Advanced Cognitive Processes
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Lecture – 32
Cognition and Emotion – II

Hello and welcome to the course introduction to advanced cognitive processes I am Ark Verma from IIT Kanpur and we are in the 7 th week of the course. We started this week talking about the interaction between cognition and emotion, we are trying to link the effects of emotional states mood states on attention and memory and we have been talking about those things. We will continue our discussion about the same kind of interaction today as well. So, one of the important kinds of memories that people harbour or people come across are refer to as the Flashbulb memory.

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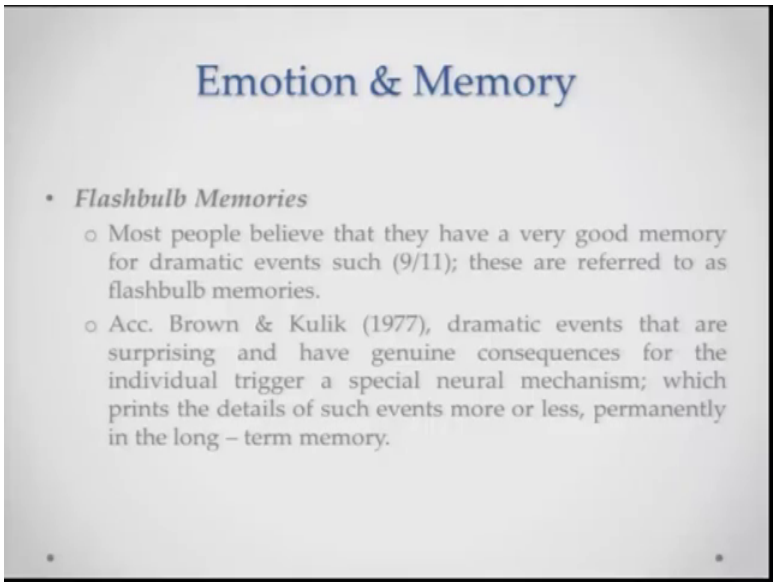

Flashbulb memories are memories for events that are you know highly dramatic or highly positively you know life changing events. So, most people you know we will tell you that they have a very good memory for the time of their lives when they were going through dramatic events say for example, dramatic events in the world at large say for example, 9 11 for the United States or 26 11 for India or say for example, you know winning of the in 2011 world cup I mean both kinds of positive or negative dramatic

events and people would remember things like you know the assassination of Rajiv Gandhi for that matter or so many different things.

So, a lot of people will tell you like you know I remember these, I remember information around these events rather vividly and they show you a high degree of confidence in these kind of things. So, this is these kind of the memories for these kind of events this kind of dramatic events both positive and negative is a referred to as flashbulb memories you know these events are also I have talked about this in a memory chapter in the other course a lot. So, I will this kind of you know revise that a little bit for people.

So, you know these kind of events that happen at the time of your life when significant changes are coming things like you know where the point when you got your first job, the point when you got married, what were your mental condition at that point denying what was happening around you. So, the idea is in individual lives as well or in broadly as I was mentioning 9 11, 26 11 you know assassination of Rajiv Gandhi if and those kind of things people tend to have better memory for these events.

So, Brown and Kulik they basically in 1997 they proposed that dramatic events that are surprising have genuine consequences and they these genuine consequences have in individual trigger they basically trigger a special kind of a neural mechanism and this neutral mechanism what it does is it prints the details of such events in a more or less permanent sort of a manner in your head. So, the idea is they are saying Brown and Kulik are saying that these events because they are so high in significance they are kind of automatically affecting the way you are going to encode this information and this encoding is basically going to stay there for almost your entire life, but this proposal has been cross viewed and cross examined.

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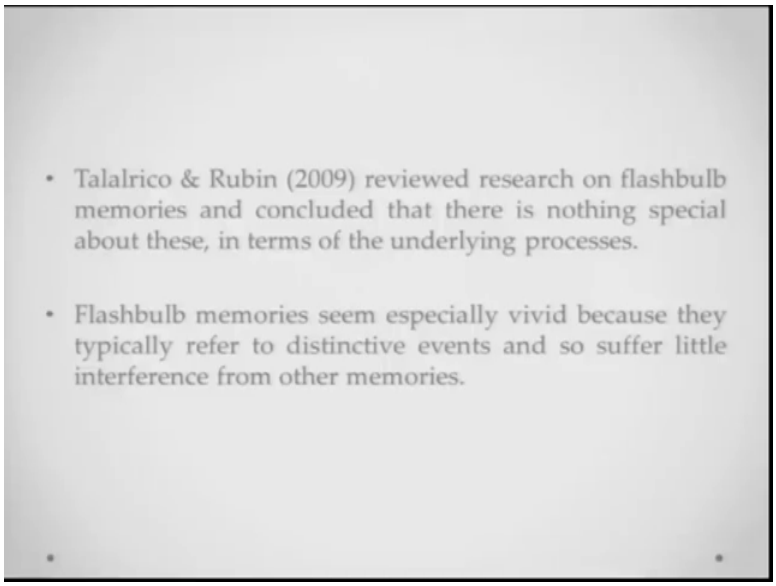

So, Talalrico and Rubin in 2009 rather recently and they reviewed a lot of research on flashbulb memories and they concluded that nothing very special about the flashbulb memories in particular in terms of the underlying processing that is going on in the brain. So, maybe this individual trigger that you know the Brown and Kulik are talking about is not really happening there in terms at least in terms of neural processes.

Flashbulb memory is seem especially vivid because they typically refer to these distinctive events and sometimes suffer. So, little interference from other memories because these are standout events you know they are not things that you can easily mix up with other kinds of memories, also one of the things and I have talked about this earlier as well also one of the things about flashbulb memories is that you kind of keep hearing and rehearing them again and again.

Suppose for example, you know significant event happens today and next day it is in the news the other day, it is in you know some parallel debates somebody is discussing about that you go to your school or college, workplace, your colleagues and friends are talking about it you come back you kind of telling your family about it a little bit. So, the idea is these kind of things also this, this revision is rehearsal that multiple repetitive rehearsal that is going on might also be affecting how you are kind of encoding these things.

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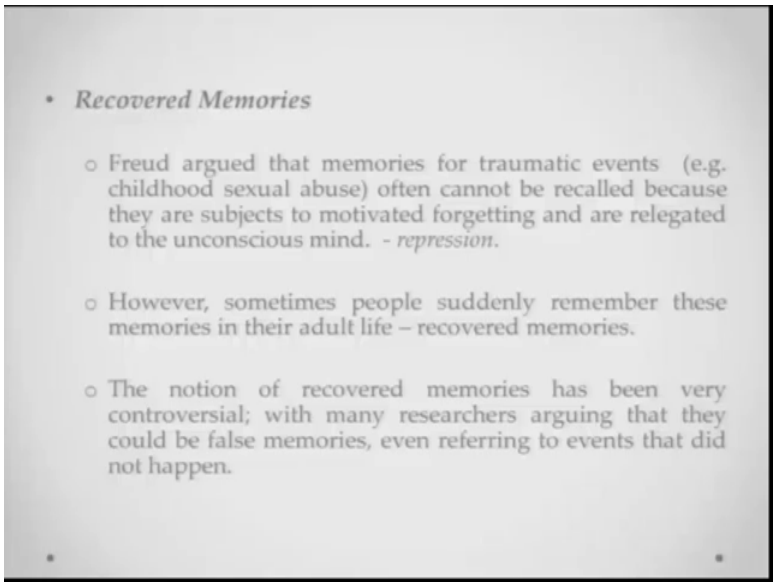

So, flashbulb memories in that sense are important and they are certainly special memories that people keep on and the people show a better recall at least for a long time. Now, let me talked about a different kind of memories recovered memories if you have read any of the literature you know from Sigmund Freud or if you want to really kind of get a peek into this you can go to the earlier course when I have talked about the history of psychology Sigmund Freud was one of the most influential psychologists you know and one of the things that he talked about persistently was the effects of you know major dramatic events like childhood sexual abuse you know and those kind of things and the kind of memories that are generated by that the idea is that those memories would scar in individual for life.

So, Freud had a different kind of a take with this and he suggested that these kind of memories the memories for dramatic events often you know cannot be consciously recalled in your adult life because these have been repressed suppressed and in some sense your it ego and you know in some sense your thing is you know is trying to protect you against these things.

So, the idea is that these memories for dramatic events to a subjected to what is referred to as motivated forgetting and they are relegated to the unconscious mind, you remember Freud talks about that there is you know the conscious mind, subconscious mind and

unconscious mind. So, they are saying unconscious mind is the depths of your head and that is where these unpleasant information have been locked down and sent off.

But it has been intermittently reported that you know sometimes in their adult lives people suddenly remember these memories, suddenly they recover these kind of memories the repression is kind of loosened and something triggers the recall of such memories you know. So, these memories which were repressed earlier and they (Refer Time: 06:36) is suddenly come back are what is referred to as the recovered memories.

So, the notion of recovered memories has been rather controversial because a lot of researchers have said that this might not really be real memories after all these might be memories that basically are false memories you know and sometimes are even referring to events that actually did not happen and you kind of you know the people, who are dealing with these recovered memories are kind of at be because they did not remember anything like this happened in their own lives for a such a long time and suddenly the they are the kind of get these flashback suddenly they get this knowledge that this might also have happened.

But there is; obviously, a great doubt in detail grout great debate between whether these record memories are genuine or not. So, that there could be a way to really talk about this whole life.

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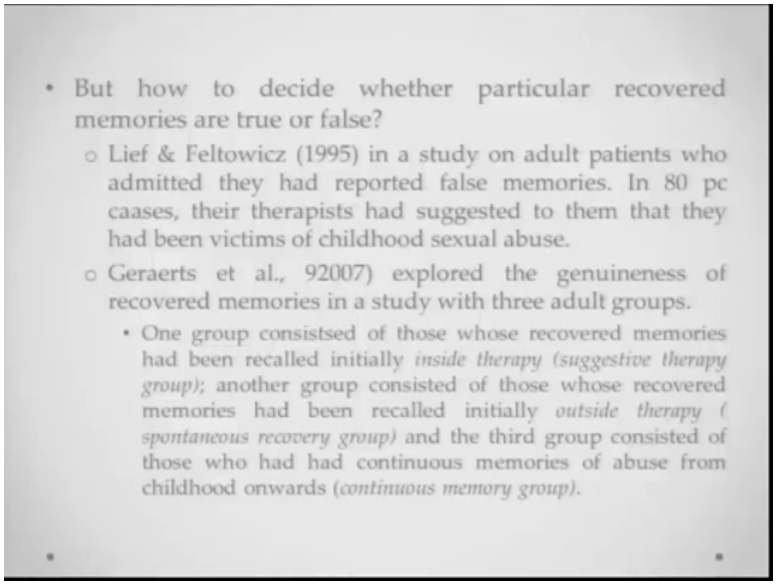

And fell to which they basically in a study on adult patients admitted when they showed that a lot of patients admitted having false memories 80 percent of their cases the therapist has suggested to them you know suggested to them that they had been victims of childhood sexual abuse etcetera and what these people probably did is consciously or subconsciously reconstructed events where something might like that might have happened even though in reality some nothing of that sort might have happened.

So, again you know these kind of therapeutic things might kind have a different kind of consequences as well. Now Geraerts and colleagues in 2007 they wanted to check the genuineness of these you know recovered memories and so they had 3 groups of patients they had patients who had reported recovered memories while they were in therapy while they were in contact with the psychologists and we were having these therapeutic sessions.

And they had another group who said that they had recovered these memories outside therapy they were not taking any therapy it was not suggested by anybody, but they suddenly themselves started recalling these kind of things and then there was a third group a continuous you know memory group which basically had all of these memories throughout their life. So, they had not never really forgotten that anyways.

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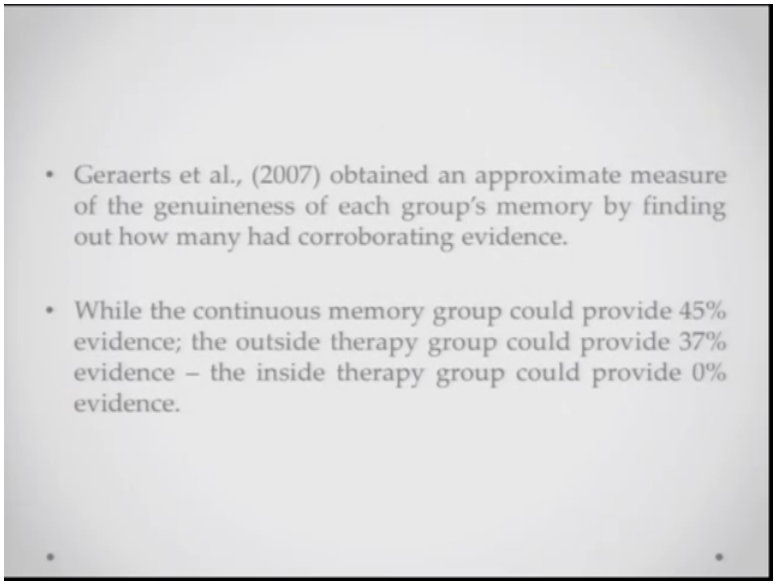

So, the 3 groups over there and Geraerts basically a Geraerts and colleagues they basically you know wanted to get and approximate measure of the genuineness of

whatever memories these people have been reporting and they basically asked them to provide corroborating evidence. So, this is what happened in your life can you give us some supporting evidence by you know way of dates names people you know who kind of confirm your account those kind of things. So, they asked these people to come up with corroborating evidence about these particular memories.

Now a very interesting thing happens so while the continuous memory group; obviously, because, they have not even forgotten these things could provide most 45 percent of the evidence, the outside therapy group would also give kind of comparable evidence around 37 - 38 percent, but most interestingly the group that had reported recovering these memories inside therapy could not come up with a single evidence shade.

So, the idea is probably what is happening with these people is that when they are in therapy, they are in a highly suggestible state and this person in a position of power here the psychologist is suggesting that if you know that I think your problems are because you were you know sexually abused in your childhood or somebody has mistreated you and those kind of things and a lot of times what happens is these suggestions lead to formation of memories you know the human mind is a rather constructive.

We have talked about constructive effects of memory at length in one of the courses of you want to really refer back go back to the last course and kind of go through the memory lectures I have talked about these things, but the idea is what is happening with these reconstruct recovered memories is probably the people are reporting you know are just kind of constructing them because of high suggestibility.

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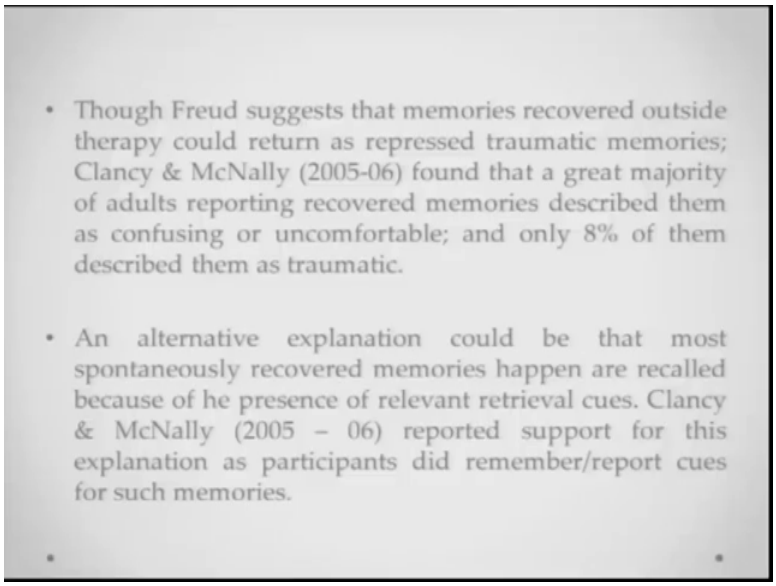

Now even though Freud basically suggested that memories recovered outside therapy could return as repressed memories because they are dramatic memories Clancy and McNally in 2005 and 6 they found that a great majority of adults who reported recovered memories described them as confusing or uncomfortable, but none of them all or only a very few 8 percent of them described them as being dramatic. So, I mean again that that came also does not really hold a lot of water.

Now, in alternative explanation could be that most spontaneously recovered memories happen because they are they might have been recalled because of some environmental cues something visiting the same place where something might have happened or meeting the same person after 10 20 30 years those kind of cues might be used to bring back these kind of memories so, that is a very important aspect.

Clancy and McNally basically you reported support for this kind of explanation and the kind of reported that yes participants did to report that these memories were recovered because they were doing something or they were engaging with information that could have acted as cue. So, that is a little bit about the recovered memories. Now, let us move on to a different topic let us move on to a memories and the emotions and what the brain has to do with it.

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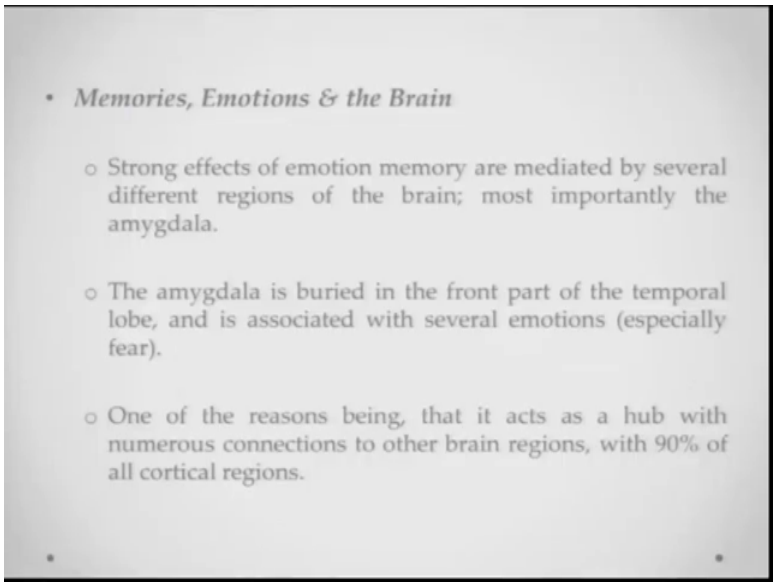

So, a strong effects of emotion on memory have been mediated I mean they are certainly mediated by several of the regions of the brain that deal with you know emotional appraisal expression and comprehension, but most important organ and the most important area of the brain in perceiving emotions is the amygdale..

Now the amygdala basically is buried in the front part of the temporal lobe and is associated with several emotions processing. So, what is happen is, one of the reasons being that it acts as a hub. So, one of the reasons why amygdala might be so, important in perception and computation of emotions is that amygdala acts as a hub for numerous connections to different kinds of brain regions and it has connections to up to 90 percent of the entire cortex.

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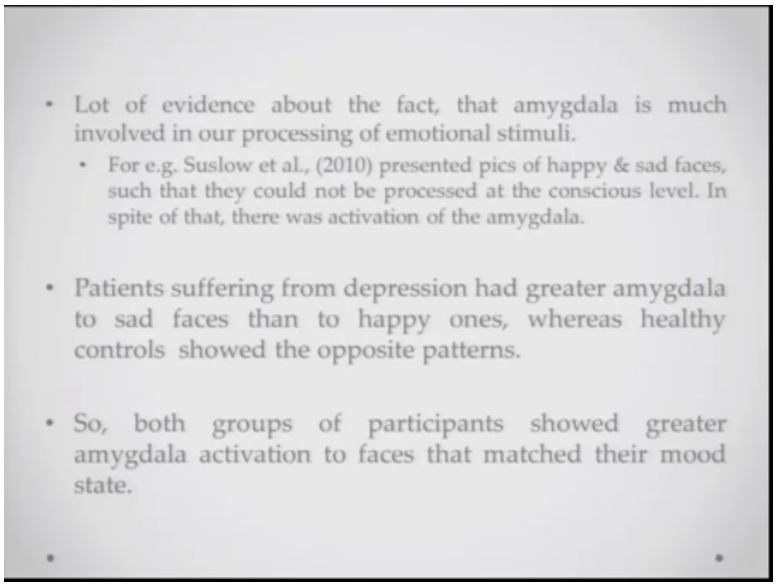

Now there is already lot of evidence about the fact that amygdala is you know much involved in our processing of emotional stimuli for example, slow and colleagues in 2 thousand 10 they presented pictures of happy and sad faces to participants in such a way that they could not have been consciously seen they would presented for a very short duration, in spite of not being consciously accessible these pictures of sad and happy expressions did activate the amygdala and activations of amygdala were recorded so, that is one part.

Patient suffering from depression were found to have greater amygdala activity 2 sad faces than 2 happy ones whereas, healthy control showed more amygdala activity to happy face then sad one. So, you know the kind of emotion that is processing or that is relevant to you that you are kind of paying more attention to is showing greater amygdala activity. So, both of the groups of the participants are showing greater amygdala activations to you know faces or expressions that are matching their current mood state. Again kind of confirms the MSBM and MCM kind of things we are talking about.

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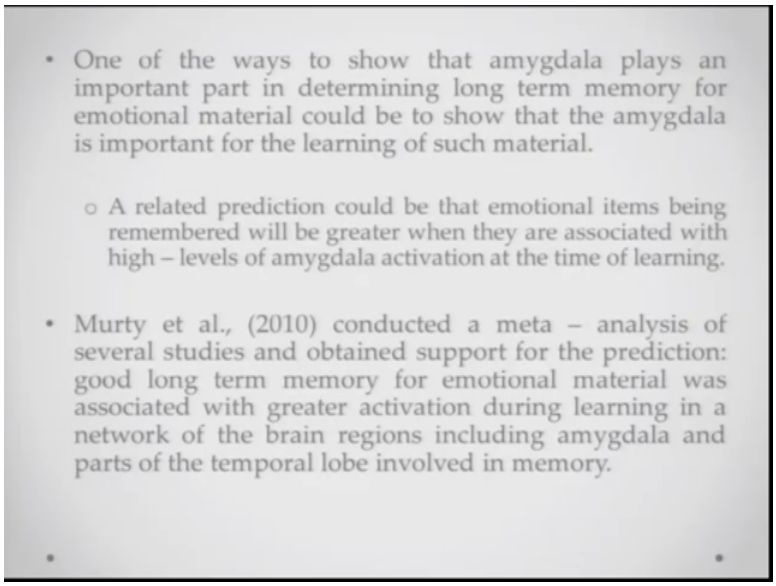

Now, one of the ways to show that amygdala plays a very important part in determining long term memory for emotional material could be to show that the amygdala is important for learning of such materials. So, if you can show that you know during the learning of such kind of a material amygdala activation is there, during the encoding such material amygdala activation is there, then whether recall is happening and again you find similar amygdala activation when you can kind of link these 2 things very cleanly..

So, a relative prediction could be that you know emotional items being remembered will be greater you know will be greater when they are associated with high levels of amygdala activity at the time of learning. This is precisely what happens in Murty and colleagues 2010 study, they conducted a meta analysis that they are not really conducting experiment study they kind of collected conducted a meta analysis of several studies and they did obtain support for the prediction, good long term memory for emotional material was associated with higher activation at the time of learning, in the network of brain regions including amygdala and other parts of the temporal lobe that are involved with memory.

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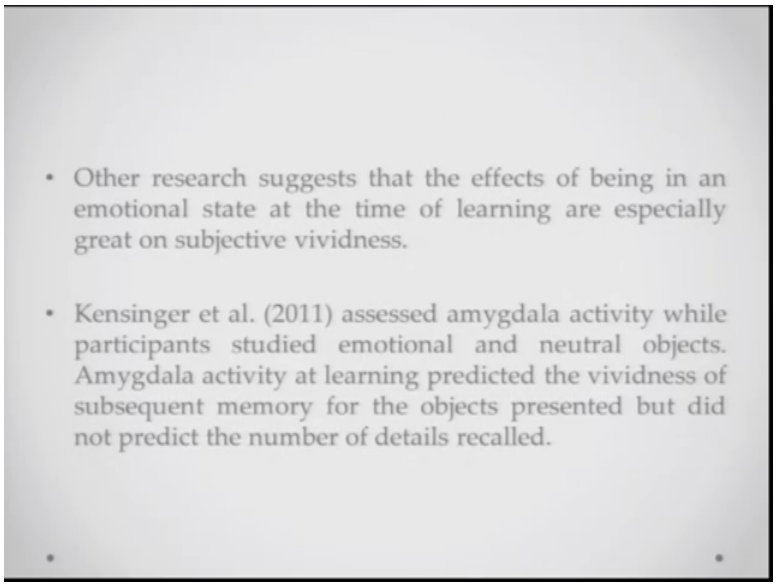

Other kind of research has suggested that the effects of being in an emotional state at the time of learning are specially great on subjective vividness you know the amount of detail that you will recall if you are in a particular kind of emotional state might be very interesting might be too much.

So, Kensinger and colleagues in 2011 they assessed amygdala activities while participants studied emotional and neutral objects you know things that have some emotional value and then again neutral objects. Amygdala activity at learning predicted the vividness of recall you know the kind of details they would be able to come up with for these kind of objects, but did not really predict the number of details, but the vividness how clearly how confidently you are you are remembering about these things.

I would talk about interesting disease the Urbach – Wiethe Disease.

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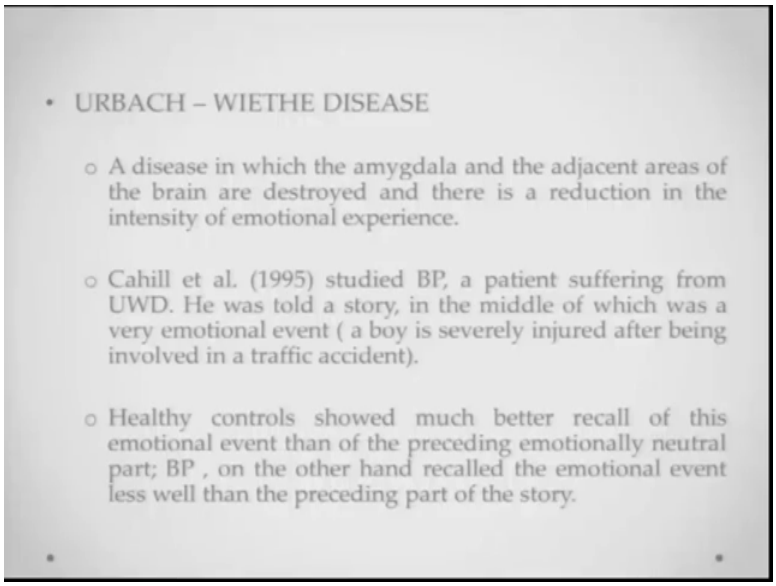

The Urbach Wiethe disease is basically one in which the amygdala and the adjacent areas of the brain are destroyed and then there is a reduction in the intensity of emotional experience so, people whose amygdala is damaged people whose amygdala in entire adjacent regions are damaged.

So, Chaill and colleagues in 1995 they studied BP, BP was suffering from UWD and he was basically in an experimental setting told the story in the middle of fish. There is a very emotionally charged event that occurs there is a boy who kind of suffers a major accident and loses his leg, healthy control showed much better recall of this emotionally charged event because; obviously, emotions enhance memory, but BP this patient of UWD on the other hand recalled the emotional event less well than the neutral parts or the preceding parts of the story.

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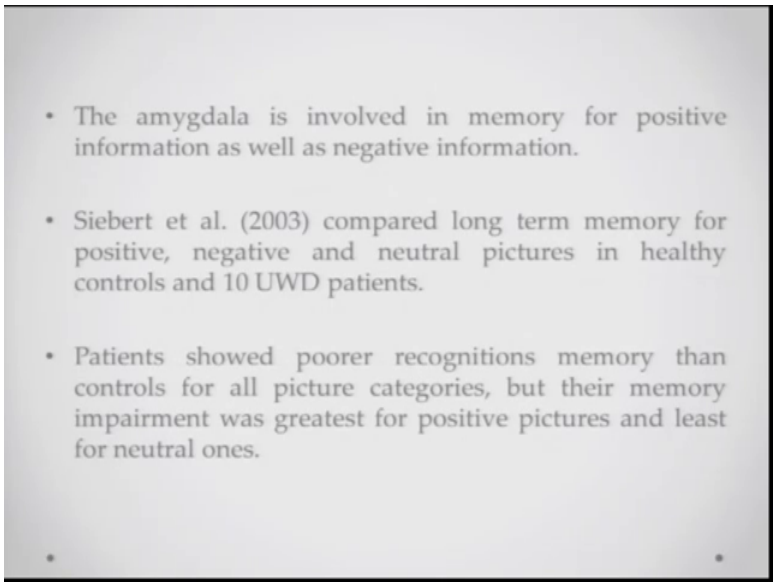

So, that kind of tells you that how important amygdala is in processing of emotional information amygdala is also involved in memory for positive information as well as negative information.

Siebert and colleagues in 2013 they compared the long term memory for positive negative and neutral pictures in healthy controls and 10 UWD patients, what they found was that poor recognition was showed for memory for all picture categories, but their memory impairment was greater for positive pictures and least for neutral ones. So, in the patience of UWD they are able to they are much less able to appreciate positive emotions and you know or emotional material in general.

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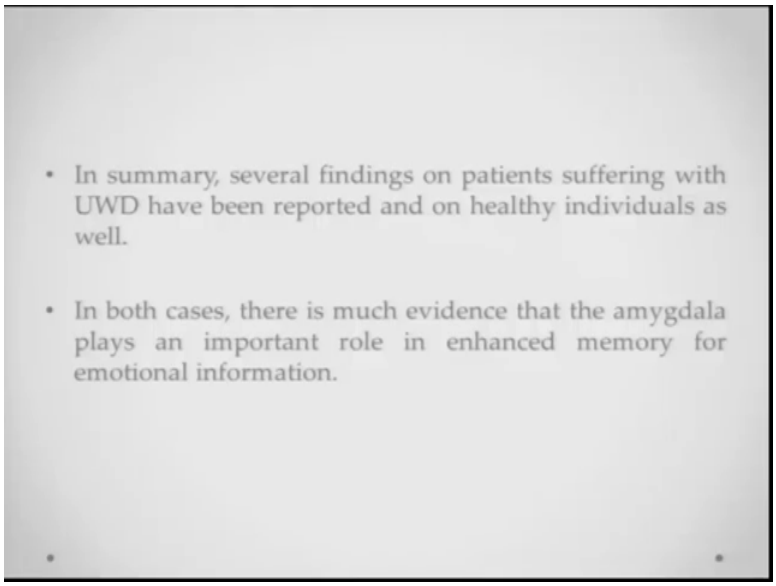

So, in summary if I just try to sum it up several findings on patients suffering from UWD have been reported and they have been compared and contrasted with healthy individuals emotional tasks memory tasks and those kind of things in both cases there is solid evidence that the amygdala does play a very important role in enhanced memory for emotional information. That is all from my side in this lecture we will continue talking about cognition and emotion in the next lecture.