

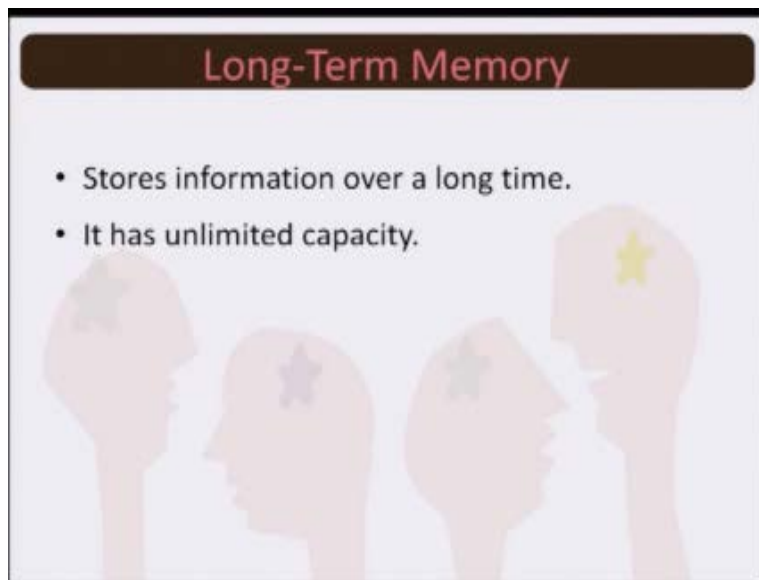
Indian Institute of Technology Kanpur
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Course Title
A Brief Introduction to Psychology

Lecture – 15
Memory

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Now that we have discussed sensory and short term memory, we would now exclusively focus on long-term memory. Long-term memory basically refers to the fact that the information is stored for a very, very long period of time.

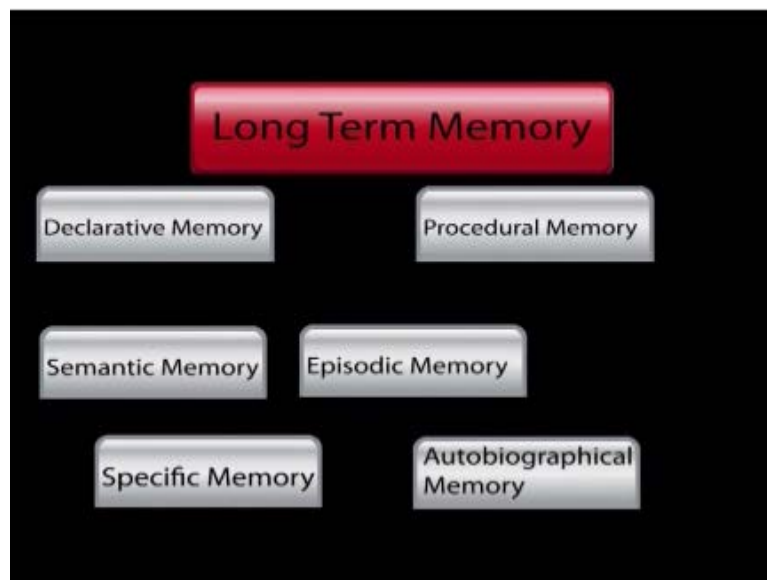
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Remember the terminal duration for short-term memory was thirty seconds. So if you are able to store the information and retrieve it even after the lapse of a 30 seconds time, that means the information has now travel to the long-term storage. In terms of sensory memory and short-term memory we did talk about the capacity, what would be the maximum capacity of this specific

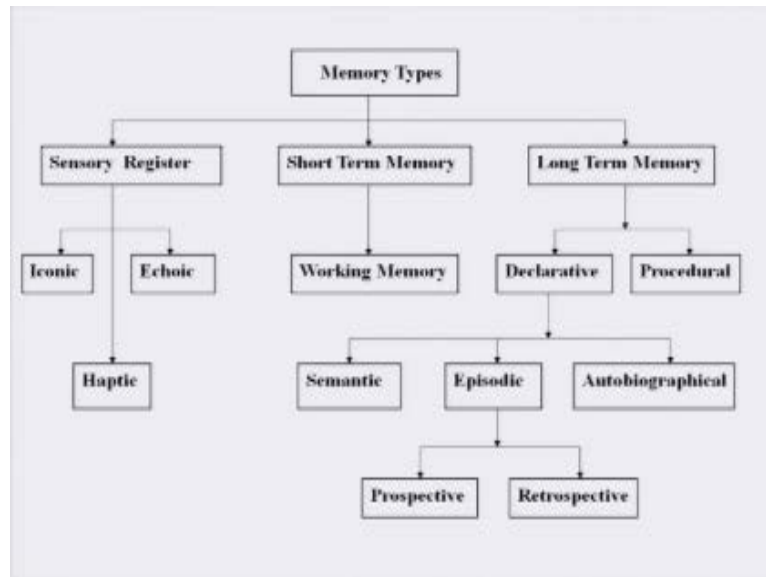
memory type? We said no 11 to 16 items in the case of iconic memory, similarly we said that fine no even if you try to chunk the information maximum of 40 bits of information can be stored in short-term storage, in terms of long-term storage there is no nothing like the maximum possible limit of the long-term storage. So unlimited storage for any period of time that is no, the most vital thing about long-term storage long-term memory.

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Now long-term memory can be of two types declarative memory and procedural memory and declarative memory can also be divided into semantic and episodic memory and further episodic memory can be specified as a specific memory an autobiographical memory. Based on the discussion that we had till now and if you add a little more to what you saw right now, we primarily divide memory sensory register, short-term storage and long-term storage.

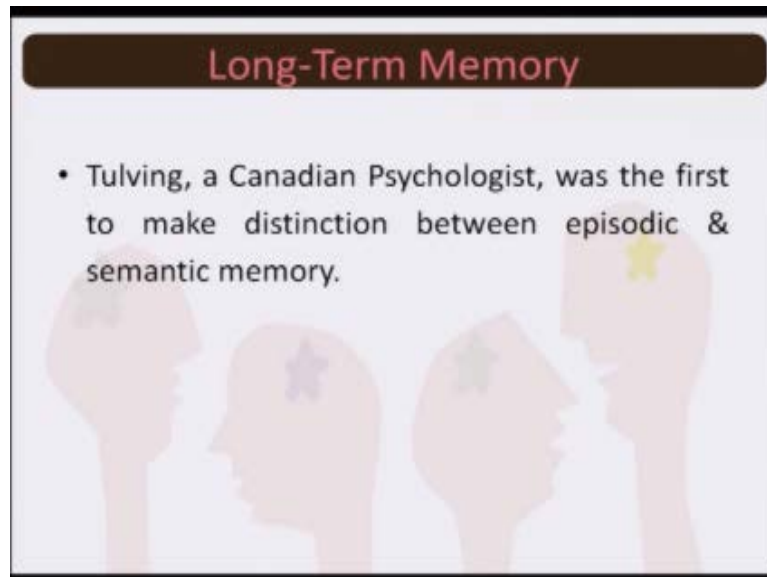
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Sensory memory we talked about no iconic and echoic memory and we did refer to Haptic memory saying that no is mostly iconic and echoic memory that has been well and therefore we talked about it at length within short term memory we also had a discussion about the working memory. Now long-term memory you can divide it into declarative and procedural memory this we will come to it little later.

The other when you look at memory in terms of semantic memory, episodic memory and autobiographical memory, further episodic memory can be divided into prospective and retrospective memory, what we would do right now is, that we will start with episodic memory and then we will move towards different, different other types of long-term memory that we are looking at in the chart right now.

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Canadian psychologist, Tulving was the first to make the distinction between episodic memory and semantic memory.

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Now if you look at the way information is stored and the way the information is recollected you will find very interesting thing about human beings, we have a very good memory for language we have a good memory for music we also have very good memory for voice, okay. Now memory of language would primarily mean the storage of the meaning rather than the sound, in terms of music information pertaining to contours and pitch interval both are found to be retained in our long-term storage.

And of course in terms of voice reasonably good was recognition is no possible for us when we come across familiar people but for strangers we do not have such good voice memory, say for instance if you hear the calling sound of your parents if you hear the calling sound of one of your siblings, okay. You would very easily find out recognized just on the basis of the voice that this is the calling sound of my father or my mother or my brother or my sister, okay.

Because we have a very good no memory for the voice of familiar people, listen to this very music.

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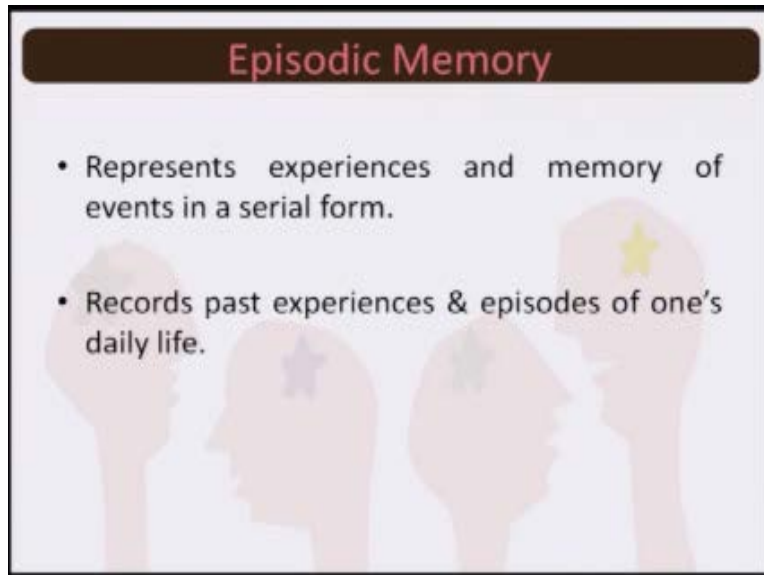
Look at the clip to see an actual attempt by your child to memories a poem. The video that you saw right now, presented to know mother her making her child learn to sing a nursery rhyme. Now child was basically picking up the contours, okay. And he was trying to copy the melody even though the exact word was not known to him and this was of course no meaningful for the mother but it had no meaning for the child except for he was enjoying the music the rhythm that she was trying to immediate.

Now after the lapse of this episode when the child was grown and the mother was asked to narrate some of the significant moments that she remembers about her own child, okay. She could exactly remember the words that this child used to use, see specially had a recollection about this very episode where insisted know that how the child used to sing and what type of words you used to use.

And how no he used to repeat, imitate the rhyme, okay. So this is a fantastic no, thing about the human memory system that we have very no very good recollection of the voices, the music, the language and depending on the personal significance of these issues, okay. Are memory becomes

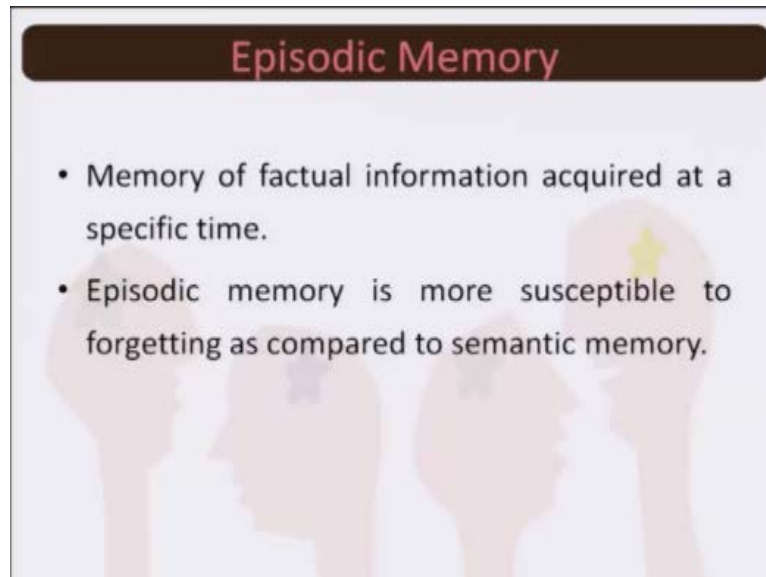
very, very, very, very good for these episodes. Now episodic memory represents experiences and it is basically a memory of events. But these events are recollected in a serial form.

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It just like a television serial which is broken into several episodes. So we have the record of our past experience, okay. And all these daily experiences of the past, they are broken into episodes. Therefore it is called as episodic memory. So when you recollect you say you I still remember no my first day in a school. I still remember when I delivered know the first lecture on camera okay these are episodic memory episodic memory basically also is the factual.

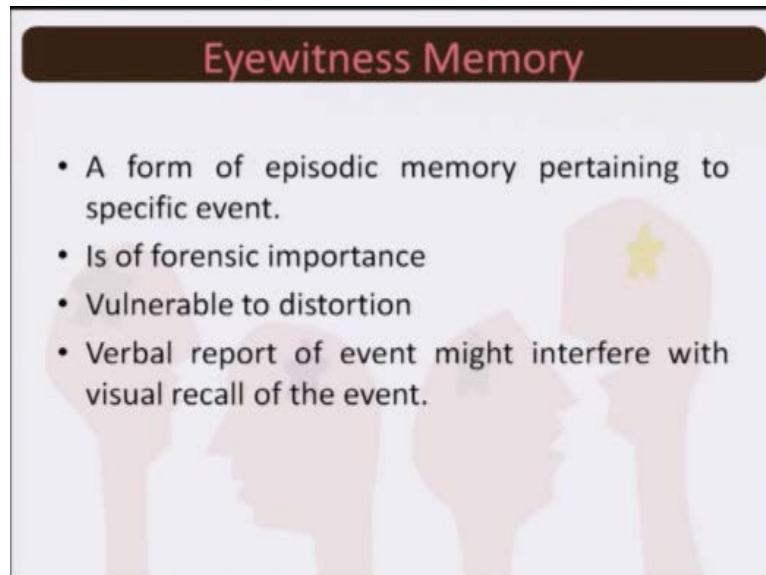
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Information that is acquired at a specific time, so remember time plays an important role here it becomes anchor here therefore episodic memory is more susceptible to forgetting as compared to semantic memory because in the case of semantic memory it is meaningfulness that which given an at most importance where as in the case of episodic memory it is the fact that at a specific time that is given importance okay.

Therefore even in terms of recollection we do commit certain errors right now we will see one of those examples if one is asked to recollect and reproduce factors related to a particular event that had happened at a specific time period we do go ahead with distorting it so part of it is recollection but we realize that whole lot of distortion does take place in recollection of episodic memory one form of episodic memory.

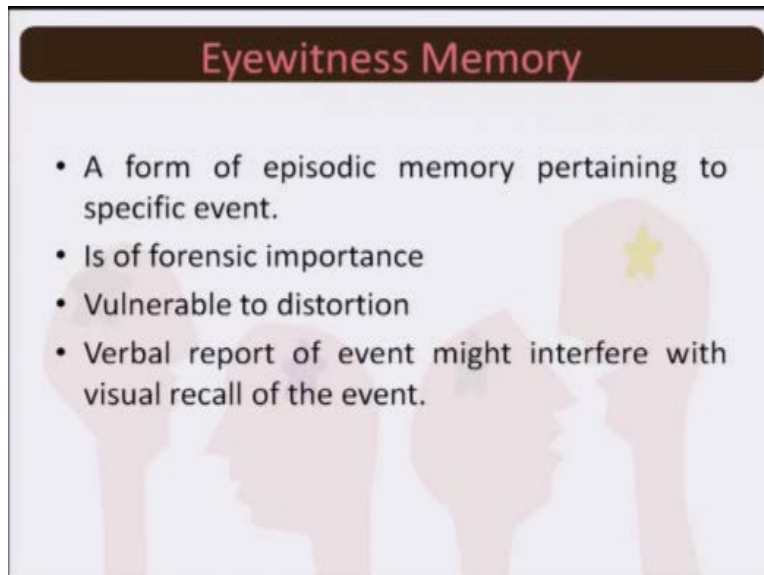
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Is called eyewitness memory it is called eyewitness because it has forensic importance okay you must have heard this word know that there is somebody who acts as a witness in the court of law so you provide an evidence okay you endorse of the happening of something okay therefore it is called know that you're testifying it you are becoming a witness to it so when recollection of the information okay which is basically an episode at a specific time period if it serves the forensic purpose then it is called eye witness memory and off course because it is one of the forms of episodic memory.

So it is also vulnerable to distortion usually the verbal report of the even it might even interfere with.

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A presentation slide titled "Eyewitness Memory" in a dark brown header. The slide features a list of four bullet points on the left and a background illustration of four human profiles in shades of pink and red. The profile on the far right has a yellow star on its forehead.

Eyewitness Memory

- A form of episodic memory pertaining to specific event.
- Is of forensic importance
- Vulnerable to distortion
- Verbal report of event might interfere with visual recall of the event.

The visual recall of the event so what you visual recall when you replay the event the sequence and when you verbally translate it to report it there could be a little bit of an interference effect there itself look at this very image on.

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Your screen imagine you are standing at one of the locations on the road and you see collision between two cars okay usually if two cars are moving at a very high speed the overall time that the entire process of collision will take place would be fraction of seconds not even one second would be complete when this car will actually come and hit each other and whatever had to happen would happen.

Now imagine yourself that you are standing at a specific location from where you saw this accident okay, so now focus yourself on the screen right now see what actually gets distorted okay.

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Now after the lapse of certain period of time you are asked to recollect what do you actually saw now you see.

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When you are construct when you mentally no replay this story what you saw was this okay but when you mentally replay you had certain flavor to it okay now.

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All these arrows show no these are the additions that you have made okay, so as to suit the recollection no making it much more accurate but while trying your best to make the story for more accurate actually what you have done is that you have distorted it okay this is an interesting aspect of eyewitness memory. November 26, 2008 would always be remembered in the history.

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Of India because of what is called as Mumbai attack or 26.11 when, Hotel Taj one of the sites in Bombay became the target of terrorist attack.

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November 26, 2008 now that this episode took place in hotel Taj let us now look at this even from two viewpoints an NSG commando who participated in this even okay in the anti-terrorist movement operation that was held in hotel Taj how he recollected information and somebody who was now part of it and got a chance to come out of the hotel how he recollecting the information okay this is pure demonstration of episodic memory.

That specific time when you were in hotel Taj performing the commando operation okay what happened to you listen to this.

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29 years old Sunil Kumar Yadav an NSG commando belongs to Pataudi in Haryana. Mr. Amit the manager of Shamiyana.

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Restaurant in hotel Taj also was a witness of this episode okay his episodic recollection where is from recollection of the commando whom you heard right now because although times was the same the episode that was taking place for Amit was different from what took place for the commando listen to what I Amit had to say later on.

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So I went out side, there is a corridor.

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As it one end and the terrorist saw the there. Since started he looked at me started shooting, guys screamed and I try to move I from there, he threw a hand grenade on, actual have those noise that noise you know it bounce right behind me just three feet distance I jumped screamed and I jumped and I knew that found I am going to be died.

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But my luck so strong and hand grenade never blast at me I came back I told the couple that your son going to find trust me.

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You know this person started bleeding very heavily, my boss gave me open the door he came out of the transformer room, immediately the tops van was stopped, we took the guest to Bombay hospital. You know whatever my life the Wednesday onwards, 26 onwards is grace life, now let us take as I was day on 26.

Besides hotel Taj CST station in Bombay also was one of the sides where the terrorists had attacked and killed lot many innocent people. Sebastian Desuza, the photo journalist was available at that time. He was present there, he clicked numerous photographs and it was through the lens of Sebastian Desuza.

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Sebastian Desuza
Photojournalist at CST station

That next morning a whole lot of Indians they realize what actually happened at CST station. Now when Sebastian Desuza was taken back to CST station and was asked to recollect the episode that took place that evening this is what he had to say.

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We are taking lot many examples because we want to understand how episodic memory know works, remember one thing we have discussed that it is time a specific. Two we have discussed that it is event specific, so event anchored to a given time okay, and then you stored because of the significance that you attribute to it. These are all rare examples know, the example of terrorist attack that we took all of them where rare, one such rare experience I will also like to show it to you. On 22nd May 2010, at 6:30 in the morning Air India Express flight.

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812 from Dubai to Mangalore meet an accident at Bangalore International Airport only eight passengers survived, two of them later on recollected their experience, look at this.

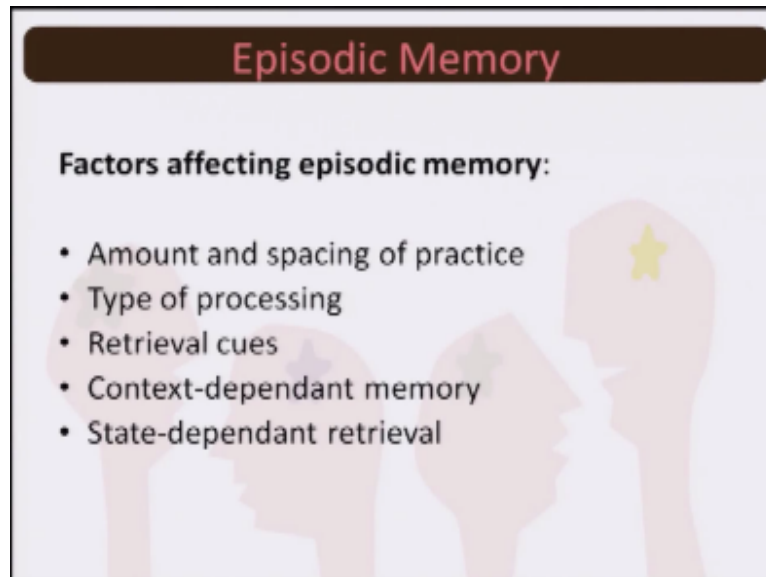
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Now what you actually saw here was know, amazing, the way the two passengers who had every narrow escape who defeated death could know actually recollect the tittle of the flight, know the jerked at the fled when the flight know did hit the ground and what actually happened, they were sitting inside the flight and they usually know, they recreate the whole sequence of events. What actually would have happened there? Okay, these are examples of episodic memory and of course these were all examples we all know, because they were historic events from the history point of view.

But you recollect your own life experience and you would realize that you have thousands and thousands of such episodic recollections, because you provide certain specific significance to it. Therefore the whole lot of factors that affect episodic memory, first one of course is the significance of the event, besides that amount in the space of practice.

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How much amount of practice has actually gone into storing this very information okay. If you have practice something more and more okay, the chances are that you would recollect it better. If there are no competing events temporarily two significant events take place at the same time what is the temporal gap between the first and second event that would also play a role.

If both are equally significant and temporary there is not much of a difference there could be interference. If there is distribution pattern one event took place at this time, the other event took place little later, then you get time and space okay, to practice this information and now reserve it in the episodic memory.

Second very important thing is the type of processing okay, you heard Mr. Amith right now, when he said towards the end of his interview that the life after 26, 11 is a grace period for him, this is how he interprets. So how do you process the experience that is important okay, the way you process will decide how much of recollection you will have and the level of accuracy with which you will be able to recollect the information.

Three and more important is also the fact that how do you know cue the information that you are storing. It is equivalent to something like no giving up file name when you save a file in your PC okay. Say for example, if now if I have an event okay. Say for example, today's date, I give it as a file name and I know that my search will always be know using the date. So if I have to find out what happens at this point in time, I just search for the file name that has to do with this date.

There could be a situation if I know, give file name not by date, but by event okay. So if I have a seminar, whether I have a class, whether I am going for some other invited talk, I give different file names okay. Similarly say I am sure, when you store photographs on your PC, you create a folder and you give name to the folder. So say for example, if you have gone to say any tourist place, say you went to Agra you make a folder named Agra, you came to Kanpur and you give a folder name Kanpur okay.

Photographs of Agra are stored in on the folder Agra; photographs of Kanpur are stored in the folder named Kanpur. And this is relevant cue that you are giving to yourself, because next time if you have to look at the photographs that you know, clicked in Agra you will go for know, the folder which has the name Agra.

So all episodes okay, whether it is the code that you give is the time, and you say I remember when I was at CS decision in the evening at this time waiting for this very train okay, which has the departure time at this say, 6'o clock okay. And 5:58 was a time when this accident took place, when this episode took place okay.

So this works as a retrieval cue better and more efficient the retrieval cue far more know, better it would be and convenient it would be for you to recollect the event. Also the information, the recollection will be very, very accurate, because retrieval cue is correct, of course we have been talking about significance.

So episodic memory is bound to be context dependent okay, in which context did this happen okay. So when you recollect the information in what context are you trying to recollect the information? So if there is a match in the context in which it was stored and in which you are

trying to retrieve more and more is the match between the contexts, higher is the probability that you would recollect it better. And of course besides context it is also the state which plays a role okay. So retrieval of episodic memory is also a state dependent.

In what mood state you are okay, when you experience this. So you were at a given point in time on this station when the terrorist attack took place, and when you recollect the experience it is also the state in which you are okay. So the emotion, the emotional arousal at your experience at that time, later on when you are about to do you are told to recollect your emotional arousal also plays an important role okay. Experience the emotional experience at that time and emotional experience at this point in time okay, how charge you were there at that point in time, and how know, charge you are at this point in time.

If these two overlaps okay, it will work as a fantastic retrieval cue okay. So what we have discussed, event is specific, time is specific. So event at a given time okay, recollected as one segment forms the episodic memory okay. We have seen good number of examples of episodic memory. The time of practice, the space between two events that takes place, how much of processing, how we try to store the information, the file name that we try to give, and of course the state and the context in which the event happen and which the recollection is being made. So these are the prominent factors that affect episodic memory.

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