Indian Institute of Technology Kanpur
National Programme on Technology Enhanced Learning (NPTEL)
Course Title
A Brief Introduction of Psychology

Lecture – 17
Memory

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Till now we have talked about episodic and semantic memory which is basically part of the declarative memory it is also called as explicit memory.

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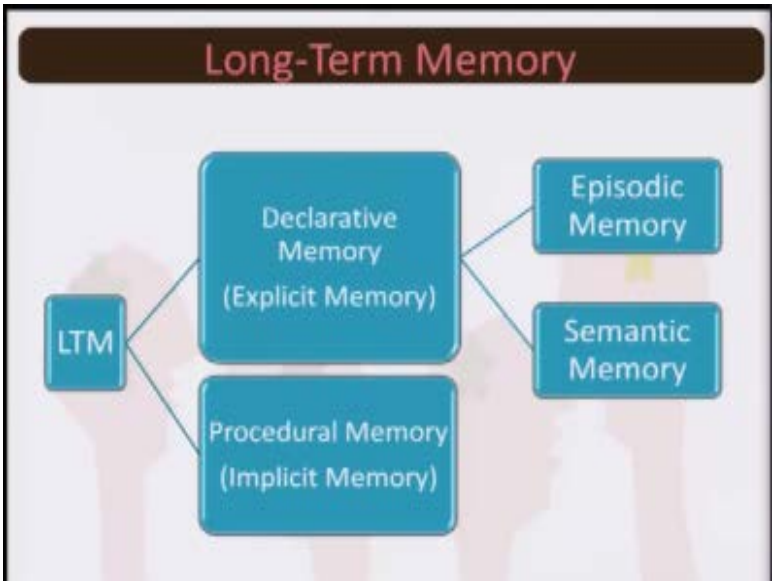

Let us now come to the implicit sight of the memory what is called as procedural memory.

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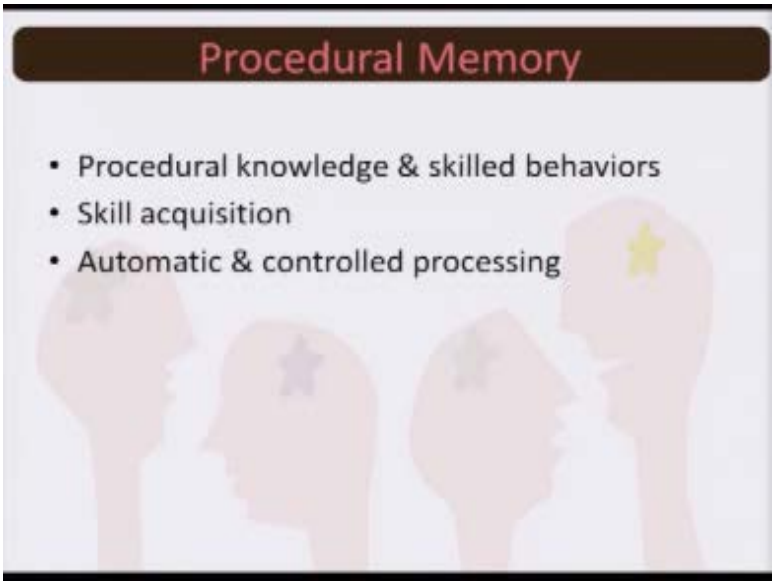

Procedural memory basically constitutes the knowledge of the procedure and the skilled behavior. So when we acquire a skill and gradually we realize that the whole process that we have learned for a particular type of an operation becomes too automated okay. And we have developed a control, we have developed a mastery over the process okay, that is called procedural memory okay.

Now declarative memory from that point of view if you see, if they are basically what of the facts okay, and the events.

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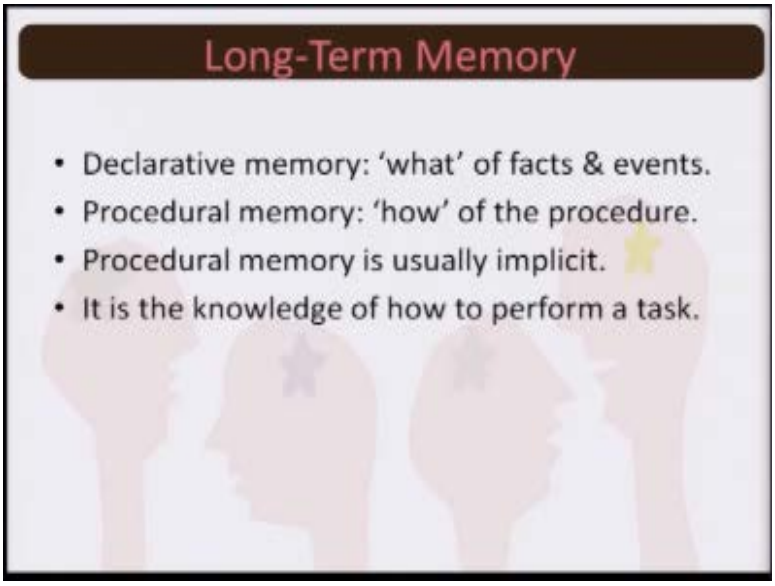

Whereas procedural memory it basically denotes how of the procedure, and therefore procedural memory is usually implicit in nature. You must have now seen many, many events in your life where you perform the task and you remember the full mechanism, as to how to operate it. Say for example, cycling, riding a bike okay or running a computer okay, whole of these mechanisms you would realize that there are steps, a series of steps know.

And all these steps has to be religiously followed in sequence, if you want the mechanism to work appropriately okay. But then it is now so, so, so nicely know acquired by you that these intermediate steps, the transition between the steps none of these things you remember know, you realize as if things are know, getting done automatically this is called procedural memory.

Let us look at this very video to see how our medical technician actually performs a task meticulously, although he knows what the apparatus is, he known now what the concern doctor has asked this technician to perform, or rest all involves whole degree of no movement of knobs, fixing the machine, taking out the output of the machine okay, have a look at this.

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Now that we have 34 to understood the explicit and the implicit sight of the memory. Let us now look at another aspect of long-term memory what is called as prospective memory. Prospective, something which is about to come.

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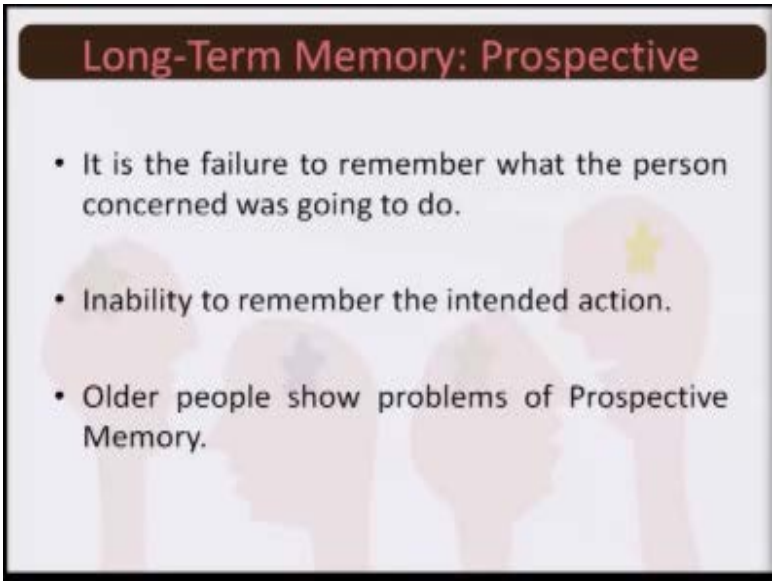

So if a person fails to remember what he or she was going to do, so say for instance I intend to go and switch on the light, I leave my table go towards the switchboard and halfway if I forget what I thought that is loss of prospective memory know. So the inability to remember the intended action okay, is what is called as prospective memory. Older people usually they show this problem of prospective memory.

In our young days adulthood usually we do not have this type of problem, unless we are too busy and we are into multitasking then it might happen, because of competition between two thoughts which are going parallel. Else even in the case of at least older people even if they have a one single thought, one single prospective is stemmed that they had plant to execute, there might be a problem in terms of inability to recollect what he or she was intending to go and do.

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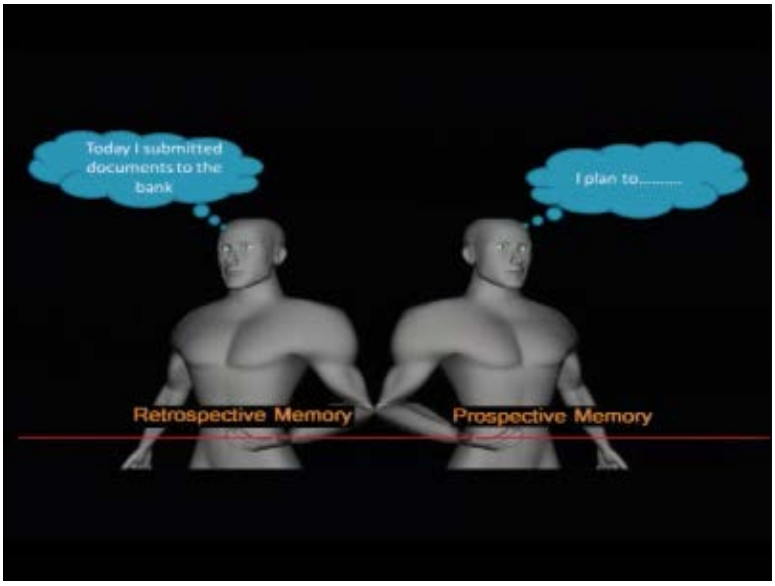

So this very image represents know what actually retrospective and prospective side of memory would be. Now retrospective memory, if you think that today I submitted documents to the bank, you have already performed the task and you remember okay. Prospective memory would be I plan to okay, and you have planned something what exactly you planned okay, half way while trying to execute it you forget it, that is the loss of prospective memory, it is mostly seen in elderly people.

Having now understood since very short-term and long-term memory, let us once try to compare between these three systems of memory. We will try to compare these three structures of memory on certain criteria's. So on this screen when you see know in the white.

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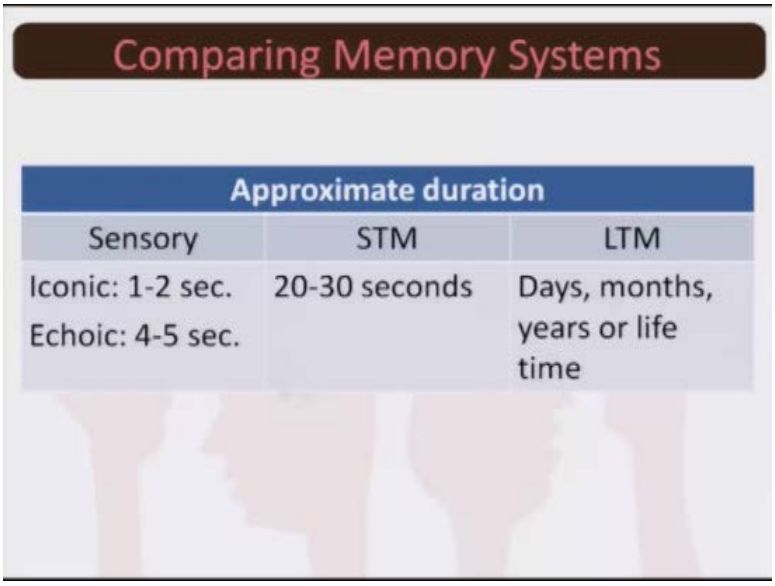

Front the word written there is the criteria on which the three memory systems are being compared, so first let us compare memory system in terms of their approximate duration sensory memory we discuss that the duration is 1-2 seconds for iconic memory and 4-5 seconds for echoic memory this experienced sustain sully it was up to 20- 30 seconds on et case of short term memory.

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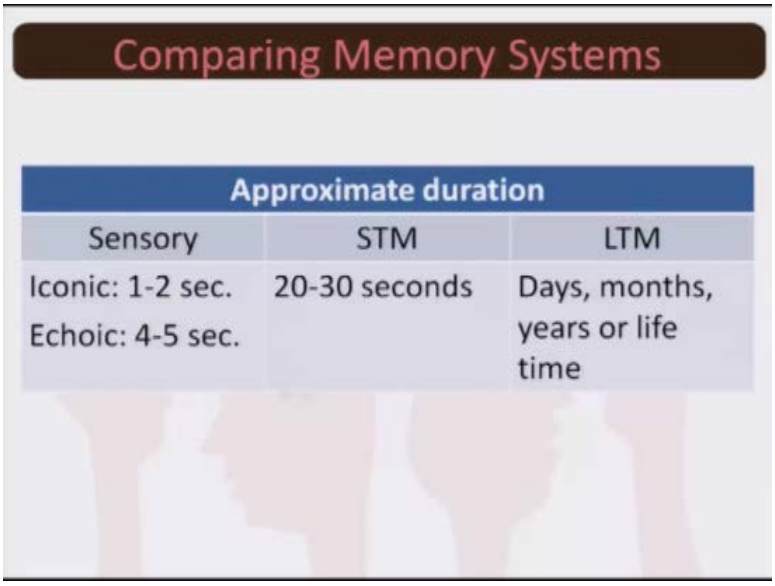

And in terms of long term memory it could be days months it could be even life time okay so something that starts from one second up to life time this is the hole expansion up to first 5 seconds part of sensory memory up to 30 seconds it is short term and there after it is long term.

In terms of capacity we realized that sensory memory also has a relatively large no capacity in terms of storing information and at least.

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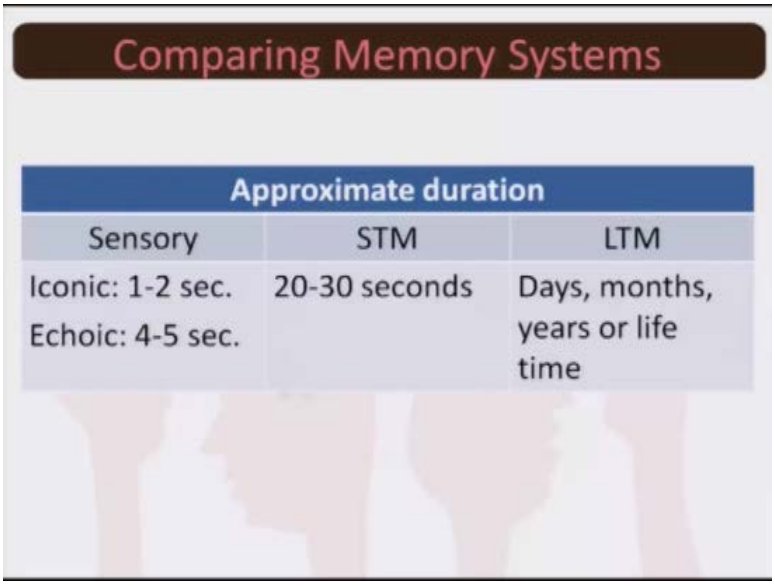

16 items can be stored at the level of sensory memory okay and probably little more can also be done. Short term memory from that point of view given the time it has okay we realize that capacity is relatively small but this capacity increases meaningful if the items are divided into chunks okay and depending know whether you form a chunk of three or you chunk form chunk of four items approximately up to 40 items can be stored in the short term memory.

Long-term memory it is very large okay and the limit is just not known any and everything can be stored then we come to transfer in memory okay in terms of transfer.

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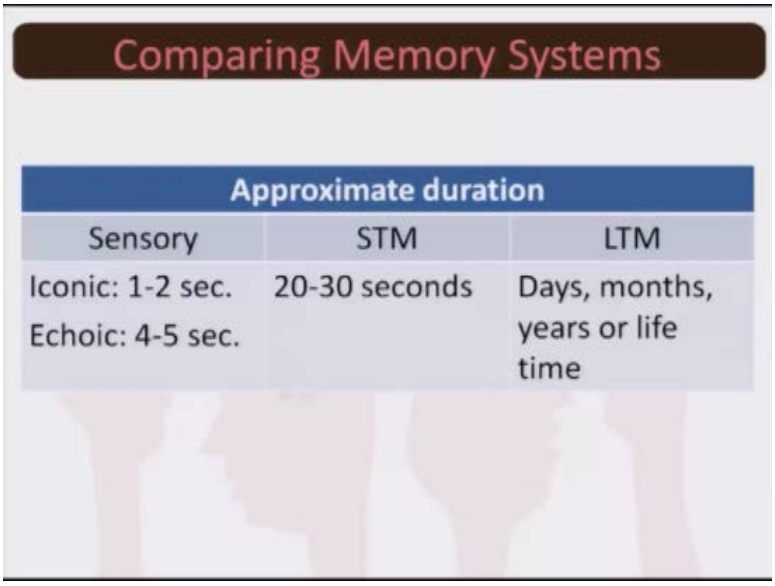

We have no the long-term memory were transfer is not at all need because information is already stored there it has nothing to do beyond that but in case of sensory memory attention and recognition they play an important role items that are attended to and items that are recognized they have the likelihood of moving towards the short term storage okay items which you do not pay attention to and items that you failed to recognize okay they will not be now forwarded to the short term storage.

In case of short-term we did discuss this fact also that there are two types of types rehearsal know the maintains rehearsal and the elaborative rehearsal know depending on rehearsals the item's are appropriately forwarded to the long-term memory now we come to the type of information.

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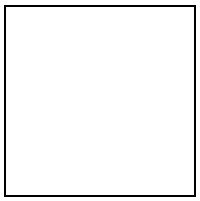

That is restored in case of sensory memory it is exact copy of the input that is a stored in the case of short-term it can have sounds, visual images, words and sentences okay long term memory has the fantastic thing know long-term memory primarily has the meaningful sentences life events concepts images okay right now we discuss semantic and episodic memory so hole of this becomes the part of long-term memory.

In terms of inability to recall information from long-term if you consider no reasons for information loss in sensory memory decay of trace has been considered as important reason why information is lost. In short-term it is the.

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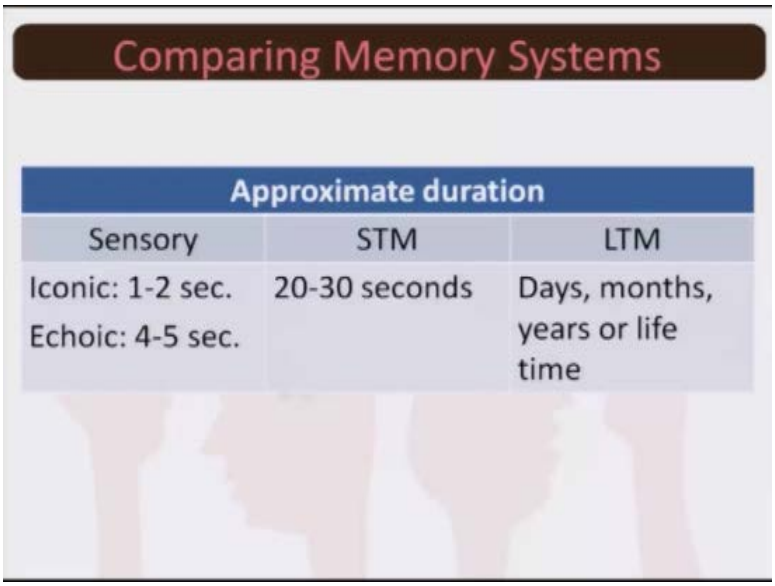

Displacement of the old information okay by the incoming information but in the case of long-term memory it could be faulty organization it could be inappropriate retrieval strategy or it interference okay so two information's if they compete against each other to be recollected this could lead to interference okay you have given the file a memory and you search by file name emotion you will not get the information no.

So inappropriate retrieval strategies being used or if because you know that information is stored in an organized order go for a random search okay you are not able to retrieve the information so this could be the possible reasons of loss of information from long-term storage there are two more interesting things about memory we will talk about one right now the reconstructive aspect of the memory.

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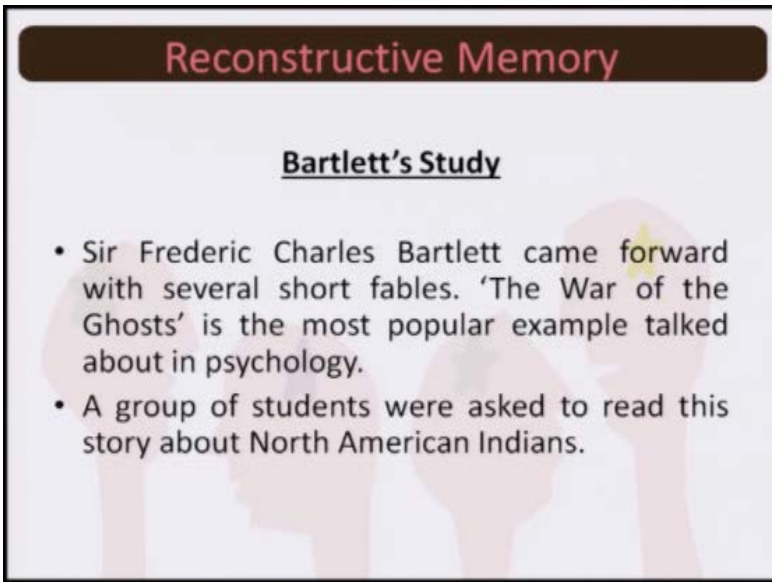

Sir Frederic Charles Bartlett okay performed a very interesting experiment what he did was that story was narrated to a group of students titled the war of the ghosts okay and then the story was supposed to be reproduced by these students who had actually heard it what Bartlett was able to prove was that story when it was reproduced after passing through several mouths.

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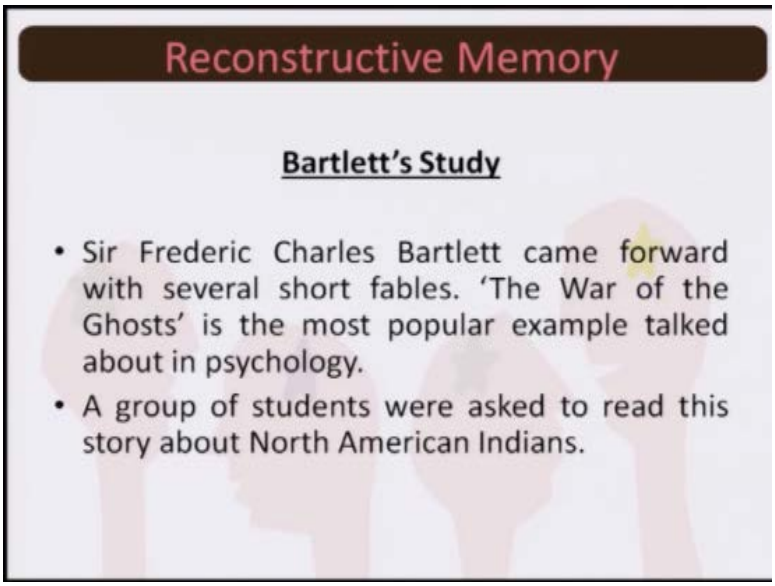

Underwent series of reconstructions and almost all details related to the American Indian culture were omitted and several others were rationalized when students try to recollect the story reconstruct the story what was very also interesting was that.

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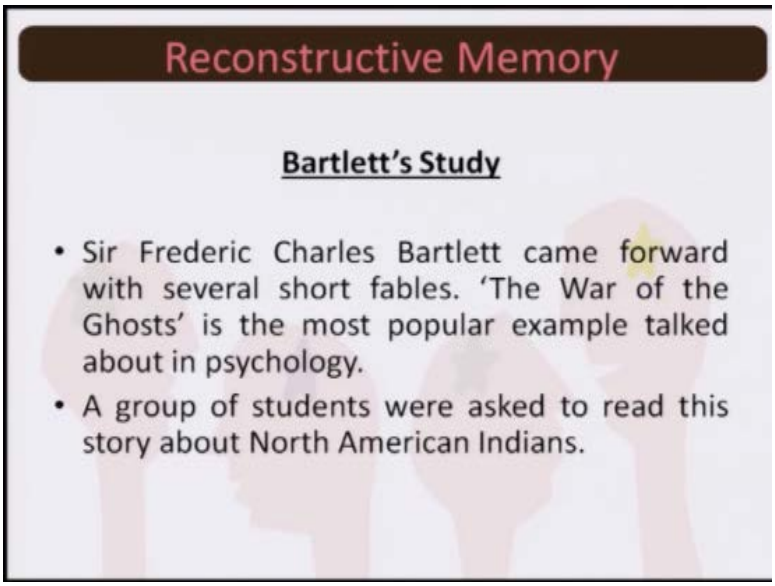

Each narrator added something to this story okay based on his or her own imagination okay few details of the story was leveled, making it very, very simply some other factors very exaggerated and therefore what happened finally this story got changed in this entire process Bartlett said that this is reconstructive memory why because something that you heard of okay and when it is transmitted from no our mouth to mouth the whole episode gets reconstructed no several things are leveled several things are exaggerated several things are downplayed and therefore the original content and the later contained undergoes a big difference.

One very interesting example I would like to quote from one of the Indian studies by J.P. Das and.

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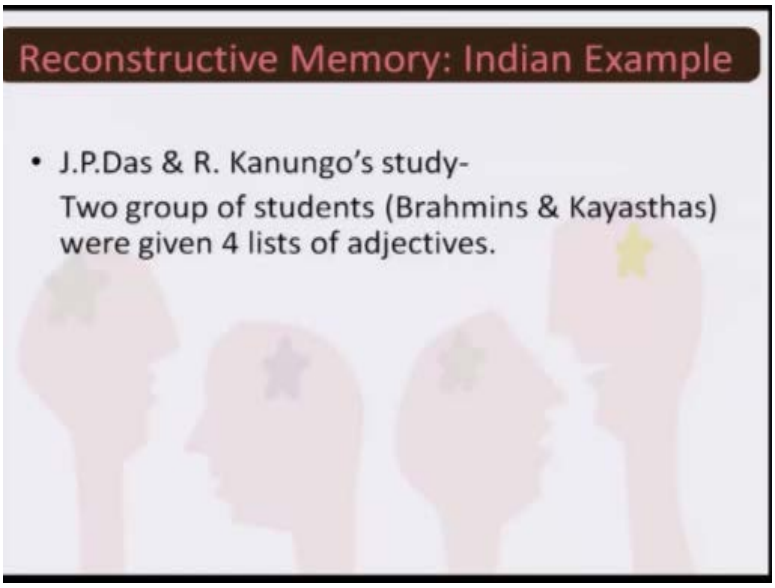

Rabindra Kanungo they conducted very interesting study were two groups of students who belong to two dominant caste in the country Brahmins and Kayasthas they were given for lists of the first list of adjectives okay the fist list had adjectives describing Brahmins in favorable terms like nice.

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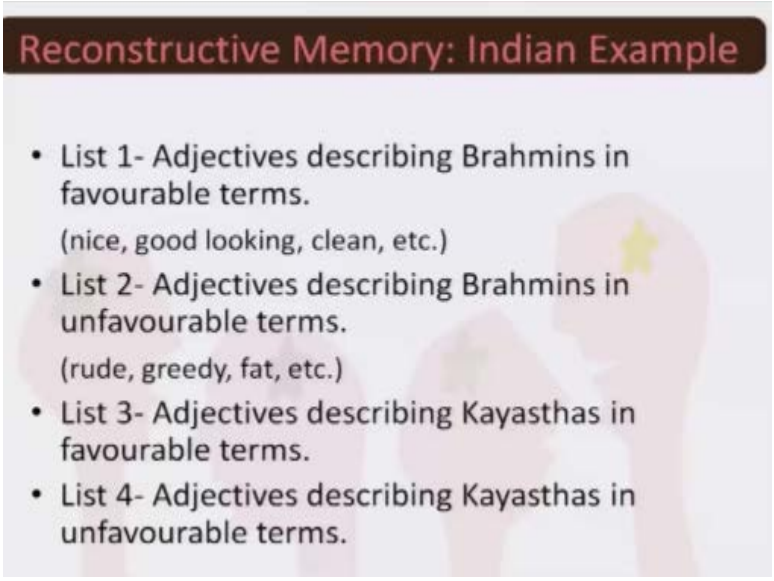

Good looking, clean and so on. The second list had adjective describing Brahmins in unfavorable terms like rude, greedy, fat and so on and the same thing was done for the Kayasthas, list three had adjectives describing Kayasthas in favorable terms and list four describe in unfavorable terms. Now when these Brahmins encourage their students who were supposed to no recollect the content.

Everyone remembered more unfavorable adjectives than the favorable ones and based on this J.P Das and Rabindra Kanungo, they inferred that people prefer to remember bad attributes rather than good ones. One a interesting thing which is also talked about in introductory psychology is an effect called Zeigarnik Effect.

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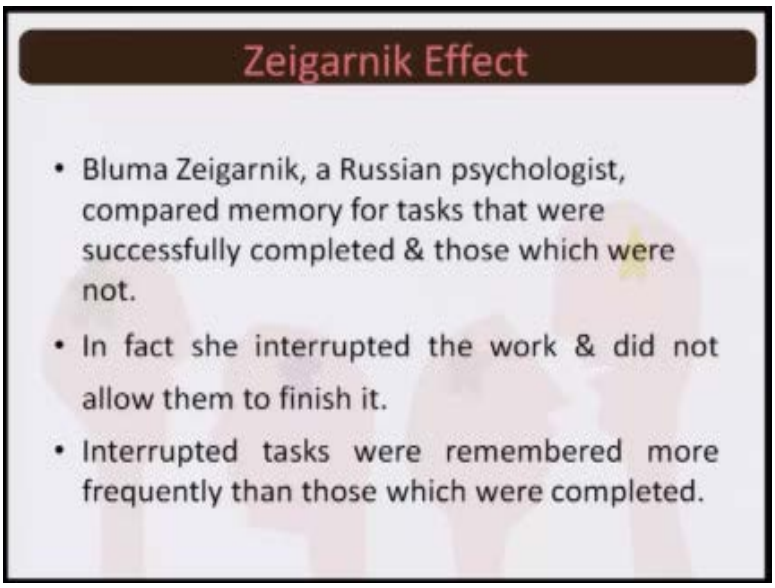

Bluma Zeigarnik was a Russian psychologist who actually compared memory of tasks which you are able to complete. And compared it with the task which you are not able to what she did was, she basically interrupted the work and did not allow the participants to finish the task, okay. What she finally found out and what is now called as Zeigarnik effect is, that interrupted tasks where remembered more frequently than those which who are able to complete, okay.

So things that you are not able to complete you would remember it more. Now this might mismatch with our daily life experiences, another interesting study again by Rabindra Kanungo along with data they give an interpretation to the Zeigarnik effect, they said that the intensity of the emotion.

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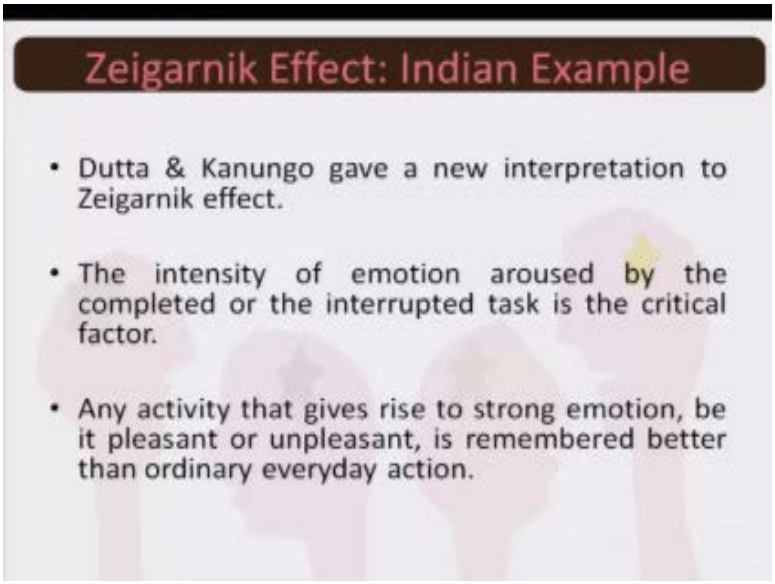

That is induced by the complete or the interpreted task that becomes a critical factor, okay. So it is not the task per say but the emotion that it leads to. So any activity that gives rise to a strong emotion, okay. Whether it is pleasant or unpleasant that does not matter, the fact that the activity gives rise to a strong emotion such events will have better memory, okay. You remember right now we had said no in our previous lecture.

That things which has an element of surprise things which has personal significance, okay. And things which induces great degree of emotional arousal in you those things have better chances of getting recollected, okay. So this was the explanation given by the Thai Kanungo as to why Zaigarnik effect works. Another interesting thing that is also talked about in memory is memory construction.

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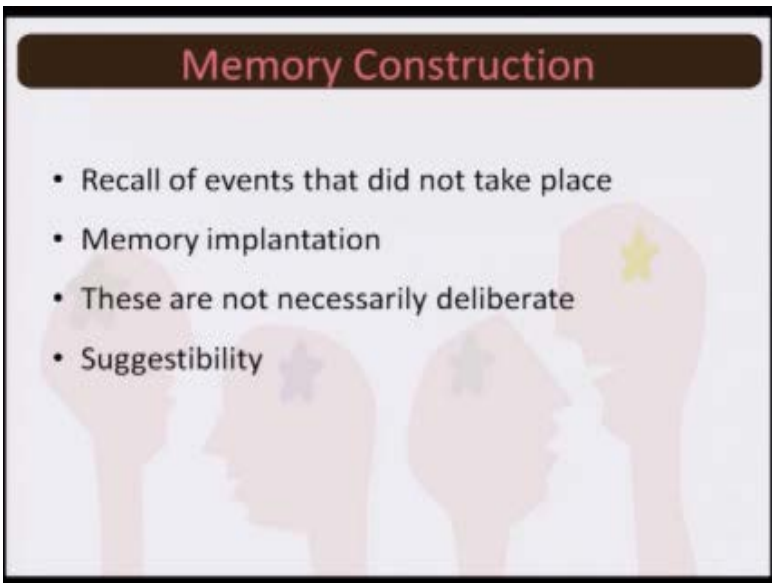

Butley Hebrew that there is reconstruction in memory, construction of memory has basically to do with no the experiences that was gathered in the clinical setup where memory is implanted and therefore the participants recall events of their life which had actually not happened, okay. Now this depends on the suggestibility of the participant. Certain type of content is implanted into your memory, okay.

And you are supposed to recollect it. So when you recollect know your life experiences you try to recollect even those events which actually you did not experience what you were told that this is how things had happened with you, okay. This is called memory construction. This type of memory modification, okay.

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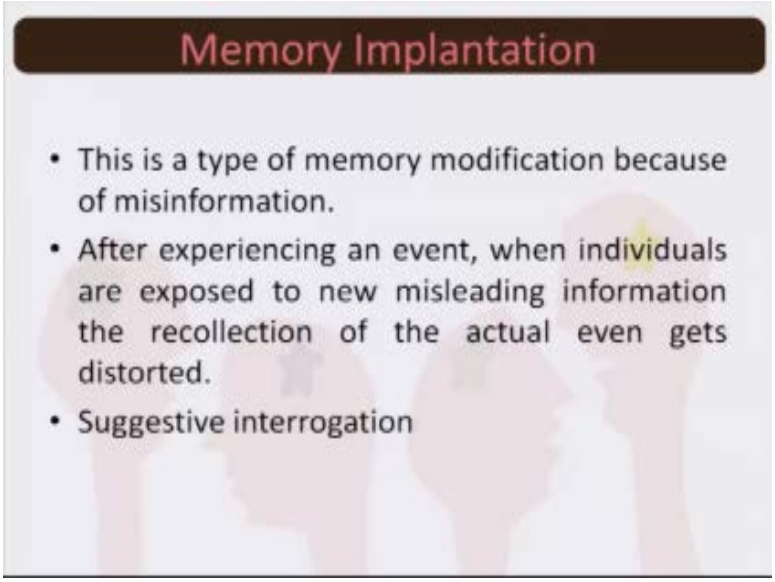

Basically takes place because of the misinformation, okay. And after experiencing an event when individuals are exposed to new misleading information the recollection of the actual event it get distorted, okay. And this is something that sometimes is also witnessed in interrogation what is called as suggestive interrogation, okay. So if an officer interrogates a suspect, okay. And new deliberately no ask questions.

Which has lead answers no, for example if I asked you, were you present there in that very building at that time? That is a question which ask you to declare whether you were present or not and you have an option of saying, that fine I was not present in that very building, think of the other situation when I say. So when you were in building what actually happened at that time?

You are not given the opportunity to declare that I was not available in the building, okay. The question is based on the premise that you were actually present in the building belly and then it no goes beyond that asking you what actually did you see inside the building, okay. This is an example of suggestive interrogation, okay. Therefore this is a misinformation the fact that you are not present in the building is not taken into account.

But then a misrepresentation allows know the whole construction of the new sequence of events and therefore it is called as constructive memory. Now we come to what is called as memory distortion.

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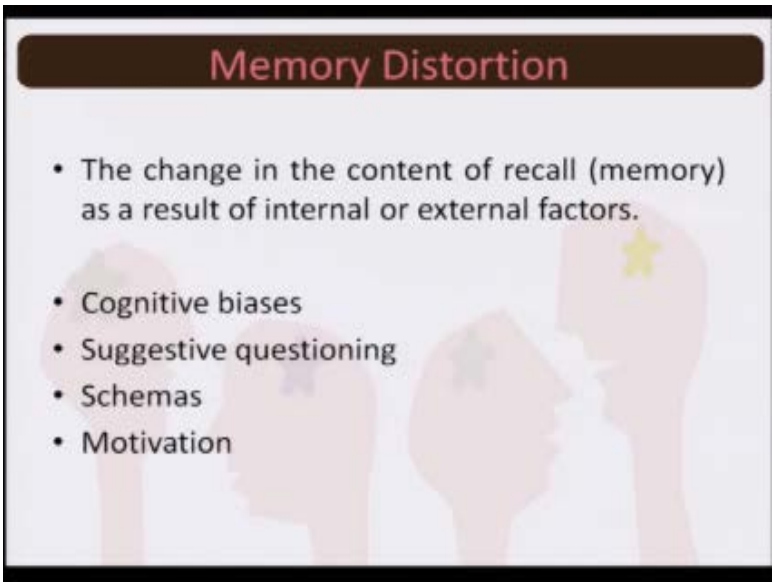

Remember we are still not talking or forgetting, forgetting will be our last lecture with respect to this very topic on memory. Now memory distortion basically the change in the content of the recall, okay. As a result of internal or external factors. So there could be cognitive bias, ,okay. You have a bias which does not allow you to remember good things about somebody about whom you have a negative feeling, okay.

So for example if you do not appreciate someone all good things told about that very individual, okay. Because of your bias you are not able to remember, okay. Say for example right now we took the example of suggestive interrogation, if you go for suggestive questioning, okay. The question that I ask suggest gives a cue to you as if what is expected out of you, what type of response should you give.

This is suggestive questioning, okay. This is bound to distort the memory, okay. Plus the schema no how the representation of the world that you have made in your mind, the mental representation, that might be important in terms of better recollection, accurate recollection or distortion and how motivated you are to recollect the information that would also play an important role. So let us now talk about the methods that are predominantly used for studying the process of memory. Four important methods we would talk about today.

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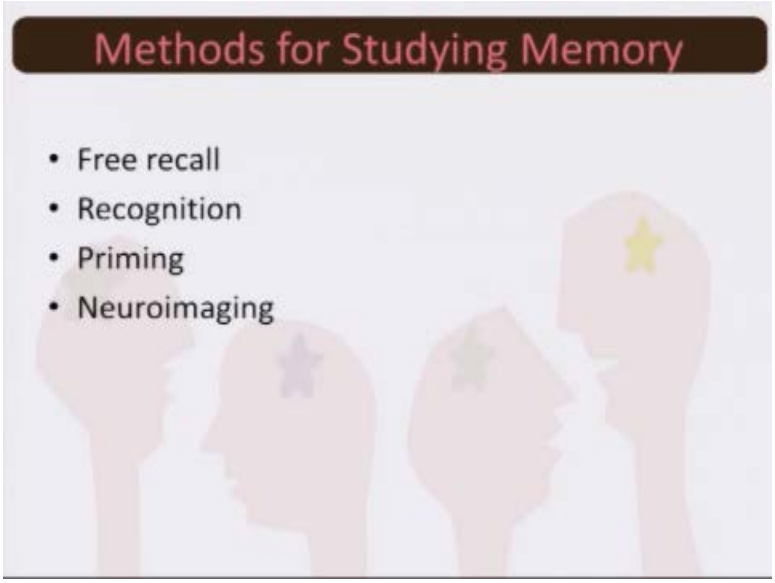

Free recall, recognition, priming and neuroimaging, the recent phenomena that you find is the dominant uses of neuroimaging technique, we are in the brain scans are used to identify which regions of the brain are involved in the memory of what kind of information. Let us first begin with free recall, free recall as you can know make out from the word itself it is a recall.

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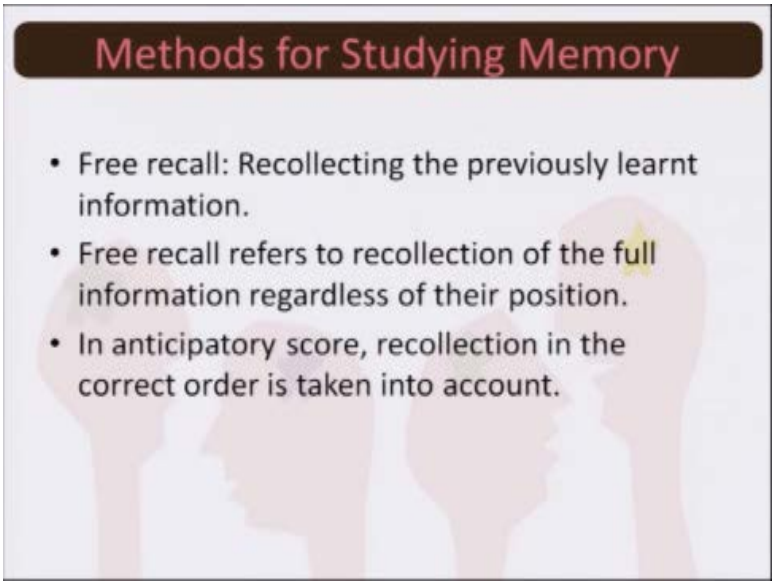

That is a recollection of the learnt information in a free order okay, this means that you are free to recall the information okay, regardless of the position of the event. You remember, we had talked about the serial position event know the primacy and the recency effect. So free recall basically means that you are suppose to recall the information regardless of its position. We have talked about serial position event, the primacy and the recency effect. Now if I give you a list of items and then tell you that you have to recollect information in the order in which it was presented to you.

So say for example, if I give you a list of items that you have to procure from the market and I say that these 15 items have to be recollected in its serial order, so first item should be recall first, second item for the at the second order, third item at the third order you would realize that usually people commit much of an error in terms of recollection okay, and that is what is called as you know recall where we have the serial position effect, where we have the primary, primacy and the recency effect.

But free recall usually is now considered as one of the good methods, because you do not have to worry about the relative positioning of the information, rather you have to simply recollect the

information. Now in anticipatory score, recollection in the correct order is taken into account okay, but free recall would basically means that you regardless of the position, you just recollect the information and accordingly know you get a score for that, so that that is one of the dominant methods in studying memory. The second important method for studying memories recognition and that is one of the most generously used techniques now-a-days.

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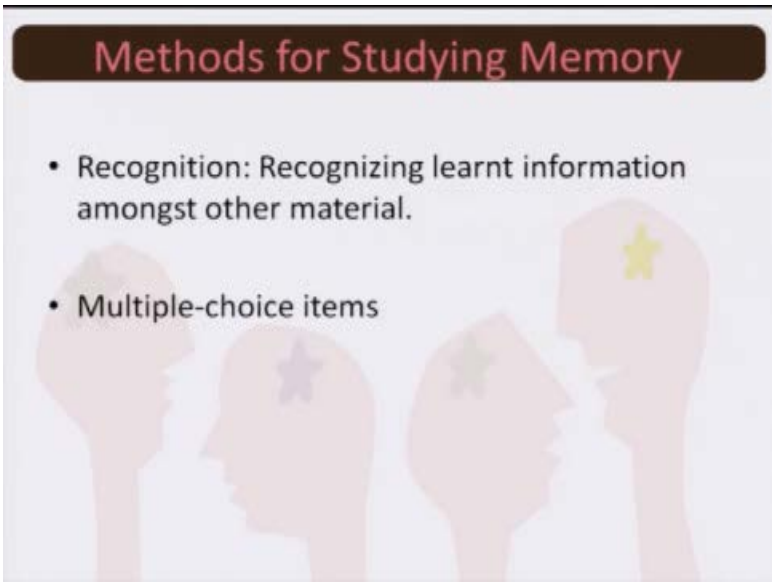

Even for this very course when we will come to evaluation okay, you will come across multiple choice items know, so when you are suppose to recognize the learnt information which is no hidden among other items okay. So you have the question written on the top and then you have four options, only one answer is correct and rest of the three are false information, so when the actual information is the hidden among, amongst other information and you have to recognize, that this is the correct answer, this is what I have learnt, this is called as the method of recognition okay, multiple choice items is the best example of it. The third an interesting method of studying memory is priming, now in case of priming how.

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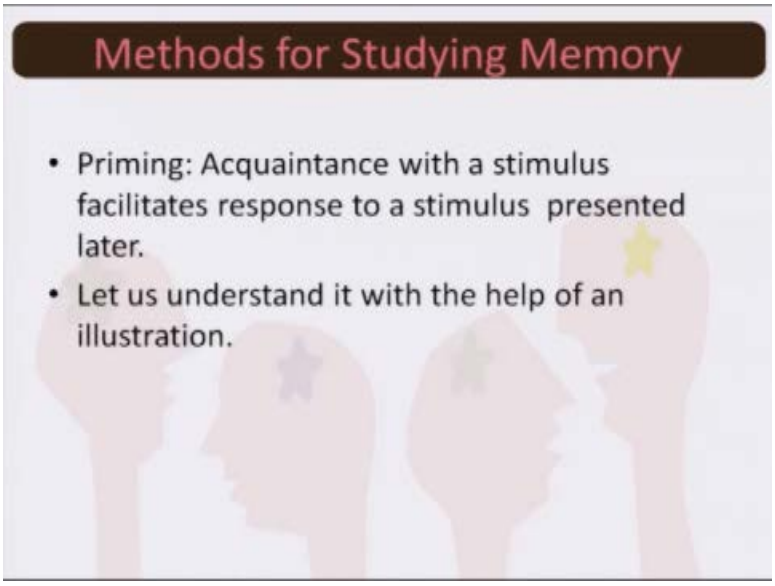

Acquainted you are with the stimulus that is important, so what happens acquaintance with a stimulus it basically facilitates your response to the stimulus which is presented later. Now let us understand this with the help of this illustration.

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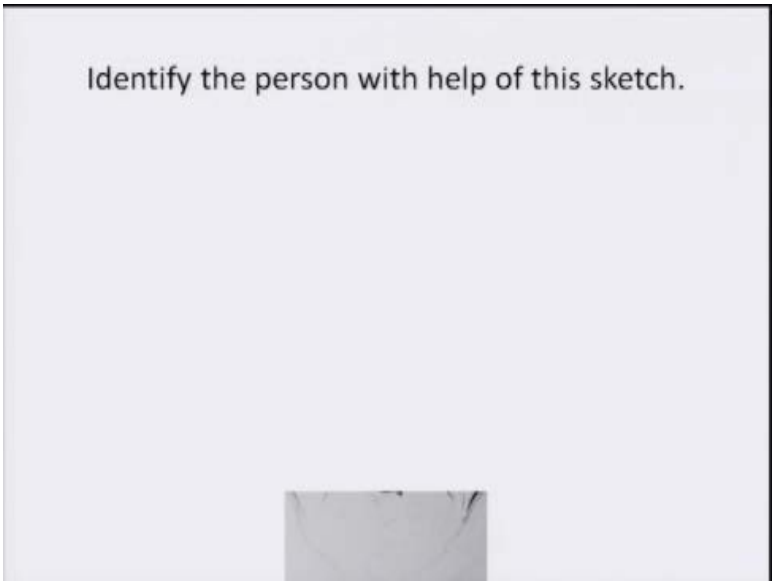

Now I asked you that look at your screen and based on sketch that you see at the bottom of the screen, identified the person okay, and I am sure none of you would be able to identify the person.

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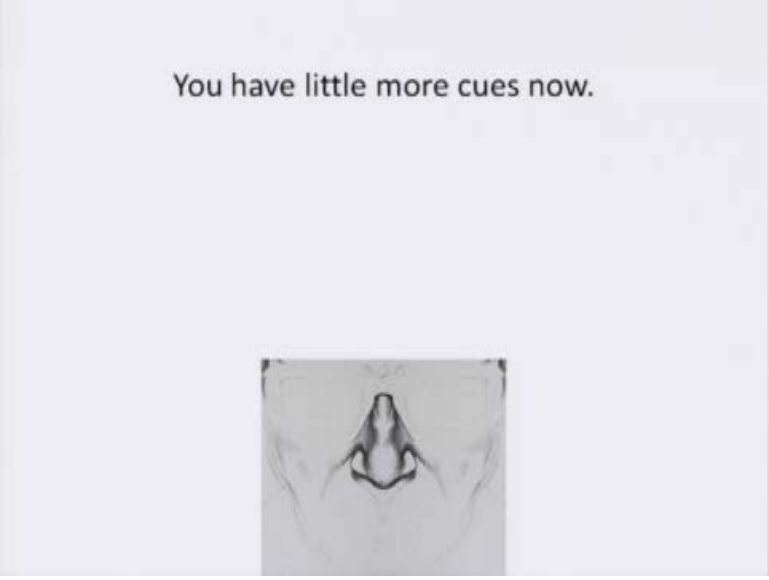

I had a little bit to it, and I say can you now identify the person given that you have a little more cues. Perhaps, some of you might make a guess.

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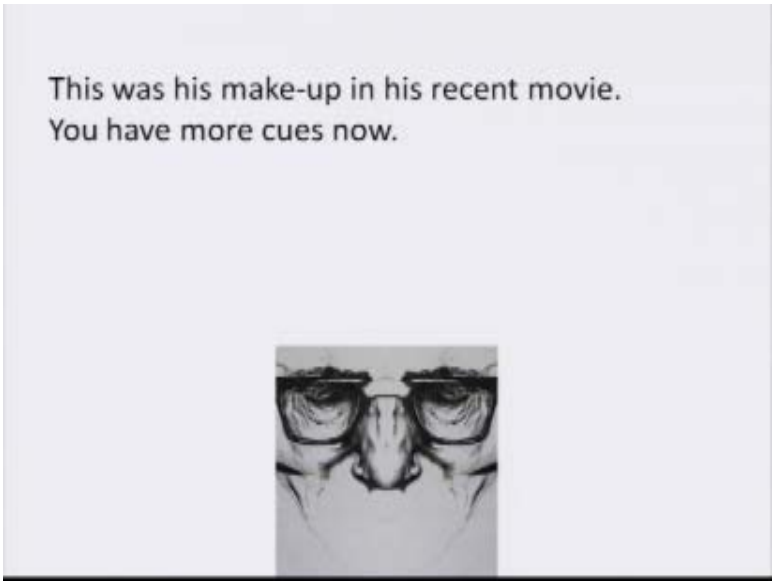

I had little more and I say, I know that very recently no use so one of his recent movies which had this very character can you now identify whom you are looking at.

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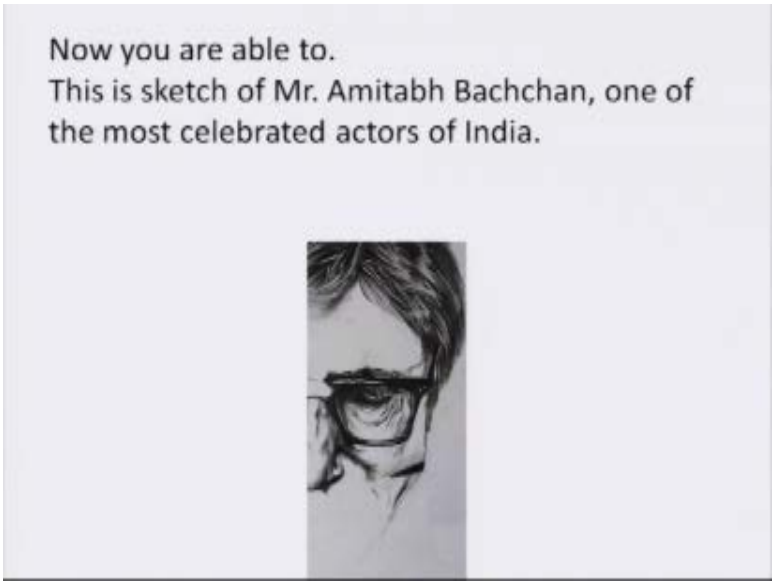

And now when you see half of the face okay, you said it Oh I know him, he is the most celebrated actors of Indian cinema Mr. Amitabh Bachchan okay. This is priming technique okay, so what actually happens here okay, you are acquainted with the character okay. You were presented with part of the information and depending on how well acquainted you are with the facial features okay, you would have identified. First case, you would have certainly not succeeded many of you would have succeeded.

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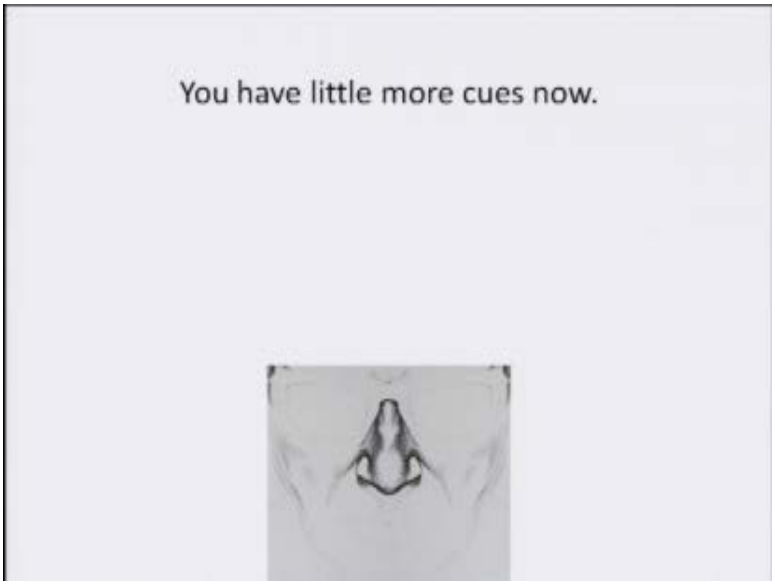

Just after the second slide okay, when these know little more cues were given.

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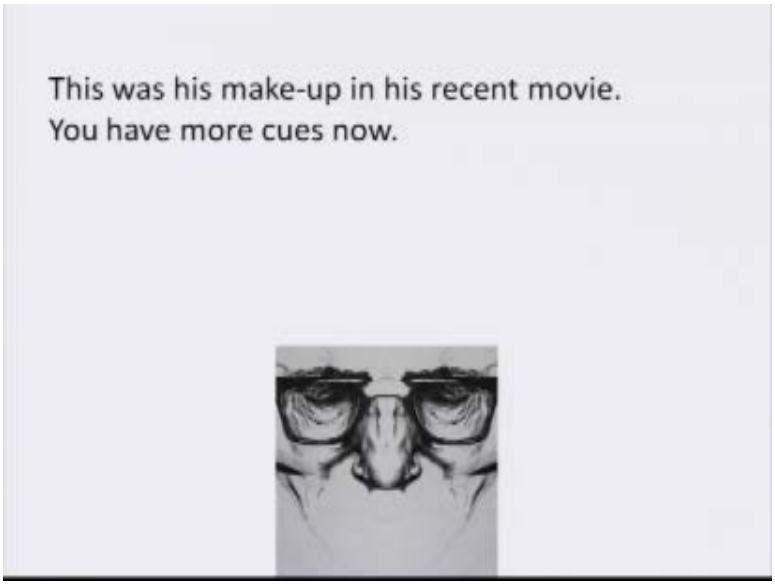

Some of you would have by this time, many of you would have probably identified.

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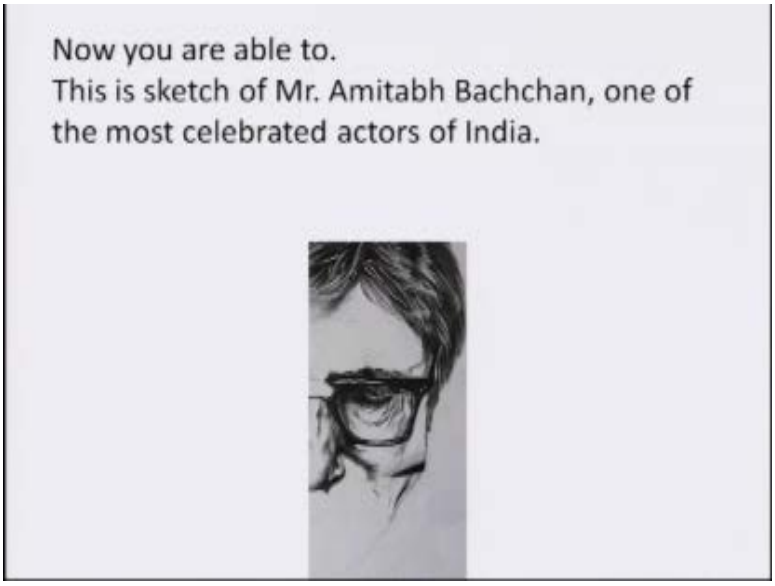
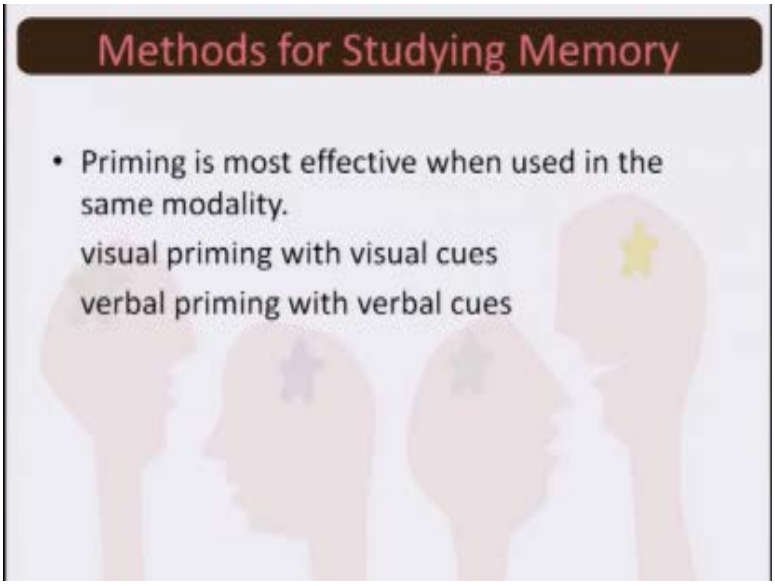


And after this much approximately all of you would have identified who this person is okay, this is called the priming technique. Now priming is considered to be most effective, when it is used.

(Refer Slide Time: 25:31)



In the same modality, so if you are using visual priming, then it is good to use visual cues and if you are using verbal priming, then it is good to use verbal cues okay. In that case priming will be very, very effective because you are using same modality.

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