you are typing, typing letters will be different from typing numbers. Handwriting will also vary from stimulus to stimulus. This is an open loop. But this motor skill also becomes resistant to change.

From decade to decade, it also changes due to physical interference. Your handwriting may become poor once you develop Parkinson's. So you know how to write. But your physical disability may intervene in that case. So closed-loop skills are more resistant to forgetting compared to open-loop skills.

Here, rehearsal is not happening. We do not practice our handwriting as we used to in kindergarten. Calligraphy. But once we have learned calligraphy, No doubt we can use it, but we still need a few trials of practice.

So, among the two classifications, which is more robust, which is more resistant, is the closed loop. Note, some skills are more complex than the others. A study has been conducted where A group of people was trained and given training for CPR to save lives in life-and-death situations. 100 people were given this training.

What we saw was that when these individuals then practiced Their expertise dropped from 100% to 15% within a year. What does this indicate? It does not indicate, first of all, that it belongs to closed loop or open loop. But it indicates that some motor skills are way more complex than the others.

The motor skill which is becoming resistant to forgetting is because the skill may not be as complex as the other skill, like CPR. Some skills, some abilities, are more complex than the others. Based on the nature of complexity and ambiguity of the task. The forgetting depends upon. So, if the task is simpler in nature, then the retention drop will not be that much.

So, if the task is not CPR but measuring the fever because it is very simple with the It just requires reading the mercury thermometer. What is the reading? Such tasks are simpler. As a result, forgetting will be less.

Forgetting events over time. Now, Warrington and Sanders used the headline from the newspaper. That was more than 30 years ago, and then they tested their participants' memory for this event. So they invited a group of individuals and collected the information from the newspaper 30 years ago, the time when these young middle-aged individuals were in school. These individuals were tested about the information of the event.

What we noticed is that forgetting is occurring. Moreover, younger participants had better memory for both the recent and the past older events. But the elderly participants had a challenge. They had a challenge remembering the old information. They didn't have any problem remembering the recent event.

What does this mean? With the HM case, we understood that the old information becomes independent of a structure. So, once the information becomes independent of a structure, then it doesn't depend on the hippocampus because the memory may be dependent on different parts of the brain, and when the memory has become old and independent of a structure, then this means that when these elderly individuals have to recall the information from these regions, Recall may be a challenge.

Maybe their working memory capacity is not as normal as it used to be when they were young. But one thing is very clear with this Warrington and Sanders experiment: young individuals have a better advantage over the elderly. They are not only able to retrieve information from the recent past but also from old events. Warrington did this test with 392 high school alumni for their ability to recognize classmates and recall their names using a high school yearbook. Berwick reported that

These high school students failed to recall the names of their friends. The rate of forgetting the content was relatively slow, but the specificity of information, that is, recognizing the face or name, remained at 90% for at least 15 years. 15 years In the past, they were able to retrieve the information. More years back, if you go back, that ability should be impaired.

So the ability to recognize faces remained at 90% for at least 15 years and stayed high for over 30 years. It remained high but not as high as 15 years. Lots of practice and

overlearning. The process of studying more than is necessary. Rehearsal, overlearning is a practice.

Every time you do a rehearsal, you are practicing it. The practice effect on memory is a well-established concept and idea. The more you practice, the more overlearning you do, the more rehearsal you do, the more resistant to forgetting your memory becomes. As a result, memory stays for a long period of time. Memory decline is directly associated with aging rather than normal forgetting.

So one thing is very clear. People are not able to recall or remember. It is not because of normal forgetting but because of aging. In previous lectures, we have talked about the hierarchical network model. In that hierarchical network model, we discussed networking, association, and the depth of association.

The widening of the association. In the elderly, this association starts getting compromised as time passes by. Berwick also suggested that a memory store that is resistant to change is known as Perma store, Perma- permanent. Permanent storage for memory store. Long-lasting.

Berwick's findings made him suggest, made him recommend that forgetting and distortion should not be seen together, should not be considered similar. They are separate processes. Now, when we talk about forgetting over the lifespan, how it behaves, the role of forgetting. So, childhood amnesia, we know the deficiency in our ability to recall events, only childhood events. When we were 5 months old, 11 months old, 1 year old, 2 years old, and maximum 3 years old.

As per a few studies and documentation. It doesn't necessarily mean that we are not able to remember, recall, or retrieve the information; it doesn't exist there. That early memory is completely gone, lost. It may be there but in some different form which we are not able to remember. If we remember the nature of its encoding and storage, then we will retrieve it.

Boo, boo, coo, coo. Kind of information, the sound, articulation, production of words. Ma, ma, pa, pa. It may be there, but we are not able to retrieve it. Childhood amnesia is like a memory wall.

At around the age of 3, which tries to inhibit, block us from reaching that level of information. Now after the age of 3, the autobiographical memory becomes richer over a period of time. Some autobiographical memories we forget, we do not remember. But

most of the information we try to keep steady and resistant. Forgetting events over the lifespan.

Prospective studies. In such studies, researchers ask the children to recollect some memories. And then these memories are being tested. And these individuals are being tested on these memories after some period of time to understand how much information they can retrieve. Retrospective studies where the direct comparison between children and adults is being made.

Who remembers the information more and better using the same identical research method? What researchers have reported that in both children and adults with respect to retrospective studies, by the way. That both children and adults will report on the early childhood memory. Or both will generate memories in response to a keyword to the shape of the distribution of memories, which can be graphed. So they have to generate a memory.

The causes of childhood amnesia, the first and the basic cause is the less linguistic ability, the mental lexicon. Lexicon is not there. Mental dictionary is getting started. People are trying to form the information, formulate the knowledge. These young individuals do not have memory in their system.

So they lack linguistic ability, and when we talk about the linguistic ability, we have to talk about the lexical processes and non-lexical processes. They may be having high non-lexical processes. But the lexical processes still need to be developed in these individuals. One may look into a dual root cascade model. Lack of strategies for encoding.

The information, like using the cues at the time of learning, is helpful. But it is helpful. Cues are helpful for us. Priming is helpful for us, even. But with these young individuals, the understanding about the cue and using cues as a strategy for encoding and storage is challenging.

The brain is still under development. Allowing for processing and storing personal information. It hasn't been developed yet. As a result, these individuals cannot form a resistant memory. Their memory cannot be strong enough to be used in the later part of their life.

As a result, their memory becomes inhibited. As a result, we are not able to retrieve the information for less than three years. Another reason for childhood amnesia is the theory of mind, which means children can understand that other people have mental states that

are not shared with themselves. Some people can have different emotional reactions to the same event or understand the event differently.

Theory of mind. So in young adults, the lack of theory of mind is present. As a result, childhood amnesia arises. Now, reminiscence. Recollection of information.

Recollection of memories, recollection bump, and an increase in memory between the ages of 10 and 30. Between 10 and 30, we see a bump before dropping off again. So all reported memories as we age. After 30, it is increasing.

After 10 to 20, decreasing, and after 30, decreasing. Before the bump, again, before the rise, before the rise, there is a decrease. For participants over 35 years, there is a period of stronger recall. Above 35 years. The recall should be higher, higher than this, higher.

It is on the rise. Now, this reminiscence bump, which is happening above 35 years in this individual, is because of his or her consolidated experience and information. Until the age of 35, an individual is now utilizing that consolidated experience and consolidated knowledge. This consolidation of information usage is giving a bump in the stronger recall. Pollyanna principle.

This principle suggests we recall more positive events than negative events. But as I mentioned earlier, in some scenarios, more recall is seen for negative events than positive events. Gluck and Bluck also found that only positive events stand out, leaving the negative events inactive and not significant in nature. Sad memories tend to be recalled evenly across the lifespan. It is easy to recall sad memories over the entire lifespan.

So, the reminiscence bump seen between the ages of 10 and 30 in participants over 35 years of age has a strong recall. More recall is there for positive events than for negative events. Positive events seem to stand out, and sad memories tend to be recalled evenly across the lifespan. Now let us understand why this bump is there in the recollection of information.

Three basic theories: The first theory, the self-narrative hypothesis, suggests that a person develops a sense of his or her identity in a narrative or story form and has compiled memories to support it. So when the compilation is there, the repository is already formed, the memory bank is already being built, and the mental lexicon is ready. Then the recollection of these memories and the bump is easy to observe. So the self-narrative hypothesis involves information related to myself, related to my personal story.

Life script hypothesis. The bump is due to forming a script about our lives instead of separate narratives. When we are talking about the bump, due to forming a script, we are talking about the Gestalt principle, a holistic approach. The whole is more important than some of its parts.

So, the life script hypothesis seems to be beneficial, seems to increase our repository, and this gives us the bump, the reminiscence bump. The idea is tied to Erikson's psychosocial development theory, proposing that we make memories central about ourselves that are self-defining. Any information, the moment you associate it with yourself, it becomes resistant, it becomes robust, and becomes prone to disruption. Sorry, not prone to disruption.

It becomes strong enough. You cannot impair it. It becomes resistant to disruption. The moment you attach it to yourself. The last theory talks about and suggests the reminiscence bump is Conway's self-memory system.

These memories point to long-term personal concepts. Long-term personal concepts we hold about ourselves and unresolved conflicts. Conway is talking about the self-memory system. The moment you attach it to yourself, the moment you attach it to your personal belief system, to yourself, then the personal concept makes the memory more robust and resistant to change. So let us summarize what we studied in this lecture. Forgetting motor skills. Some skills we may forget, some skills we may not forget. Because some skills are more complex than others.

The classification of motor skills, we studied about the closed skills and open skills. In closed skills, every action becomes a cue to the following action. And that is why closed skills are more resistant towards forgetting. Forgetting of events over a period of time. How are we forgetting the information?

The information which is not personal to us. The information which is not related to us. Over a period of time, we try to remove the irrelevant information. The simple reason for such removal is to maintain the memory. It cannot be the storehouse for all types of memories.

All types of information. Because the presence of all types of information, relevant and irrelevant, may create confusion. How the forgetting of events happens over a lifespan, the childhood amnesia, the nature of childhood amnesia, why this barrier is there? Have

we lost the information about our childhood memories or is it the problem of retrieval? Why such inhibition is there?

Does it have an evolutionary benefit? What leads to childhood amnesia? And finally, the reminiscence bump—why is it happening? What is the importance of the reminiscence bump? Why does an individual feel this bump is there?

Is it because of the repository that has increased? The lexicon that has increased? The capacity of working memory to hold information has increased? Or is it because of the self? Because you have attached and associated the information to yourself.

Let us stop here. And in the next lecture, we are going to continue talking about forgetting. Thank you.