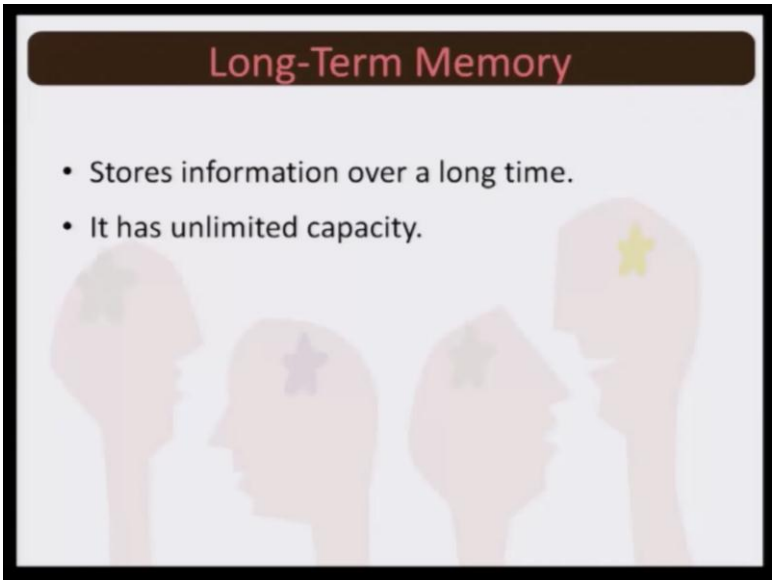
Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 19
Memory Long term Memory – Episodic Memory

Now that we have discussed sensory in short term memory we would now exclusively focus on long term memory.

(Refer Slide Time: 00:27)

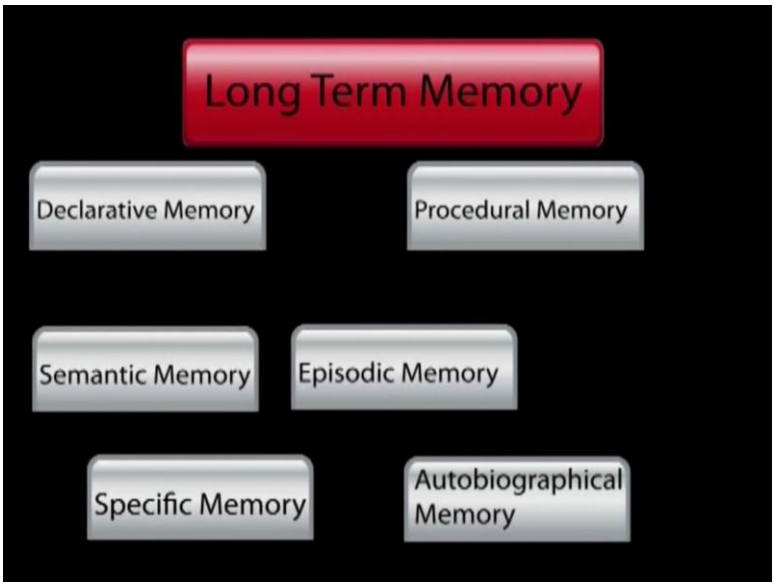


Long term memory basically refers to the fact that the information is stored for very very long period of time. Remember the terminal duration for short term memory was 30 seconds. So, if you are able to store the information and retrieve it even after lapse of 30 seconds time that means, the information has now traveled to long term storage. In term 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 11 to 16 items in the case of iconic memory, similarly we said the even if you try to chunk the information at maximum of 40 bites 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

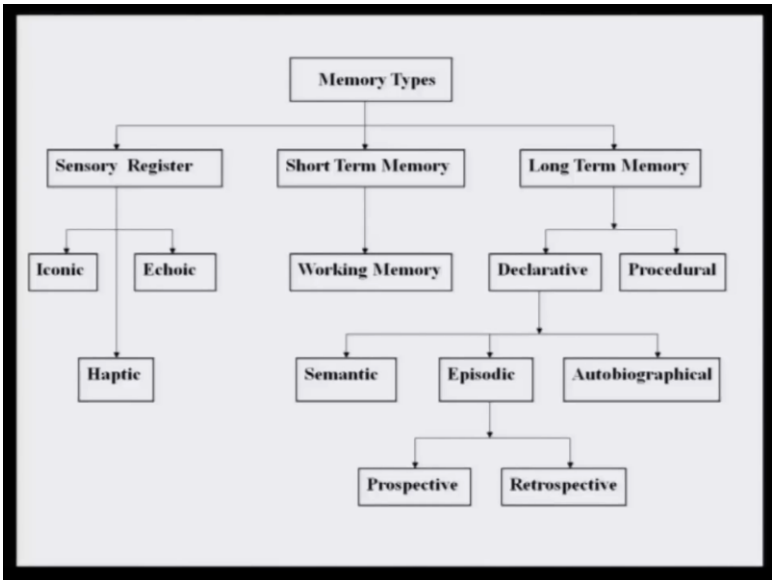
long term storage, unlimited storage for any period of time that is the most vital thing about long term storage, long term memory.

(Refer Slide Time: 01:41)



Now long term memory can be of two types' of 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 specific memory and autobiographical memory. Based on the discussion that we had till now and if you add little more to what you saw right now.

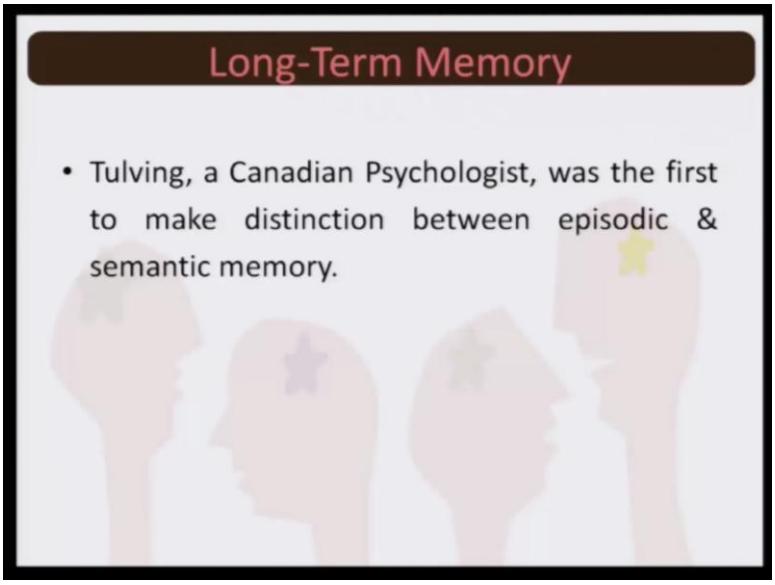
(Refer Slide Time: 02:21)



We primarily divide memory into sensory register short term storage and long term storage. Sensory memory we talked about now iconic and echoic memory. And we did refer to haptic memory saying that now mostly iconic and echoic memory that has been researched well and therefore we talked about it at length. Within short term memory we also had the discussion about the working memory.

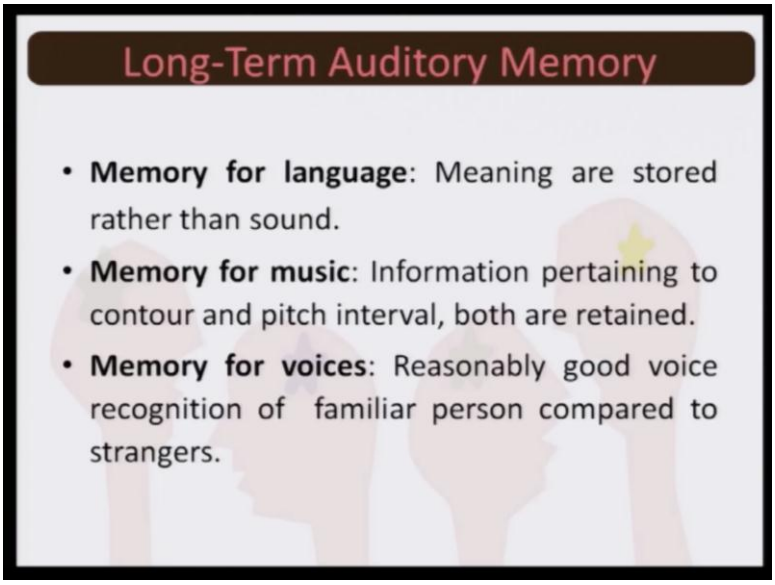
Now, long term memory you can divide it into declarative and procedural memory this we will come to it little later. The other when you look at memory in terms of semantic memory, episodic memory and autobiographical memory. Further, episodic memory can be divided into prospective and retrospective memory. What would we do right know is that we will start with episodic memory and then we will know move towards different different other types of long term memory that we are looking at in the chart right now.

(Refer Slide Time: 03:11)



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

(Refer Slide Time: 03:19)



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 very good

memory for language, we have very good memory for music, and we also have very good memory for voice.

Now, memory of language would primarily mean the storage of the meaning rather than the sound. In term of music information pertaining to controversy and pitch interval both are found to be retained in our long term storage. In terms of voice reasonably good voice recognition is 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, you would very easily find out recognize just on the basis of voice that this is the calling sound of my father or my mother or my brother or my sister, because we have very good now memory for voice of familiar people. Listen to this very music.

(Refer Slide Time: 04:45)

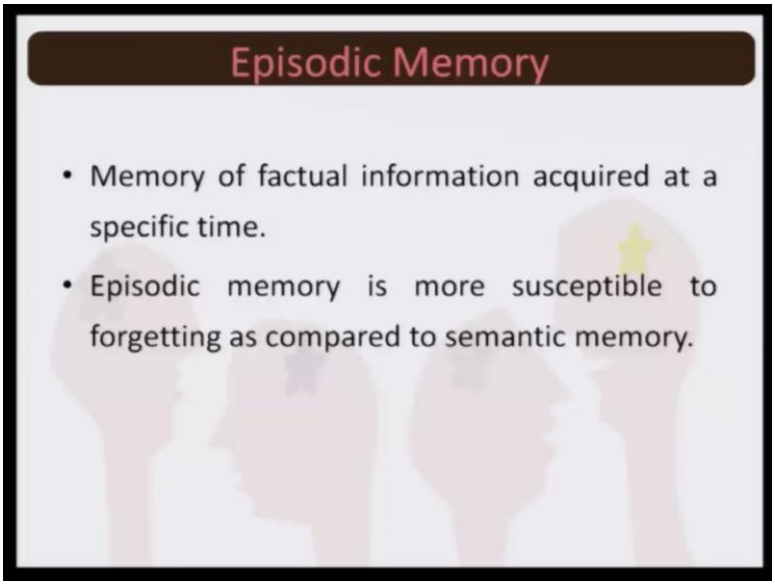
Look at the clip to see and actual attempt by a child to memorize a poem. The video that you saw right now presented mother making her child learn to sing a nursery rhyme. Now child was basically picking up the contours and he was trying to copy the melody even though the exact word was not known to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

Now, after the lapse of this episode when the child was grown and mother was asked to narrate some of the significant moments that she remembers about her own child, she could exactly remember the words that this child used to use. She has specially has the recollection about this very episode wherein she said that how the child used to sing and what type of words he used to use and how he is to repeat imitate the rhyme.

So, this is fantastic thing about the human memory system. We have know very good recollection of the voices, the music, the language and depending on the personal significance of this issues our memory become very very very very no good for this episodes. Now episodic memory represents experiences and it is basically memory of events, but these event are recollected in a serial from. It is just like a television serial which is broken into several episodes. So, we have the record of our past experience 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 I still remember my first day in school. I still remember when I delivered the first lecture on camera; these are episodic memory.

(Refer Slide Time: 08:20)

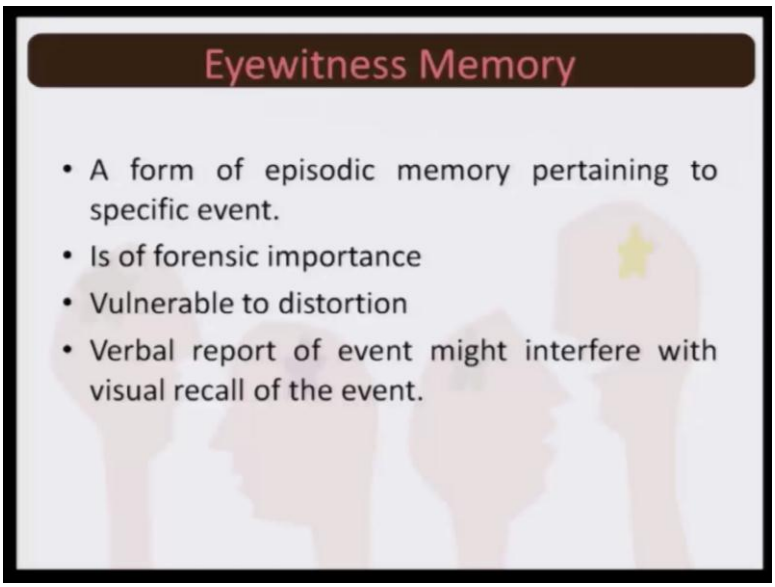


Episodic memory basically also is the factual information that is acquired at a specific

time. So, remember time plays an important role here, it becomes an 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 is given utmost importance, whereas in the case of episodic memory it is the fact at specific time that is given importance.

Therefore, even in terms of recollection we do commit certain errors. Right now we will see one of the those examples; if one is asked to recollect and reproduce fact related to particular event that had happen 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.

(Refer Slide Time: 09:29)

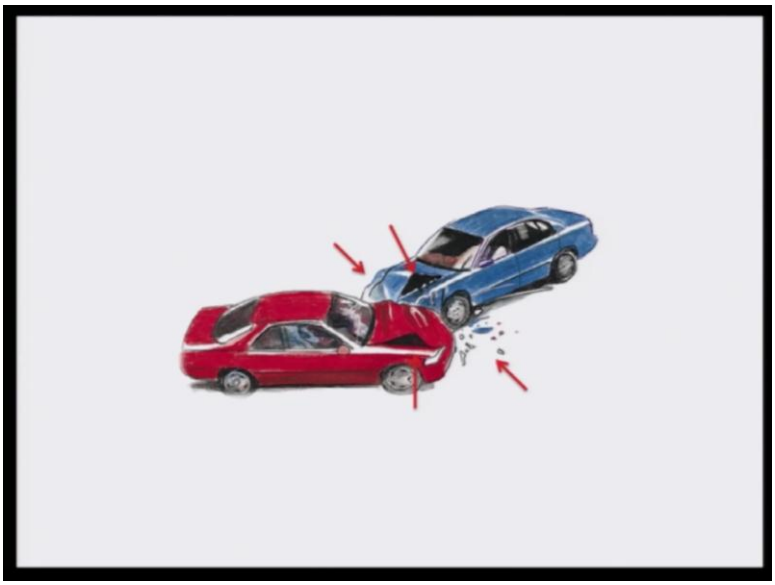


One form of episodic memory is called eyewitness memory, it is called eyewitness because it has forensic importance. You must have heard this word no there is somebody who acts as a witness in the court of law. So, you provide evidence, you endorse of the happening of something therefore it is called now that you are testifying it you are becoming a witness to it. So, when recollection of information which is basically an episodes act a specific time period if it serve the forensic purpose then it is called Eyewitness Memory. And of course, it is because one of the forms of episodic memory

so it is also vulnerable to distortion.

Usually, the verbal report of event might even interfere with visual recall of the event. So, what you usually recall when you replay the event the sequence and you verbal translate it to report it there could be little bit of a interference effect there itself

(Refer Slide Time: 10:40)



Look at this very image on your screen, image you are standing at one of the locations on the road and you see collision between two cars. Usually, if two cars are moving at a very high speed the overall time that the entire process of collision takes place would be fraction of seconds not even one second would be complete that this car will come and hit each other and whatever would had to happen would happen.

Now, imagine yourself that you are standing at a specific location from where you saw this accident. Focus yourself on this screen right now, see what actually gets distorted. After the lapse of certain period of time you are asked to recollect what you actually saw. Now you see, when you construct when you mentally replay the story what you saw was this but when you mentally replay it you add certain flavor to it. Now all this arrows show no this are the addition that you have made so as to suit the recollection make it much more accurate, but while trying your best to make this story far more accurate

actually what you have done is it you have distorted it. This is an interesting aspect of eyewitness memory.

(Refer Slide Time: 12:23)

November 26, 2008 would always be remembered in the history 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.

November 26 2008; now, that this episode took place in hotel Taj let us look at this event from two viewpoints; an NSG commando who participated in this event in the anti terrorist movement operation that was held in hotel Taj, how he recollects the information. And somebody who was part of it and got a chance to come out of the hotel, how he recollects the information. This is pure demonstration of episodic memory. That specific time when you were in hotel Taj performing the commando operation, what happened to you listen to this.

(Refer Slide Time: 13:45)

Mr. Amit the manager of Shamiyana restaurant in hotel Taj also was a witness of this episode. His episodic recollection varies from recollection of the commando whom you heard right now, because although time was the same the episode that was taking place for Amit was different from what took place for the commando. Listen to what Amit had to say later on.

Besides hotel Taj CST station in Bombay also was one of the sites where the terrorist had attacked and killed lot many innocent people. Sabestian Dsouza the photo journalist was available at that time, he was present there he clicked numerous photographs and it was through the lens of Sabestian Dsouza that next morning whole lot of Indians they realized what actually happen at the CST station. Now when Sabestian Dsouza 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.

We are taking lot many examples because we want to understand how episodic memory works. Remember one thing we have discussed that it is time specific, two we have discussed that it event specific. So, event anchor to the given time and then you store it because of the significance that you attribute to it. These are all rear examples now, the example of terrorist attack that you took all of them where rear.

(Refer Slide Time: 20:24)

Once like rear examples I also like to show it to you on 22nd May 2010 6:30 in the morning Air India Express flight 812 from Dubai to Mangalore met an accident at Mangalore International Airport. Only eight passenger survive; two of them later on recollected there experience look at this.

Now, what actually you saw here was amazing. The way two passengers who had a very narrow escape who defeated death could no actually recollect the tilt of the flight, no the jerk that they felt when the flight no did hit the ground and what actually happened. They were sitting inside the flight, and they visualized, they recreated the whole sequence of events what actually could have happened there. These are the 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 would have thousands and thousands of such episodic recollections, because you provide certain specific significance to it. Therefore the whole lot of factors affects episodic memory. First one, of course the significance of the events; besides that amount and space of practice, how is amount of practice has actually gone into storing this very information. If you have practice something more and more the chances are that you would recollect it

better. If there are competing events temporarily two event significant events take place at the same time, what is the temporal gap between first and second event that would also play a role. If both are equally significant and temporarily there is not much of the difference there could be interference. If there is distribution pattern, one event took at this time and other event took place little later then you get time and space to practice this information and reserve it in the episodic memory.

Second very important thing is the type of processing. You heard Mr. Amit right now when he said towards the end of his interview that 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? The way he process will decide how much of recollection you will have and the level of accuracy with which you will be recollect the information.

Three and more important is also the fact that how do you cue the information it was storing. It is equivalent to something like giving a file name when you save file in your PC. Say for example, if I have an event today's date I give it as a file and I know that my search will be always be now using the date. So, if I have to find out what happened 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 give a file name not by date, but by event. If I have a seminar, whether I have a class, whether I am going for some other invited top give different file names.

Similarly, say I am sure when you store photographs on your PC you create a folder and you give name to the folder. For example, if you have gone to say any tourist place, say you are going to Agra you make a folder name Agra. You came to Kanpur and give a folder name Kanpur. Photographs of Agra are stored in or the folder Agra, photographs of Kanpur are stored in the folder name 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 clicked in Agra you will go for the folder which has been named Agra.

All episodes whether it is the quote that you give is the time and you say I remember when I was at CST station in the evening at this time waiting for this very train which has the departure time at say 6 o clock and 5:58 was the time when this accident took place, when this episode took place. So, this walks as a retrieval cue. Better and more

efficient the retrieval cue far more the better it would be and convenient it would be for you to recollect the event. Also information the recollection will be very very be accurate because retrieval cue is correct.

Of course, we have been talking about significance. So, episodic memory is bound to be context dependent. In which context did this happen. 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 them the context; higher is the probability that you would recollect it better. And of course, besides context it is also the state which plays a role. So, retrieval of state memory is also the state depended.

In what mode state you are when you experience this. So, you were at a given point in time on the station when the terrorist attack took place and when you recollect the experience it is also the state in which you are. The emotional arousal that you experience at that time later on when you are about to you are told to recollect your emotional arousal also plays an important role. Experience, the emotional experience at that time the emotional experience at this point in time; how charged you were there at that point in time and how charged you are at this point in time. If these two over lapse, it will work as a fantastic retrieval cue.

So, what we have discussed, event specific time specific; so event at a given time recollected as one segment forms the episodic memory. We have seen good number of examples of episodic memory. The time of practice, the space between two events that take 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 event happen and in which the recollection is being made. So, these are the prominent factors that affect episodic memory.