Introduction to Cognitive Psychology
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Lecture - 12
Memory: Yes, I Remember or Wait I know

Welcome back to this section on Short Term Memory. And we basically stopped at the point of what short term memory is in the last section. We discussed the whole idea of what short term memory is. So, in this session will look into a storminess into a new conceptualization of short term memory which is called the Working Memory. So, the let us first look at why this concept of working memory was produced or it was presented at all.

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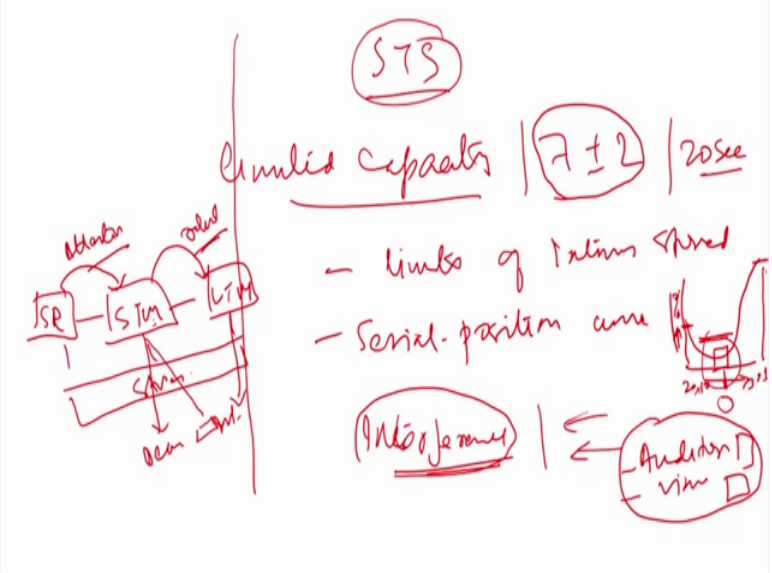

The reason why working memory was presented was the fact that the short term store as we discussed in the last class it was basically problematic, problematic in many reasons. Now the short term store the idea of the short-term memory which is a limited capacity stored with 7 plus or minus 2 items, as the maximum entitlement of item which is based here and also for a time duration of 20 second this proposed a number of problems. What was it the first problem that it posed? Is that this store limits the number of information that I can store here.

So, there were limits on to the number of items stored here. Also, in a standard serial position curve people should not be able to retrieve items in the middle of the list. So, this is how does serial position curve look like. So, this is where the recency effect happen this is by the primacy happens and the items in the middle of the list should not show any kind of better recall. So, this on the this axis we have the percentage of recall on this axis this is the serial position of items.

So, these are items which are the beginning of the list. So, item number 1 2 3 all here item if it if it is a 20-item list item number 20 18 and 19 fall here. And so, item number 11 12 are what are present here. So, it was found out that these items when they were familiar to people the items when these items when which were familiar to people or people knew it somehow, they.

So, basically then items which are familiar to people they should pose a problem to people in terms of remembrance, but what was happening is that the item which has which are familiar to people they were showing better remembrance also, in terms of interference that we discussed, this interference that we are talking about items or different codes or different types of items.

For example, auditory item and auditory cue auditory test item and a visual test item when they were presented to people in s STM where people were asked to remember these 2 items in STM people were not showing any kind of interference. And so, the fact of the matter was this STM or the short-term memory or the short-term store that we are talking about was a little more than the way it was perceived into that Atkinson and Shiffrin model. Now, since we have not discussed that Atkinson and Shiffrin model very quickly look into it Atkinson and Shiffrin's model is very similar to the model which is called the modal memory model.

So, what Atkinson and Shiffrin's says is that memory is a 3-part system which starts with something called the sensory register as something called the short-term memory and then is followed by something called the long-term memory. So, these are what attentional Shiffrin calls as the stores the different stores and that is why he says sensory store the short-term store and long-term store with these additionally Atkinson and Shiffrin's. Also, define certain control on active processes which move information either from one store to another or move information out of these stores.

And so, what Atkinson and Shiffrin model discuss is is there is something called attention here which makes information move from the short-term register or the short-term store to the STM. So, short term memory and from the short-term memory information is moved to the long-term memory depends on a process which is called rehearsal. So, this is how the items move from one store to another also decay and interference are 2 phenomena. So, which items move out of these 2 stores? So, decay interference happens in terms of long term memory as well as short term memory as this is what a brief overview of Atkinson and Shiffrin model is.

We will discuss this model in the long-term memory. So, basically 2 positions we look at interference and in terms of items in the middle of the list or those item which people are familiar with they showed higher amount of retrieval or certain type of rules or certain type of remembrance which required the activity of the LTM those somehow went ahead and help people in terms of the memory.

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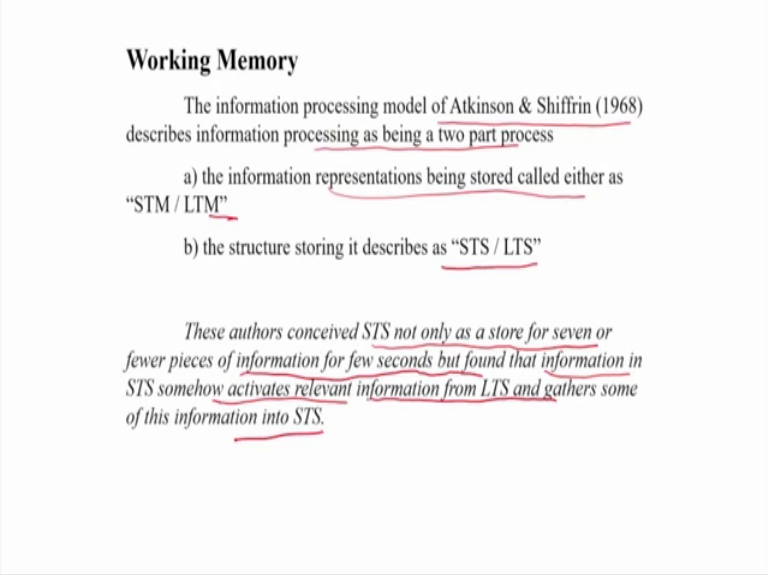

So, with this conceptualization, another kind of store was perceived or another kind of store was thought of and that was called the working memory store. So, the information processing of Atkinson and Shiffrin 68 describe information processing as a 2 part process the information representations being stored either as a STM or LTM and the structure defining an STM and LTM store. And also, the processes which is knowing these authors they conceived a STM not as a store for 7 or fewer piece of information for

few seconds, but found that the information in STS. Somehow activates relevant information from LTS and gathers some of this information into STS.

So, this is what the conceptualization of the STS or the short-term store or the Atkinson and Shiffrin's model was, but then I describe to the problem these 2 problem lead to the emergence of a new store a new kind of a memory system which was developed by Baddeley and Hitch.

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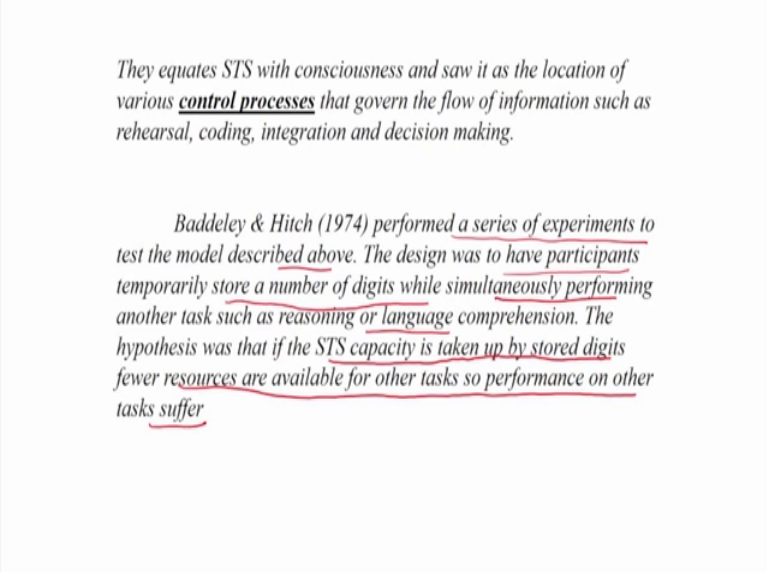

Now, Baddeley and Hitch in 1974 they performed a series of experiments to test the model which was described above which was Atkinson and Shiffrin model of how the STM works? And what is the way in which STM owes information from itself onto the long-term memory or how it receives information from the short-term store now the design was to have participants temporarily store a number of digits.

While simultaneously performing another task, which is a reasoning or language task. So, 2 types of tasks were given to people and errors the STM. So, has 7 plus or minus 2 item it was believed that if number of items are increased on to the short term store some kind of interference or some kind of forgetting would happen or the task would have a lower performance poor performance. Now, the hypothesis was that STM capacity is taken up by stored digits fewer resources are available for another task. And so, performance of the task would suffer as I just described to you what happens is, if 2 kind of tasks are given and one task is being stored on to the STS or the short term store, then

what would happen is, that the next task which is given to you if it is a multidimensional task paradine and if a second task is given to you the second task will not be processed or if it you process the performance will be ready bad on to it and.

So, this is the conceptualization which Baddeley and Hitch came up with a new dimension or a new kind of memory system which was called the working memory system now what was this task all about.

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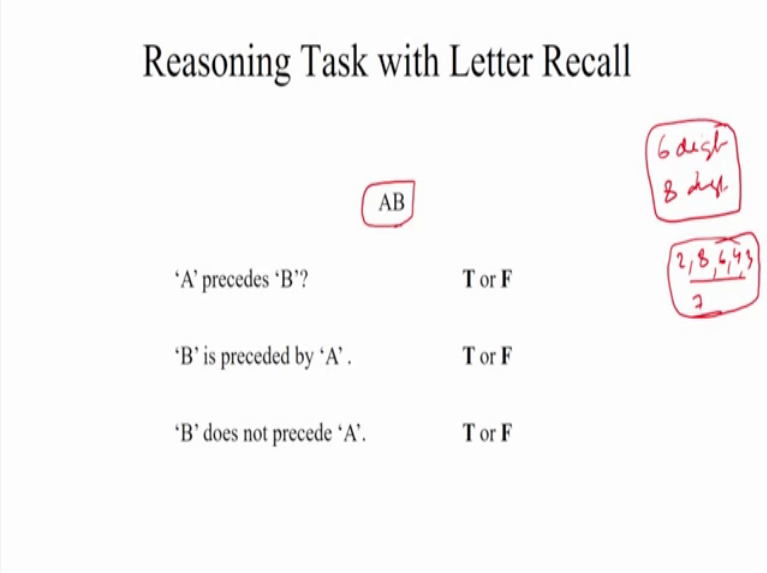

So, let us quickly look at the task that Baddeley and Hitch came up with the idea where Baddeley and Hitch came up with. And so, what Baddeley and Hitchs task was all the reasoning task with a recall letter recall. So, what this task generally had is people had first of all they had to keep some letters stored and number of digits. So, a 6 digit or a 8-digit frame was what was what people had to store on to their memory. So, they had to remember these 6 digits.

So, let us say the digits are 8 2 8 6 4 3 7 this kind of a set up was given and they were people were asked to commit to memory this particular kind of a system which was there. And the later on they were given another kind of a logical decision-making task. So, for example, here AB the letters AB are presented to people now what they were required to do while holding on to this 6 or 8 digit in memory is basically tell as quickly as possible verify the statements whether A precedes B people had to say true or false or whether B is preceded by A.

So, this kind of a thing was given to people and they had to keep this 8 or 6 digits on to the memory. And later on, verify this statements this AB is given to people and then shown to people and then they have to verify this A precedes B or B is preceded by A. What is the result of an experiment like this?

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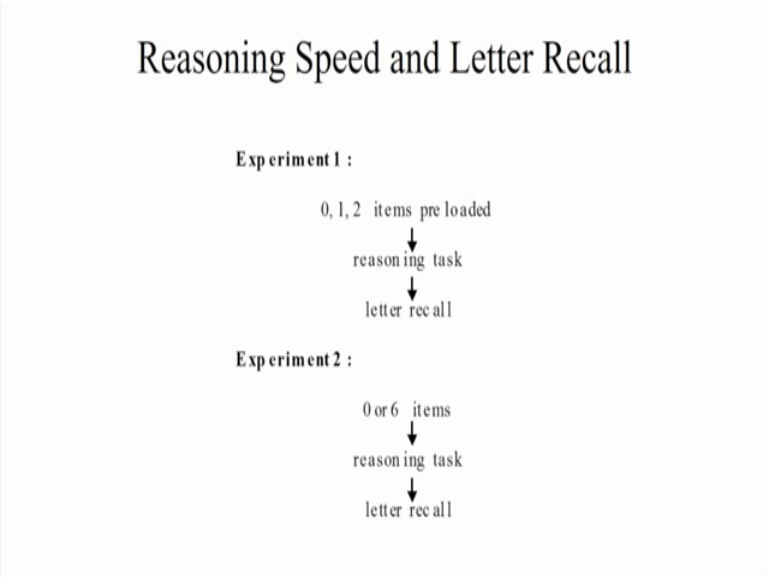

Now, generally statement like B does not precede by A this kind of a statements true or false statements was given to people. Now, the interesting thing that happened here the results to the experiments says that.

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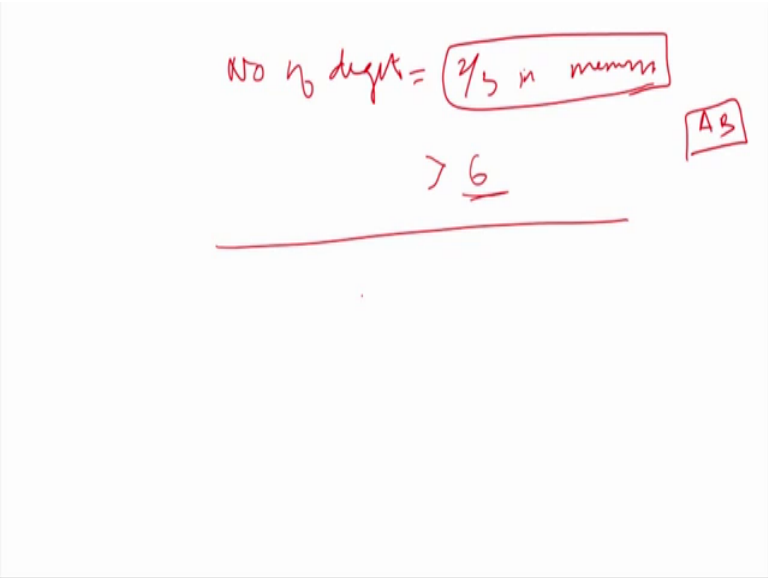

If the number of digits which were 2 to 3 if this is the number of digits which you held in memory, then the performance of people on the letter verification task on the AB verification task it was similar to what was there if no digit was given to them. So, 2 kinds of people were there or 2 groups of people were there a control group had no digit to keep in mind or keep in the memory. And then do this very sentence verification task or letter verification task and in the next case people had 2 or 3 digits in their memory. And were needed to do this kind of a verification task where as it was solved out that if the number of digits that has to be kept in the memory was more than 6 then the performance went down there was poor performance.

So, if sentences also some of the interesting thing was found out that if the sentence was negative if a negative sentence was used for this kind of a thing. So, b does not precede by a look at this, this is a negative sentence. So, if a negative sentence or a passive sentence like this was used. Now in this case, is also the verification task was lower or the verification task was somehow less, but then a poor performance happen. So, basically then what happened is 1 2 3 items are preloaded the reasoning task was done and a letter recalled task was done, but in experiment 2. What happened is 0 to 6 items were given to people a reasoning task were done and a letter recall task was done.

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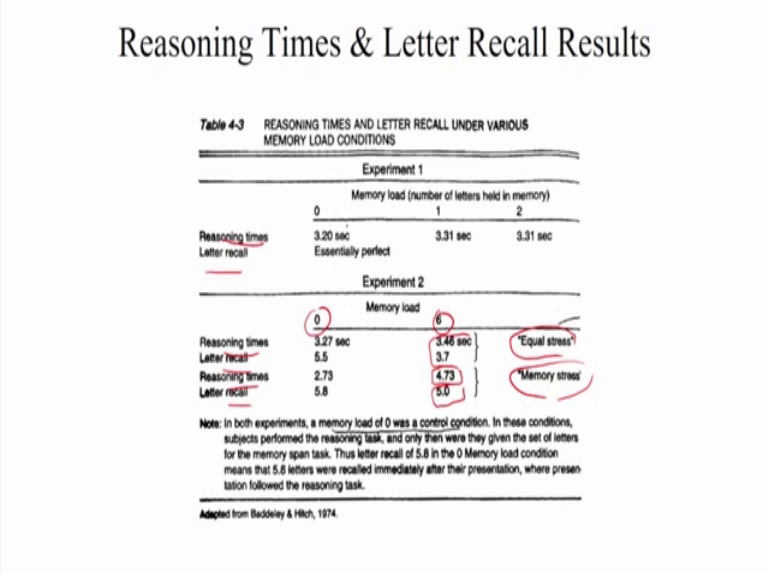

So, this is the result of the experiment what really happened. So, Baddeley and Hitch they found out that 2 codes which are different one is the logical code the other is the

digit code if 2 codes are different then with lesser number of items digits to be stored the performance was not and becoming poor or not (Refer Slide Time: 12:35) anywhere what does this suggests it suggests that the way STM is conceived in the short term store, that if the number of digits are more there will be poorer performances that is not was happening which basically means that the short-term store as conceived by Atkinson and Shiffrin.

That it is a store which have which holds on to similar kinds of 7 acoustic code in acoustic code form, similar kind of 7 plus or minus 2 item was not true. So, Baddeley and Hitch; Hitch in 1974 or Baddeley alone in 1991 they found out that they were no common system for cognitive processes there was no common short-term store which was prevalent or which was available for all kind of cognitive processes used in this. Also, the fact memory load does not disrupt the performances. So, if lower memory load are given if two task are there and if a if 1 task requires some kind of a memory load or a given little memory load, then the performance on the second task was not hindered in anyway.

And so, this is the result that we looking at, so reasoning times in terms of reasoning time letter recall reasoning time the letter recall in terms of the load was 0 and 6 and you can see what happens? Is if the load was more the reasoning time and letter recall was higher then in terms of. So, it is equal stress in this case it is memory stress. So, this is the kind of thing that happen.

So, if the number of load was one 0 1 and 2 and what do you see? That reasoning time was very less. It is nearly 3.31 second. In which people were able to perform the reasoning task, but as it increased the number of the time in these 2 almost 5 second for reasoning. If which demonstrates 2 things that parallel task processing can happen in the STM store as it was conceived by what Atkinson and Shiffrin said also the fact that STM store was not the way that it was conceived and in Atkinson and Shiffrin's. So, STM was now limited capacity store the way it was looked at into Atkinson and Shiffrin's was no more limited capacity store. It was it had more capacities it had capacities which is beyond which was a sufficiently numerous and.

Then there are certain control processes which go ahead a moving also the fact that the way this STM is conceived on to that.

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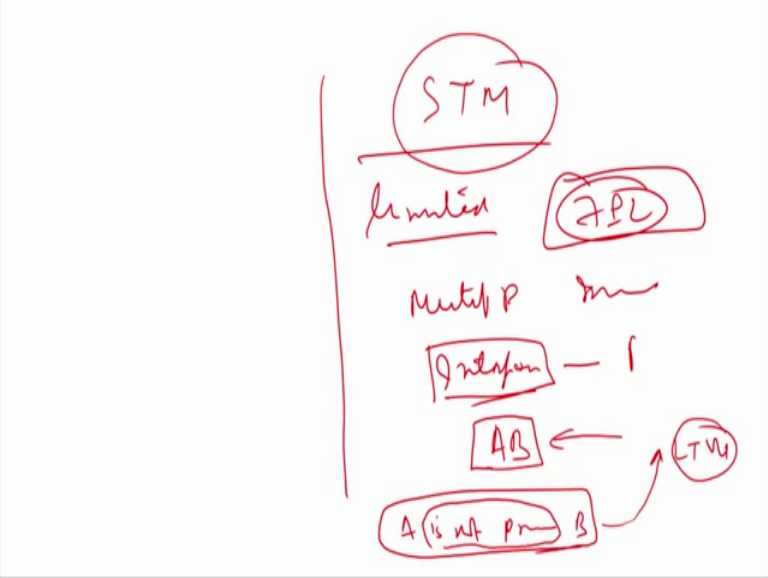

It is a limited capacity is no more true that the capacity is more than 7 plus or minus 2. The way that is looked into also if multiple tasks are given people are able to complete this task and interference. That we talked about that is not the reason or could be although it is a reason, but then if 2 different types of items are taken then both are can be processed which gave the idea also one more thing to be looked at here is that both the task require different kind of jobs. The A n the AB verification task require people to borrow from long term memory the rule for verification. Example, let us say this is a and B and if there is a sentence the sentence say that a precedes by B. Now, this is the sentence or the sentence say that B is preceded by A or thinks that B is not A is not preceded by B.

So, if A is not preceded a is not preceded by B if this is what you need to verify or B is not succeeded by a this is a sentences. That we have to verify first of all this is the negative sentence and then the words have a meaning and the way that the verification happens. Is that these rules are actually stored into something called the long-term memory? So, long term memory has these rules to stored up. So, what the conceptualization was that these experiments for Baddeley and Hitch they gave up 3 broad tool like 3 new important factors about STM one that STM can talk to long term memory. And can at the time of processing itself can borrow rules from long term memory. And that is how this verification really happens the conceptualization of

Atkinson and Shiffrin was that STM is a store which basically keeps items and works and links to together through a controlled process.

But on itself does nothing to the item where as Baddeley and Hitch prove for the first time that there can be this kind of a sentence verification task. Basically, here the possibility or laid the foundation the fact that more integrate or more complex verifications or more complex processes can be done on to this kind of task, which were presented to people. Also, the fact that if items different items were first of all is not that acoustic code in which most items are stored in sort term memory it is different codes which are there. And so, there are different stores within the short term memory is what the conceptualization was and for the first time it was found out that these idea of limited capacity was not choose or a short-term memory was not sort of a limited capacity store, other thing that interferences do happen, but then if items are of slightly different a nature then these interferences are not.

So, prominent if the items 2 task has little items to get looked interfered to the net differences not result also the fact that at the time of the working memory execution. At the time of when item is into STM with the control processes there are other processes were LTM rules can be borrowed and some kind of processes some kind of operations can be down onto jobs put into this particular store. And so, a new conceptualization, a new idea of a store was thought of and this idea or this store was what was the working memory store.

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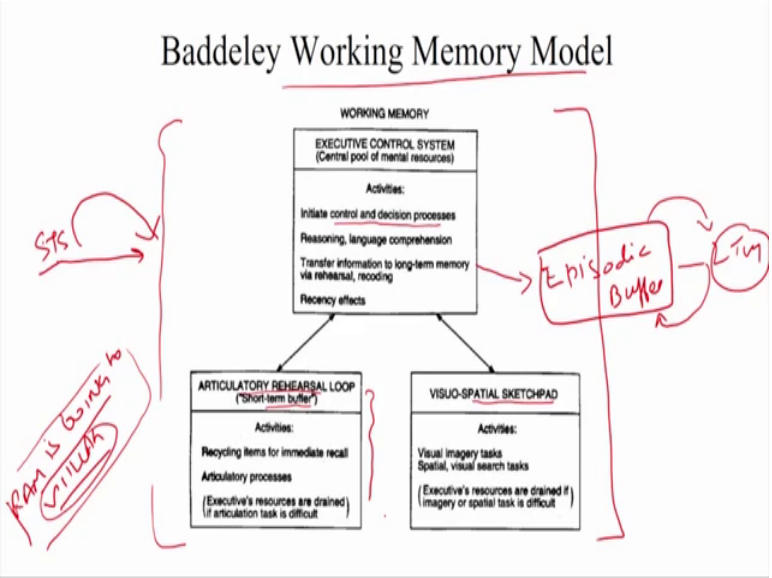

And. So, Baddeley and Hitch gave the idea of this working memory store. Now, this is a very, very interesting conceptualization because this till date this is the best conceptualization of short term memory which has been out there and the best results have been are approved all this. So, what is working memory then? Now working memory as conceptualized by Baddeley and Hitch is a 3-part system. What happens is this itself this whole part is now called as the short-term store. Although, a new additional item is included here which is called the episodic buffer which I have not demonstrated here, but then this is the third system. So, it is basically a 3-part store controlled by a central part.

So, the conceptualization or the working memory is done and they say information from the short-term store through attentional filters, attentional processes reaches something called the central executive. So, while working memory store is a 3-part system it has something called the central executive, it has something called the phonological loop, it has something called the visuo spatial sketchpad and here something called the episodic buffer, so information which comes from the short-term store. So, the attentional process in different-different modalities reach generally something called the central executive of the working memory. Now, what are the activities of this central executive? The activities are to initiate control a decision process the central executive can be thought of as a manager it does not do anything. It takes an information from the short term store

and then manages this information or basically redistribute this information on to 2 sub stores which are there and.

So, the 2 sub stores are the chronological loop or the articulatory rehearsal loop and the visuo spatial sketchpad now information which is verbal in nature which is auditory in nature or pushed on to the articulatory loop articulatory has a loop or the phonological loop. Whereas information which is both special or spatial I would say in nature or which requires visual medium which is a in terms of visual medium are pushed on to the visuo spatial sketchpad. So, what basically? If then executive control system it thus takes an information from any medium and through loaded into these 2 stores which are there let us look into one by one these stores. So, basically then executive control system or executive store is basically a related to or it is activities are initiating controlling decision processes.

So, basically it initiate control it distribute this information if information come from STS into these 2 stores also reasoning language and comprehension. So, basically if a task requires people to do reasoning or to basically go ahead and and use language. Then in those cases people if (Refer Time: 22:00) on languages the requirement of a job then in those case says what needs to be done is that, the central executive comes into focus and then it does this job. How does this does this job? Of reasoning what it tends to do is talks to the LTM through am episodic buffer. Now, as you know then in Atkinson and Shiffrin model the LTM is a store where most information is stored.

Now, in coming lecture will look into how the LTM is arranged what is the way in which LTM is arranged and what is the way in which LTM really works will look into the parts of the LTM, but then most tool facts or the things that we called memory are stored on to what is called the LTM. So, what this particular model does is that executive control whenever it needs to do a task it sense or it makes this reasoning language decisions based on tools which are borrowed from LTM. For example, let us take a very easy task the idea of being more. So, if a thing is more than something else let us say if a has more number of if there are 2 jars and this jar A has 4 items into it or 4 balls into it and jar B has 8 balls into it and the concept more. So, now the question is whether jar A or jar B is has more number of balls.

So, that is the question which needs to be verified then central (Refer Slide Time:23:31) does this verification by first taking this information the information that there is a jar, there are number of balls and pushes this information into the visual system. Then to the episodic buffer it talks on to the long-term memory and borrows the rule for what is more the definition of what do you mean by more what it does is it talks to long term memory and the long-term memory. Then reveals or relates back the idea of what is more on to the episodic buffer.

The episodic buffer, transfers this information to the central executive which then understand what is more and then does the comparison also, it transfers information to long term memory by rehearsal and recoding. So, whatever answers that you get from these kind of control processes this kind of rules which have borrowed from long term memory and the information which is inputted to both the articulatory loop and the visuo spatial sketchpad these informations when it makes any kind of meaning or if it needs to be stored (Refer Time: 24:31) process of rehearsal it is transferred to long term memory. For example, say if there is an event you see your picture from the 4th or 5th class and.

So, you see a friend of yours and now you know this friend is now married and does a job there. So, this information update which is called recoding of information. So, the friend which is there with you in the 5th class; obviously, at that point of time he has he does not has this features of getting married or having a particular kind of a job or doing particular kind of a thing or look in a different kind of a way. So, these informations are added upto this event and retransferred it back to LTM memory. So, that LTM is updated on to these information.

So, this is what also the central executive does and effects like recency primacy also which is verified by the central executive now the central executive takes in auditory information and pushes off these information into the phonological loop now the phonological loop has a idea of something called sub vocal rehearsal. So, it does auditory rehearsal as I said the conceptualization of working memories better than short term store because the short-term store only talks about auditory codes, but then working memory does not talk about auditory codes it talks about both image code which is image code.

And auditory code the phonological loop that we are talking about has auditory code as the way of remembering things. And so, information which is passed on or the STM is if

it is in the auditory nature this push from the working memory on to the phonological loop and then this item is a rehearsed back is remembered in terms of sub vocal rehearsal also. This phonological loop has 2 different systems into it one is called the phonological buffer the other is called the sub vocal rehearsal. Now, the phonological buffer keeps information ready for being excess.

Let us say I tell you the word ram is going to the village ram is going to the village, this sentence in an auditory code reaches were here it is passed on from the STM on to the working memory the executive central executive listens to this one channel information ram is going to the village and pushes it to the articulatory loop or phonological loop. In the phonological loop, the buffer then keeps breaks away this ram is going to the village into which constituent parts. For example, what is the subject what is the object and what is the connector what is the work and loop set the sub vocal rehearsal or sub vocal rehearsal is the is the processs, where this whole sentences loop because it is needed if it is not needed then it would not be loop and.

So, if it needed this kind of information is loop and the buffer is the place where the information stays for some period of time. Also, recycling of items if I immediately call is done by this phonological buffer and articulatory basically articulatory process at (Refer Time: 27:36) that if an item or if any piece of information which is approaching is not in the vocal dimension. If it is not vocal in any format then what happens is that that kind of information is then passed on to the visuo spatial sketchpad. So, in the visuo sketchpad the information is then broken down into his visual constituents.

And so, visual imaginary special image visual such task are done by this visual such task. And so, here what happens is that the visual images are stored nothing about seeing a movie. How is it that we see a movie when we go to a movie there? Is a wise and there is an act which is happening there is a sequence of acts which is happening here is the best example of understanding how does working memory happens.

So, generally the audition or the auditory channel is the single channel process. For example, when I see ram here is going to the village you have to listen to each word until unless you come to know the meaning of the word which basically means that ram is going to the village has to be completely said or completely relieved back to you. If that is not done then you will not understand the meaning of the word.

So, basically then ram is going to village if I auditory present you each word has to be presented to you. And so, each word has a meaning. So, as words appear to the central executive they shall pushed on to the phonological loop in the phonolical loop then sub vocally rehearse is one hour after another. So, ram is rehearsal starter is ram is the now rehearsed with (Refer Time: 29:25) then ram is going is rehearsed with 2 ram is going to rehearsed with village. And so, this is the kind of rehearsal and later you can take information, but. And so, this that is why auditory channels or auditory systems are basically a single channel system, but if I show you this as a display ram is going to the village. Now, in one particular brief moment you can look at the whole image and you can make meaning out of it.

So, that basically means that visual systems are more accurate now when you are going to, when you are in a movie, what happens is that the dialogues comes as a one channel system where as the images that you see the actions that you see is basically in terms of several sequences which are there. And so, there is where the best example of working memory is what the central executive does it takes in dialogues because dialogues precede.

So, these dialogues are taken in and then pushed on to the phonological loop and then it is mashed with the sequence of the action. So, there whole dialogues was taken in and is a repeated around through the buffer and the sub vocal rehearsal and then later on a meaning is interpreted of the seen based on the auditory feedback based on the dialogue and the action and they are mashed together with the central executive.

So, basically then both the information the auditory visual information in a movie a (Refer Time: 30:40) to the store the visual information goes on to sketchpad visual informations are slow it is basically stood down. And ariculatory information are speeded up and they are matched together in real time for giving the meaning of what you here and that is where a good example is. Now, third stage of this particular work in memory is called the episodic buffer and the job of this episodic buffer is basically to talk to the LTM. So, this episodic buffer basically does a feed forward and feedback connection with a LTM.

So, it takes an information to the LTM and takes that information also back from it that is what the idea of this phonological buffer is all about. So, basically then an experiment

was done to test the phonological loop the existence of the phonological loop. And so, what happened in this experiment was what is the span or what is the capacity of this phonological loop.

So, 3 sentences were given to people they were a very fast. And so, this sentences. So, 3 kind of sentences ram is going to the village seethe is doing something and ram is doing something this is 3 different sentences were given to people and people were asked to they laid back the last word. So, ram is going to the village. So, you have to read back the word you have to remember the word village back or tell me the word village back.

So, 3 sentences are given to people and they have to remember back these sentences. So, what was found out in this task it was found out that this span the phonological loop the efficiency of the phonological loop or the span of the phonological loop depends both on the comprehension and the task complexity the kind of task if the sentences are very simple. It is easier for people to remember back the words is a sentences are long and complex in nature or if people are not able to understand the sentences.

The sentence contains words which have difficult meaning in those cases the central executive additional input central executive is required then those task are not processed. And so, basically the recall or the span of this auditory loop depends on both the task complexity and the comprehension the way a thing is understood or read back also for visual information or visuo sketchpad similar experiment was done it was found out the complexity or the visual system depends describes the span.

So, if it is a simple system which is there if people have to look into then it was easier for people to relate back the information, but then if the information was complex then it was difficult for people to relate back the information.

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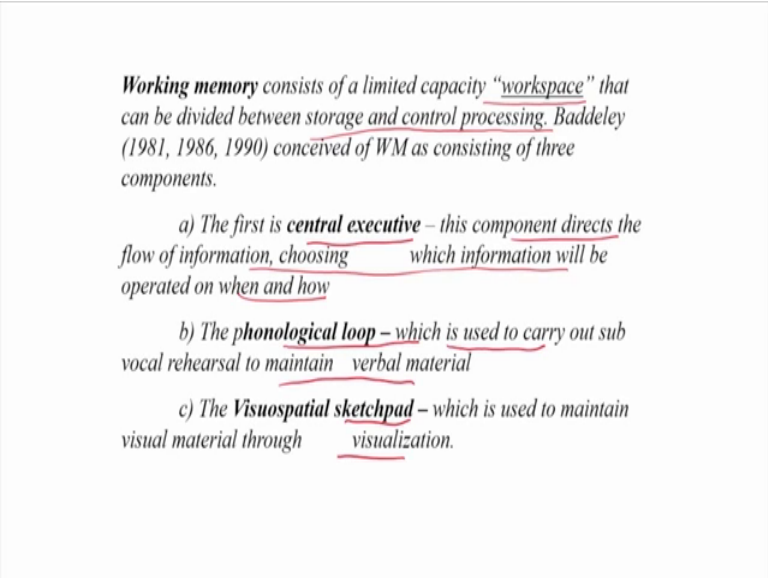

So, then what does the working memory are consist of? So, as I said it consist of a limited capacity workspace let me divided between the storage and control processing in this time. It is a central executive that we are talking about this component directs the flow of information choosing which information is to be operated on when and how as I said it is like a manager. So, takes a lot of information and then decides what information goes where then there is something called the phonological loop which is used to carry out sub vocal rehearsal and maintain verbal materials.

So, this is what we are talking about in terms of vocal and the visuo spatial sketchpad which is that part of the working memory which takes in information from the visual area.

Now, a very interesting study was done to comprehend the idea of STM.

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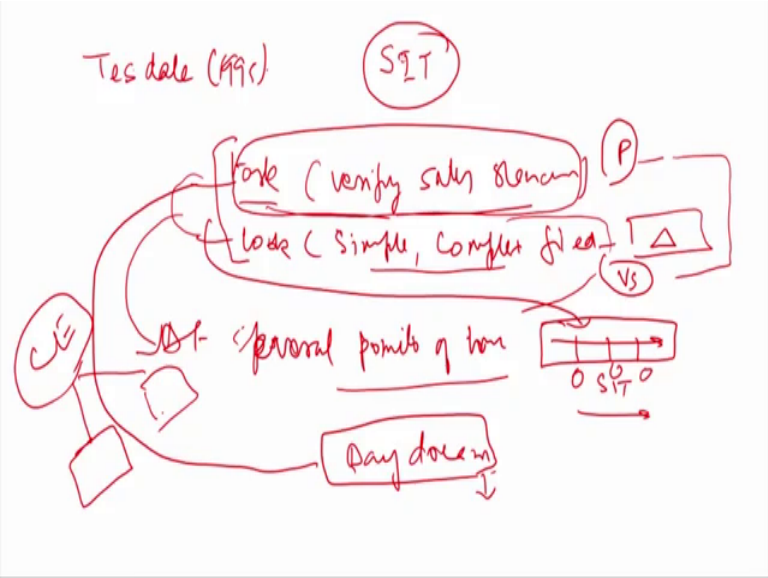

And that was with something called stimulus independent thought the s I t now the study was done by Tes dale in 1995. And so, what was the study? The study was done to find out what factors or what stores of the working memory were uses interference with stimulus independent thought. Now, what is stimulus independent thought? Let us first look into it. And so, stimulus into independent thought as it define is basically a flow of thought sorry images that the content of which is undeleted for the immediate sensory input.

So, basically it is kind of a day dream. So, basically stimulus independent thought is a thought or is is a kind of a thought process which is not related to that job at hand to the task at hand. So, the thing was task was to find out if STM disturbs by performing another task if people do another task in of short term nature if people are doing some task which is basically of some nature. Whether it is visual and phonological in nature whether stimulus independent thought are effective by 18 some way or not and that is what task was.

So, 2 type of tasks were loaded on to the central executive one task was to verify silly sentences. So, sentences like you can buy (Refer Time: 35:45) in shops or a a dog a dog was raised on a flag pole that kind of sentences were there. And so, you have to verify this sentences whether this is possible or not and another kind of task that I used was more of a looking task. So, in these some kind of a simple and complex a field was given

and within this field people had to find out no geometrical figures for example, triangles and circles. So, these kind of tasks were given as you can see this task is a phonological loop task and this as a visuo spatial sketchpad task. So, visual task and phonological task this type of a task were given to people and then people were asked to get engaged in something called stimulus independent task or basically go ahead and day dream.

So, in sessions participations. So, people then did this task and with that they also day dream. And so, what happened is that at several points of time. So, at several points of time people were basically stopped. So, this is how they are looking at this is the stimulus independent thought and they also doing some other jobs. So, these tasks are loaded here. And so, at several points of time this is the time dimension. So, they have stopped here and they asked to relate as what is going on to the through their mind.

So, they have to describe the day dream. So, the task is very simple in nature somebody is asked to day dream and with that day dreaming they are also given to more task either to verify a silly sentences which could will which had no meaning at all whether it can exist or not and then also to a do a looking task which is basically equivalent to looking at something, looking at a simple field or a complex field and find out hidden geometrical figures on to it. So, basically then in this particular the framework people were stopped at various points of time since they also day dreaming.

They asked to relate back what is it that they are dreaming what is it that they are thinking about. So, this points categorization of SIT of task it was found out that basically neither the visual task or this kind of a thing both the task together went ahead and interfered this stimulus independent task. So, if kind of extra task doing was done if people were doing some either sentence verification task which is phonological in nature or a simple looking task which is which is basically visual in nature this interfered with the stimulus independent task. It basically means that SITs are something which are not independent of these kind of a loop.

So, if a stimulus independent thought people are day dreaming and they also given another kind of which is to be done then it did interfere with the stimulus independent thought. So, it is basically then what was the result of the study that basically central executive the is the reason. Why these kinds of a disruption happen? Also, it was a origin

of this task was done in which people were able to do tasks with the stimulus independent.

So, people were asked to day dream and with this day dream they were asked to do some kind of a routine task which they always there now in those cases when people did routine tasks and they day dream then the performance on day dream the performance on relating bad day dream was not that poor. Then in cases where people were loaded up to a task or people where asked to do task which require some part of either the phonological loop or the visuo spatial sketchpad. So, basically then it is not these centers or these areas of the working memory and verification or working memory system which is responsible for disrupting the stimulus independent thought it is a central executive.

So, when it a task is been well practiced routine in nature and the central executive can divot enough attention and stimulus independent thought can process, but when a task requires a some kind of information processing, some kind of a jobs to be done or some kind of matter to be looked at some kind of verification which requires, some kind of an effort in those cases this stimulus independent thoughts got received. So, basically in this particular section what we looked into is 2 things.

So, breaking up from last session or thinking from the last session where, we look at what a short-term memory and what are the codes of short term memory, how it is stored? What is the conceptualization? What is the test for short term memory? and what is the kind of a getting happens in this particular session? We devoted ourselves on to a new conceptualization of short term memory which is the idea of working memory and we also look at how this working memory is tested. And then what is the different parts of working memory and; what is the benefit of using the working memory model over the short-term memory model.

So, one obvious benefit is that the use of working memory does not limit ourselves to limited capacities first of all then it does not basically bound us on to the concept of limited time processing. Plus, it says that, the kind of a coding that is done working memory model of short term store does not limit us to a particular kind of code which should be used for remembering. So, that is another benefit which is there plus the fact that working model or working memory model loves us to think about a conceptualization of a store in which the store can talk to LTM and can get informations.

And so, the explanation of the serial position curve that items which are familiar appeal to you more. And so, the central executive what it does is if an item appeals to you more if it relates to you in some way if the relativeness is very high it is immediately transferred on to the long-term memory or it is immediately verified, because this item is already present in the long-term memory. And so, the conceptualization or the question that came in from the results of the serial position curve that items in the middle of the list which are familiar or which are somewhere personal to people how they are remembered more that could be explained to this model of working memory. So, then working memory model is a better model of short term store or the short-term conceptualization and.

So, in this whole 3-part lecture on memory introduction to memory we saw how this memory system really works, we looked at the short-term store. The basic format of the short-term store of how, what happened, how things happen? We looked at something called the short-term store. What is the capacity of the short-term store? What it does what it does not and what kind of information is stored, and also, on to the working memory which is a better conceptualization of the short-term store. What are it is part what is the feedback it takes? In how does it connect to the long-term store? And what are the benefits of the working memory store over to the short-term store?

So, in the next coming lecture we look into something called the long-term store or the long-term memory we look into the various parts of the long-term memory. And then in upcoming lectures will also look into parts of a different conceptualizations of working memory.

Thank you.