

Memory
Prof. Manish Kumar Asthana
Department of Psychology
Indian Institute of Technology Roorkee

Lecture - 33
Memory Disorders

Hello, I welcome you all in the lecture series of memory. As we were discussing about the memory disorders, in earlier lecture we discussed about the interrogate-retrogate amnesia and in detail we studied about the Henry Molaison, Clive and many other cases. Today, what we are going to understand is different types of amnesia. One such amnesia is the Korsakoff disease, which is happening because of chronic alcoholism. In those individuals who are consuming lot of alcohol, slowly and eventually it starts to damage the brain.

So on your screen you can see the two MRI scans. First is stand which is A is from the healthy individuals and the stand B which is below indicates the patient with Korsakoff syndrome. What we see is a damage to the brain areas. The bone area damage can be easily seen in these temporal areas and in the frontal areas if you compare. Even some sort of this formality you can see here at the central part.

(T1-Weighted MRI scans)



A 63-year-old healthy control male



A 63-year-old man with Wernicke-Korsakoff Syndrome

Source: <https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/wernicke-korsakoff-syndrome>

These changes in the brain indicate that the brain regions are under the influence of heavy alcoholism, it starts to change and get impaired. In the long run, the individual face a problem of memory loss. So this form of memory loss due to chronic alcoholism is known as Korsakoff syndrome. Now in Korsakoff syndrome, it is happening with the B1 deficiency of the vitamin. This deficiency of the vitamin is the major cause or the contributor in the amnesia.

What we have seen is that from the temporal lobe to the frontal lobe, the damage starts to happen and it spreads. Generally, in these types of patients, we see that they face difficulty in the formation of new memories, particularly in new episodic events. It is very difficult for them to form episodic memories. At the same time, they also have difficulty retrieving information from their past. So these individuals have retrograde and anterograde amnesia at the same time.

These individuals may encode information, but the retrieval of relevant information seems to be a challenge. Importantly, as we have discussed earlier, recall and recognition. These individuals are better at recognition tasks. So they don't face any problems. Probably because the template they have formed in recognition involves comparing two pieces of information—the incoming information with the existing information—and they just have to match it.

So the information we have on hand Those are independent of the temporal and frontal areas. Because of that, the information becomes independent of those areas. So it becomes easier for the person to do the matching. As a result, they do not have problems with recognition.

But they do seem to have a problem in retrieval. Now, there are several forms of amnesia we have been discussing. In the earlier class also, transient global amnesia, then Korsakoff syndrome leads to amnesia, ECT leads to amnesia, brain injury leads to amnesia, and there are many other ways. And then the drug administration where benzodiazepine, as we discussed, leads to amnesia. So there are many forms of amnesia.

But amnesia is also seen because of psychological factors. Every time, it is not neurological in nature, as we saw earlier, that brain injury has happened, then there is amnesia. It is also happening because of psychological reasons. So, psychogenic amnesia refers to the form of amnesia that is not directly linked to disruption or injury to the brain. So for such types of amnesia, it is not necessary that brain damage has to occur.

So memory loss could be because we haven't encoded the information, we haven't stored the information, or we are unable to retrieve the information. So, being unable to encode, store, or retrieve information may also result in amnesia. So, there are many other forms of amnesia which are not neurological in nature, which are not happening because of disruption or injury to the brain. Those types of amnesia, scientists refer to as psychogenic amnesia.

So, in most cases, a traumatic event of one kind or another causes a strong block. This strong block, this inhibition—the strong block we refer to as inhibition—prevents access to episodic and autobiographical memories. In some cases, even facts of self-identity, where a person does not remember their name, place of birth, local address, age, profession, or marital status, and many more relevant details related to their identity. They are unable to recall any events.

Episodic memory seems to be severely impaired here. Loss of identity may occur without retrograde amnesia, which means new memory formation is intact. Consolidation—new consolidation—is fine. But these individuals seem to have a problem retrieving information from their past and about themselves. So, Schacter in 1996 reported a patient, Lumberjack.

He was admitted to a hospital in Toronto, Canada. He was suffering from dense and complete psychogenic amnesia. which was not neurological in nature. He didn't have any brain injury. He didn't have any trauma or aneurysm in his brain.

His brain was healthy and fine. But when he was being brought to the hospital, he was unable to retrieve his own name, where he lived. He retrieved nothing about his personal past. This is a strange case was very curious to the researchers to understand that without a neurological damage how a person can have a memory loss problem. Now after few days later suddenly a person when he while watching a movie Shogun in 1980s release he was watching a scene of funeral

And while watching this scene of funeral from Shogun 1980 released, it triggered, it reminded him the funeral of his own grandfather. And this trigger helped him to recollect all his personal information. And he overcome this amnesia. He was able to recall his name, home address, And also his entire autobiographical memory returned to him.

This is a very unique case where a person was amnesiac but with a single trial presentation of an event from a movie triggered his entire memory back. The another

form of amnesia, as psychogenic amnesia, we were talking about it, there is another form of amnesia which is also not neurological in nature. Dissociative amnesia. It is a condition in which only a traumatic event or event closely related to that trauma are not remembered. Which means when the trauma has occurred,

The person doesn't remember the trauma and the related events. This is a strange case where a person tried to dissociate himself or herself from the trauma and he withdraws himself. This dissociative amnesia is a retrograde amnesia as it refers to the inability to remember a specific past or events. So in this case, individual encounters the retrograde amnesia where he forgets his past information. without any neurological damage, without having any kind of physical trauma also.

This is more psychological in nature. Most patients suffering from dissociative amnesia have equivalent semantic knowledge. So their semantic knowledge is same as healthy individuals. So these patients have equal semantic knowledge equal to all the individuals but have lost the episode access to the trauma which means this episode they do not remember the episode related to the trauma is being impaired. The semantic information is intact.

However, the trauma and episodic memory related to that trauma is being impaired. Dissociative puke, when we are talking about, it is another form of psychogenic amnesia in which patients forget his or her personal identity. Persons do not remember his identity. Narration to access his or her autobiographical past. As we were discussing earlier about the dissociative amnesia, the person was unable to remember the past or as Schachter was talking about the case where the person just lost the information.

This dissociative fugue talks about the person—the patient forgets not only their personal identity but also all the autobiographical events they have experienced. Dissociative fugue can therefore also be referred to as retrograde amnesia, where a person does not remember their past. One of the notable features of dissociative fugue is forgetting one's name, profession, place of origin, birthplace, and current residence. All this information seems to be compromised and impaired in such individuals. Now, amnesia, as we are discussing, does not have to be neurological in nature.

So, one such amnesia is related to a defense mechanism, which Sigmund Freud proposed in his 12 defense mechanisms. Here, the individual uses the concept of repression to block out access to memories that are traumatic in nature. Those events which seem to be

harmful to the individual. So, this individual tries to repress this information as a defense mechanism.

And that is why repression can be referred to as psychogenic retrograde amnesia. It's a selective event. One ought to put emphasis on the selective event. This event is very selective in nature. So, the view of repression is generally associated with Freudian theory, as we have discussed.

And here individual tries to do a motivated forgetting, tries to forget the information. Another form of amnesia is the post-traumatic stress disorder which is unlikely the other form of amnesia. Here, the person's trauma gets triggered by a number of stimuli. Here, the person's trauma is getting triggered because of the failure of inhibitory circuit to block the traumatic memory or the information.

So, here person is not having a loss of information but in fact, there is a trigger which is resulting into the, inhibit the unwanted memories. So, post-traumatic disorder or psychological disorder that includes the inability to inhibit the unwanted memories here. Let us try to summarize our understanding about the amnesia. While talking about the memory disorder, we discussed about the Korskov disease or Korskov syndrome where due to chronic alcoholism, individual develops an inability, formation of new memory and retrieval of old information is compromised. Psychogenic amnesia

People talked about not all forms of amnesia is neurological in nature. Some forms of amnesia are psychological. And when we talk about psychological, then we discuss about a case study, Lumberjack. And while discussing this case study, We also talked about how an individual tried to dissociate himself from the trauma.

As a result, the traumatic event, the memory related to the traumatic event seems not to be remembered or recalled. We even discussed repression, which is a form of defense mechanism proposed by Sigmund Freud along with other defense mechanisms, but repression is the motivated forgetting. Here, the individual tries to repress the unwanted memories and is successful in repressing that information. However, in contrast, post-traumatic disorder prevents the unwanted memory from being suppressed and

it reaches the surface with a single trigger. Any cue can trigger the traumatic memory in these individuals. With this, we end this session. And in the next class, we will continue our lecture on memory disorders. Thank you.