Introduction to Cognitive Psychology
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Lecture – 19
Basics of Visual Memory

Hello friends. So, we start this new section on Visual Memory and this as to do with how picture is perceived or visual images are found. Now at the beginning of this session should tell you that visual imagery was something which was not very popularly taken in cognitive science and already psychology the reason because that visual imagery cannot be tested it is very difficult and so it is it is like what behavior is to say there is no way of testing on to it.

And so how do we understand visual imagery or let me ask you a question you all live in a house or kind of an hostel and we have been living there for a long period of time for certain periods of time. But the thing is if I ask this question all of you wherever you live you have a window and I am perfectly sure that there you have and so, if you have a window it would have a window cell also.

And so how many window cells do you have in your window and let me give me a give you a minute to think about it see you come up with an answer let us say 4, 5, 6, 7, some people will say I do not have a window cell I have a window same on to it some people have glass windows and so there is no question of cell.

Let me ask another question you all live in a house or some kind of an hostel and so there are walls, there are I am pretty sure most of you house have walls. Now what is there on the left wall from your bed and I am give you another minute to basically answer the question.

So, all of you have a wall in your bed room and so what is there on the left wall of your house of a bed room from the bed so left from the bed the wall which is there what do you have on it. And so, most people will have different kind of answers, you will have a poster on it, you would have may be some shape on to it some kind of distortions on to it or something or the other.

Now let us go back a little now when I ask you this task or when I ask you to relate this task of telling me what you have on the wall or of the question of how many window cells that you have on the window how did you come up with an answer. Now most people what they did was they went back mentally and re imagined the situation now at this point of time when you are looking at this lecture when you are hearing this lecture you are; obviously, sitting at may be at your house may be at the place where you have these walls are not or you are somewhere else.

Let us say in a garden look sitting in or standing or sitting in or looking at this lecture. So, when these questions have posted to you what you did was you mentally travelled back to that place and thought about the wall or made a structure of the wall.

So, you went back from here went back to the window went back to your first your room then looked at your room mentally in this remember all of these is happening mentally and then you turned yourself oriented yourself towards the window counted the number of cell. And then related back this to this information or you went to your room your bedroom looked at the bed then looked at identified where is the left wall. And once you have identified where the left wall is then you looked at the image which is on the left wall and indentified what is there.

And so this travelling back of you into these (Refer Time: 04:14) or in your house mentally travelling back through your house and counting these cells or telling me what is on the wall is basically what is the process of visual imagery and the process of visual memory.

So, basically visual memory is a that kind of memory which stores visual representation of things and so as we saw that in short term memory we use acoustic or representations and in long term memory we use the semantic associations the meaning related representation.

Visual representations are another representations which actually help us in remembering a lot of things now the idea of visual representations of visual imagining together of visually imagining something was something which was challenged right from the very beginning in cognitive psychology although. Alan Paivio did a lot of work in terms of visual images now stop here think about a coffee cup when you do that what really goes on in your brain.

Now scientist have look at the process of when you imagine something. So, when I am imagining when I closing my eyes and imagining a coffee cup all the same processes which happen in perception for example, taking in the stimuli through the eye, transfer of this image to the visual area from the visual area which is occipital in the occipital lobe from there into the medial temporal lobe where it will be identified where to be categorized or pattern matching will happen and from there a feedback given to the frontal area which will then make meaning from the input which is arriving from the medial temporal lobe.

So, all these process happens in perception is similar that happens in visual imagery except the one process and the process which does not happen in mentally imagery is the input of stimulus from the eye because eyes are closed. So, when you are imagining the exact same processes go on to your brain as when you are perceiving something.

And so costly in did a number of scanning experiments and number of work on to it a huge number of work on to it and basically related to these mentally imageries. Now as I said debate to start with the debate was there, but where is the visual imagery is something which should be studied or visual codes is something which should be studied or not although it is very efficient this course are very efficient and these are used in a number of situations, but should be studied or not.

And so earlier psychologists had a problem with it for one instance the behavior is certain number of problem with it the question is that visual images are personal to people right people have when I say imagine a coffee cup you are imagining an coffee cup and this imagination is very personal to you and no where I can interfere once see a coffee cup.

And so there is no way for empirically testing it there is no way to testing the fact that whether you are imagining the coffee cup or not and so I cannot beat you or I cannot go ahead and anyway verify whether you are imagining a cup or not and so you can fake and so once is does not one this process does not leads to testing once this process does not lead to empirical testing the process that the process itself should not be qualified to be called as science.

And so, initially this was not studied a lot, but with the coming up of the book called mental representation the dual process approach by Alan Paivio this idea of visual codes

or visual memory came to the forefront. So, what is visual memory exactly or what is visual imagery exactly it is the same thing as perception minus the perception input to the eye.

So, visual imagery uses the same kind of input and as w will see in this session what is visual imagery what are the basic features of it why it is used and what are the benefits of using visual imagery and. So, visual imagery as I said is another kind of mental representation.

For example, there are 4 or 5 kind of mental representations that are there mental representations are basically demonstration or mental representations are a copy of the physical representation, the physical word as it is copied into the psychological l m into the mind l m is mental representations and so two code that we have looked before is the semantic code, the semantic representation and the acoustic representation. And with that we have the propositional representations and we also have the visual representations.

So, we look into the propositional representations in the visual representations although the propositional representation something which we looked at before in terms of adhesions theory in the semantic memory where he talked about propositional thought and how propositional representations are represented into semantic memory.

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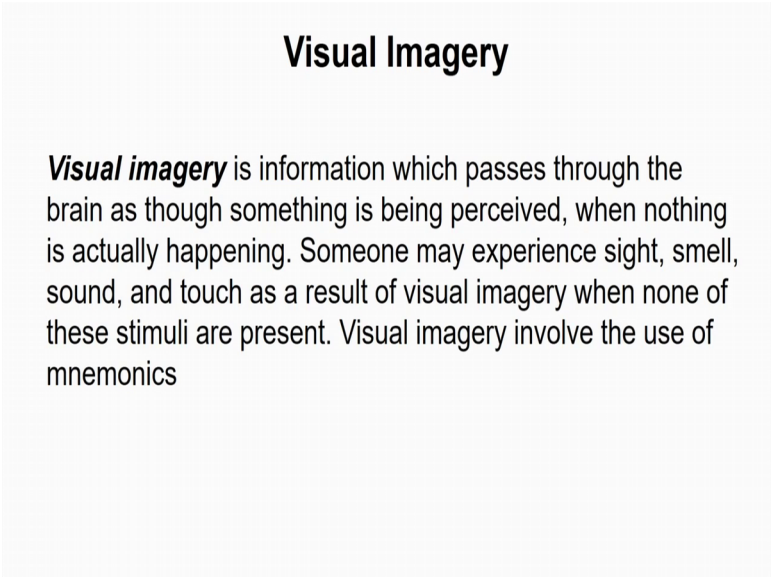

So, let us begin this section on visual memory. So, what is visual imagery? Visual imagery is basically information which passes through the brain as the something is being perceived, when nothing actually is happening. So, when I gave this task of looking at or the window cell, or counting the window cells or looking at the wall in your house and telling me what is on the wall what you did was you imagined these you started perceiving this right you started mentally going back to this and then thinking about it.

And so the process of mentally going back was similar to what perception is minus the input from the eye all other processes are same and I related before in this introduction that Coslins scanning techniques or Coslin work on scanning where visual scanning represents or showed through FMRI that same areas of the brain get activated when you are visual imagining as when you are perceiving minus the input.

So, more or less the same areas get activated right and so these are FMRI studies, which had been done on people when they are imagining something, and when they are actually perceiving something. So, basically someone may experience, height, smell, sound, and touch as a result of visual imagery when none of these stimuli are present.

Basically visual imagery also similar to visual imagery you can have different imageries also for example, you could also have imagery of smell. So, when you imagine good food, or when you imagine eating a pizza, that is called the smell imagery or when you imagine some dog barking auditory imaginations or touch imaginations where you have when you imagine that somebody touches you or something touched you that is Hap tic imaginations.

And so visual imagery is not confined itself to the visual domain, the imagery can also happen in different domains. So, imagery is a process which is exactly many frustration or which is basically a complete replica of the perception process, but minus the input system.

Now visual imagery involves the use of mnemonics, now visual imagery it furthers the use of mnemonics and these mnemonics actually help us in organizing knowledge, and remembering knowledge better into improve recall. So, if visual mnemonics these are techniques of organizing knowledge, or basically saving knowledge and so once we can

do that we can also use this mnemonic techniques to remember information better. Look at this particular figure and then I ask you what do you see?

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So, pretty sure by now you are come answer to what you are seeing so it looks like a piece of a cake or it also looks like some kind of sponge bob kind of a animal which has a carrot coming out, or a haunt coming out of the nose and it has it is kind of a birthday thing. So, this is this is like a complex picture or this is a many frustration which is there.

But most people would have imagine something or other out of it this is the idea of imagination when I show you this picture you think about something, or you imagine something to it. So, you could imagine to be anything it could be a party situation, it could be sponge bob square pants, or it could be person having a birthday blast, or it could be 2 legs here, 2 hands here, the eye with the nose here, 2 eyes or it could be this is the birthday cap that it has and so on and so forth. So, n number of imaginations n number of things and then what you are thinking about it the reply that you are giving to me is based on your imagination.

So, what is mental imagery good for one of the best things with this mental course or mental representation is it enhances recall it helps you in organizing knowledge and enhancing recall. And one way to do it is through using mnemonics and making mental codes out of it. So, what are mnemonics these are basically a process of making mental

representation in the visual format and then help us in organizing information and recalling them better.

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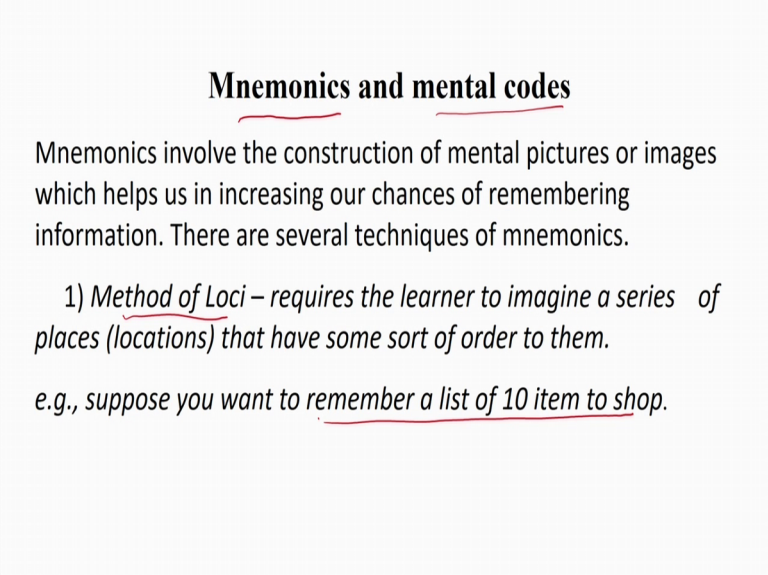

So, mnemonics involve the construction of mental picture of images which help us in increasing our chances of remembering information. So, as I said before it helps us in mentally creating a mental picture or something right. So, when I say imagine a coffee you created a mental picture of it and so that is what mnemonics also does it helps you helps you to create a mental picture. And what does this mental picture then do it helps in better remembering information and there are several techniques on mnemonics which are which can be used.

And so what we will do is will use or will see some of the techniques in this particular session in this particular lecture. And one of the first and most famous technique the of mnemonic that have been used for creating mental code, and for remembering things together for organizing information is called the method of loci.

Now what is the method of loci? Method of loci it requires the learner to imagine a series of places, locations that has some sort of order to them. So, in this case what happens is if a large bit of information has to be imagined what I do is I create a mental image of a house or a number of locations and, then tag each information into these locations.

For example, if I have a lot information to remember let us say I have a list of words to remember. So, what do I do I then remember a place, I then remember or I then imagine a my house, and several things in this house and then go ahead and tag each of this list of words on to these places. So, next time when we when I think about this house the tag the word with the house come back to (Refer Time: 15:00).

So, imagine a case where you have been given 10 items to basically bring from the shop. So, suppose you want to remember a list of 10 items to shop and so we often when we get in this situation we forget some of these items out of the 10 item at least 2 items we are bound to forget. But if you use mnemonics we will never forget because these are visual codes of remembering.

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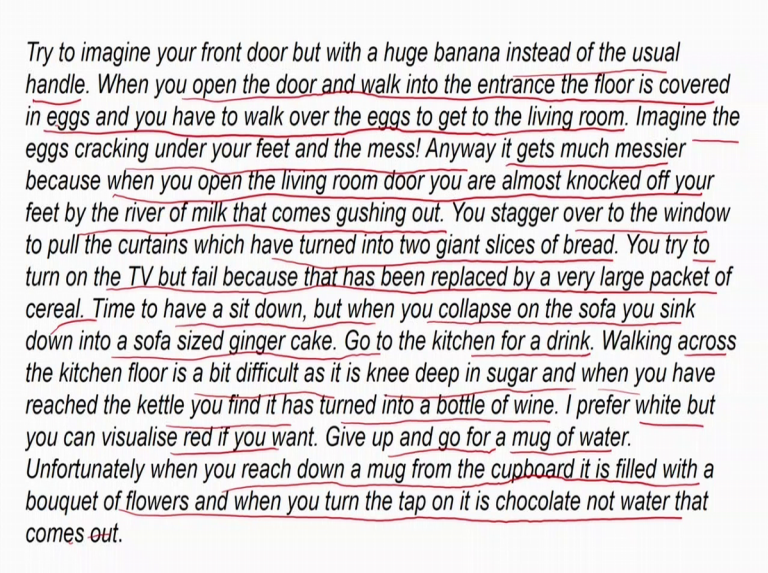

So, let us say there are 10 items that we need to remember. And so these are the 10 items that we need to memory in a shopping list.

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For example, bananas, eggs, milk, bread, cereal, cake, sugar, wine, flowers and chocolates so 10 different items which have been given to us and we need to go ahead and remember all of this and then do shopping for this while returning from our work.

So, how do I remember all these items? Now since there are 10 items and the limit to short term memory is 7 plus or minus 2 so that chances are that I will forget some of these. So, how do I make sure that I do not forget any of these item one way of doing this is using a method of loci, a mentally creating a method of loci for it and for that I have created a imaginations space a visual imagination.

So, try imagining your front door but with a huge banana instead of the visual handle. Then when you open the door and walk into the entrance the flow is covered in eggs and you have to walk over the eggs to get into the living room. So, I am just creating an image first.

And then we will transform that into image then imagine the eggs cracking under your feet and the mess anyway it gets much messier because when you open the living room door you are almost knocked off your feet by the river of milk that comes gushing out. You stager over to the window to pull the curtains which have turned into two giant slices of bread then you try to turn on the TV but fail because that has been replaced by a very large packet of cereal.

Time to have a sit down, but when you collapse on the sofa you sink down into a sofa sized ginger cake. So, the kitchen you go to the kitchen for a drink. Walking across the kitchen floor is a bit difficult as the knee deep in sugar and when you have reached the kettle you find it has turned into a bottle of wine. Now I prefer white but you can visualize whatever color wine you want to.

Now, give up and go for a mug of water unfortunately when you reach down a for the mug from the cupboard it is filled with a bouquet of flowers, and when you turn to the tap on it is chocolate not water, but chocolate comes out of it. So, I created a scenario like this, I created a picture like this, and see these are the 10 items which I want to remember so then this is the mental picture.

So, there is where the banana is here where the eggs is which is cracking these are the window curtains which are now like a bread the TV turns out to be something where a giant cereal box and. So, I am sitting in the sofa which looks more or less like a ginger, bread I am sorry and then this water turns out to be wine and chocolate comes out of the my tap and here are flowers.

So, what I have done is I have taken all these things and put him into this figure. Now next time when I am all although this is very hilarious figure so next time when I am into the shop I just have to remember this figure and this is called the method of loci what I have done is each location the door is a location.

And now associated the banana with it similarly curtains is location on which I have tied on the bread and similarly TV is a location on in your house which I have tapped up to be the now the cereal. Similarly if the so far is a location on to which I have made the ginger bread and the other locations as well.

So, this is the method of loci where what I do is a very famous plays a plays which I am very familiar to is taken and then items which have been learned on to or which you want to learn on that is staged on to each place on to these location and this is the method of loci. So, where it is a funny pictures and it is very easy to remember.

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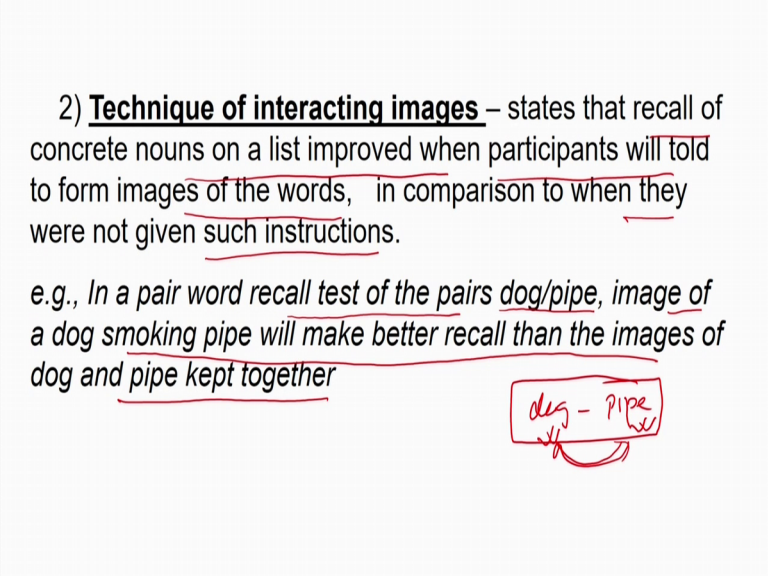

A next technique that can be used for using out or using visual code is called the technique of interacting images. So, here it is very simple what we need to do is stays that the recall of concrete nouns on a list is improved when participants were told to form images of the words in comparison to when they were not given such instructions.

And so the technique of interacting the images say that when we have to learn words in a list it is better to form mentally imagery of the noun concrete nouns and then interact and make an interaction between different words in a noun for example, in a paired word recall test of the pairs dog and pipe dog and pipe where the item of this paired recall test.

So, if that is to remembered what the easiest way to do is to remember the image of a dog and to imagine the image of a pipe and then to interact this picture together, imagine the picture of a dog which is smoking a pipe, and I just wanted to image of a dog smoking a pipe will make better recall then images of the dog and the pipe kept together the reason is that it is funny and it is no word. And so your humor is one of the easiest way of remembering things.

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So, instead of then thinking about the dog separately and the pipe separately I can think about a dog smoking a pipe and this basically is the easiest way. So, dog is basically a concrete noun and pipe is basically a concrete noun. So, what I have done is I have created a image where dog and pipe interacting together or dog smoking pipe, dog smoking pipe and this is much easier or much better way to remember.

So, technique of interacting images says that if you have a number of concrete nouns or imagine this nouns, and then make images of these nouns interacting together and that is an easy way to remember things.

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3) *Peg word method – it involves picturing the item with another set of ordered "cues" – pegging them on the cue. In this case the cues are not locations but rather nouns that come from a memorized rhyming list.*

Number	Pegword	Number	Pegword
One	Bun, gun, sun	Eleven	Lever
Two	Shoe	Twelve	Elf
Three	Tree	Thirteen	Thirsting
Four	Door, floor	Fourteen	Forking
Twenty	Twinty, Plenty	Sixty	Witchy
Thirty	Dirty	Seventy	Heavenly
Forty	Warty	Eighty	Weighty

A third method which is not so visual which does not use uses visual imagery for remembering can also be used and this method is called the peg word method. So, what we do here is that it involves picturing the item with another set of ordered cues pegging them on to the cue.

So, basically if in this case what we do is there is an ordered list that we know and we then peg the new item on to the ordered list. Now in this case the cues are not locations, but rather nouns that come from a memorized list. So, in case of the method of loci there are certain nouns certain locations which I have been used.

So, use the door as a location and the banana on to the door in this case we do not use locations rather we use a number of concrete nouns which comes from a memorizing list. So, those lists that we learned when we are in very small in class nursery and all so those lists are there. So, we can go ahead and un tag or basically peg a new word on to those list and we can remember and so a good example is here. So, all of you know this list.

So, we know one two three four five six seven eight kind of a thing and so one is now related to the word bun, two is related to shoe, three is related to tree, 4 is related to door. Similarly twenty is related to twenty, thirty is related to dirty, forty related to warty, eleven to lever, twelve to elf, thirteen to thirsting, fourteen to forking, sixteen to witching, seventy to heavenly, and eighty to weighty.

So, basically what we are done since we know there was also rhymes called one two buckle my shoe, three four shut the door, five six pick up the stick kind of a thing. So, basically these are memorized list. So, we know one two three four five six something which is taught to us very early on or a for apple, b for ball, c for cat, d for dog.

So, a b c d is a structure which we know beforehand or one two three four is a structure which we know beforehand and so when we want to learn a list of concrete noun we peg them together we tag them together. Now one part the cue part of the list is coming from memory and it is a memorized list the target part is what we peg on to and so, since the cue is easier the cue is memorized tagging the target is easier for us to remember this paired recall.

And so this is the third method and so these method does not use imagery because what we are doing is we using a memorized list, where as the first two methods used imagery the third memory is not using imagery because it is using some kind of memorized list for remembering.

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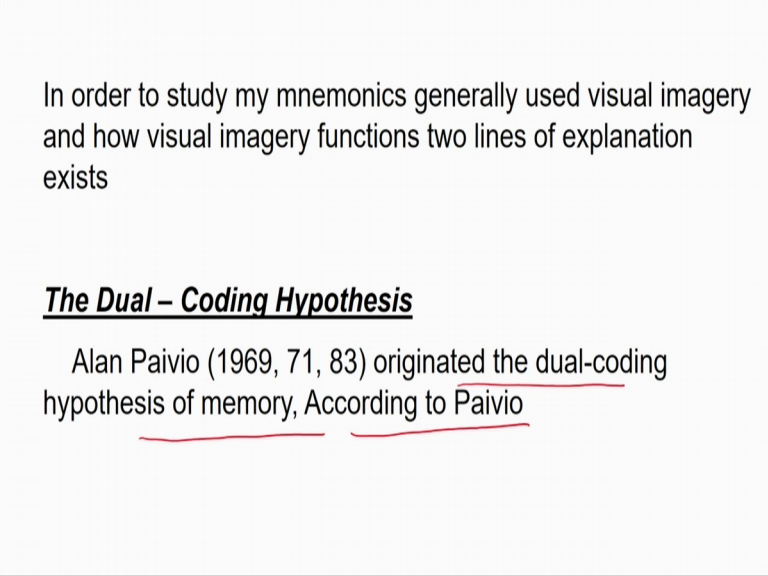

Now in order to study mnemonics generally used visual imagery and how visual imagery functions, there are two ways of explaining how this mnemonics really work the what is the way in which the mnemonics actually go ahead and work.

And so how do they lead to better recall now one of these approaches of how mnemonics actually work is provided by Alan Paivio in his book in his 1983 book which is mental representations at dual coding approach. Now his book talks about how mental representations are what mental representations are? And so what Alan Paivios in very simple words what is proposal is originated from the dual coding hypothesis of memories.

So, he gave a dual coding hypothesis of memory where which he says is the main reason for mnemonics to work. So, why did mnemonics actually work? Why do making mental imagery of things actually work in terms of better remembrance is because there is something called the dual coding approach which is proposed by Alan Paivio.

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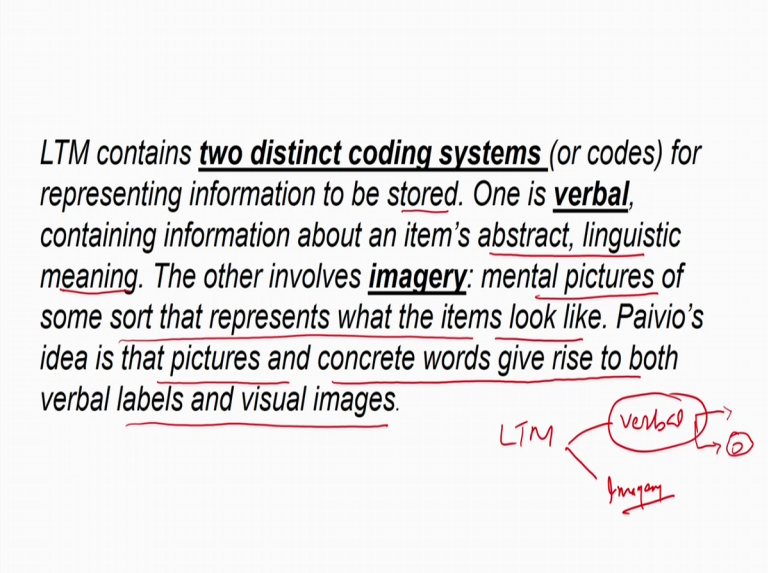

And what is this idea that he propagated he says that the LTM contains two distinct coding systems. So, the long term memory has not just the semantic coding system there is another coding system which is out there for representing information to this store. So, Alan Paivio believes that the LTM uses two different codes for storing information one of it is called is in the verbal domain. So, one code which is used by the long term memory for storing information is verbal which contains information about an items abstract linguistic meaning.

So, those meanings which are abstract, those meanings which are semantic in nature, those meanings which are linguistic in nature are generally stored as the visual code. And

the other involves imagery the mental picture or some sort the that represents what the item looks like. So, remember in the concept in categorization we looked at the best way of conceptual categorization was the exemplar method.

And so looking at exemplar how do you remember the exemplar. So, exemplar has certain features certain abstract features that are verbal in nature and then it has a visual feature also for example, how do we remember a car, we can remember a car by it is model and also certain abstract features for example, it has engine has 4 doors, 4 windows, it has seat for sitting, it is the method of transposition and so these all these methods are or all these features verbal in nature, but the model of the car that comes to mind when you are thinking about it is visual in nature.

And so what he says is there are two basically codes in LTM the verbal is basically abstract linguistic meaning and the imagery there is the mental picture of some sort of representation then the item looks like, how does it look like what is the example of it. Now Paivios idea is that picture and concrete words give rise to both verbal labels and visual images.

So, when you imagine something there are two codes that actually run, there are two different ways or two different formats in any kind of remembrance in any kind of story that happens in memory one is the visual and the other is verbal label.

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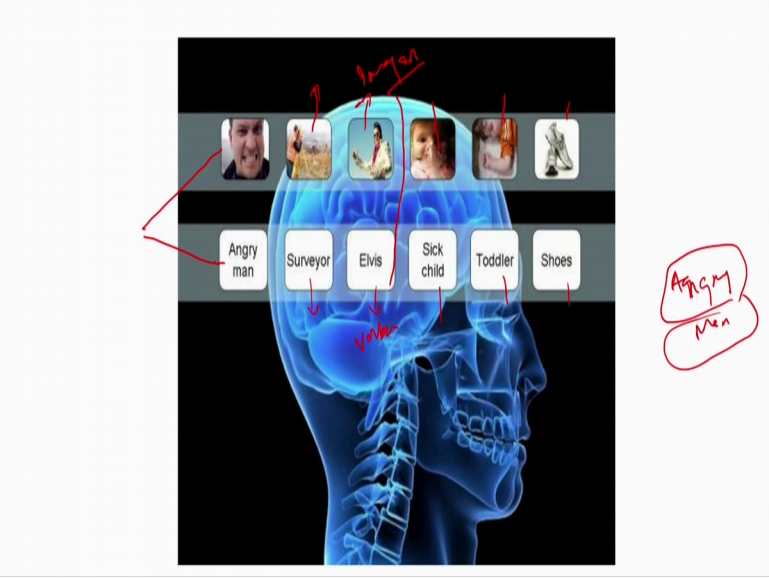

So, when I am thinking of an angry man, when I am ask to remember an angry men, what my LTM does it not only flashes the word angry man, but it also flash the model this angry man model or this person who looks angry also. When we are looking at the word surveyor I am also mind your brain also looking at this kind of a thing when I am thinking about Elvis bracelet my mind is also having an image of it and so this is the verbal label, and this is the imagery label and so they combine together to form the final coding LTM.

So, my LTM then stores two codes for everything a visual code and a imagery code. The verbal code is the one in which the linguistic abstract propositions, stored on to and the imagery code is exactly example of it. So, when I am thinking of a sick child this is the image that I am thinking or toddler this is what the image comes to shoes this is what the image comes to and so, what Alan Paivio says is these two codes interact together to form the final representation or final imagery that happens in long term memory.

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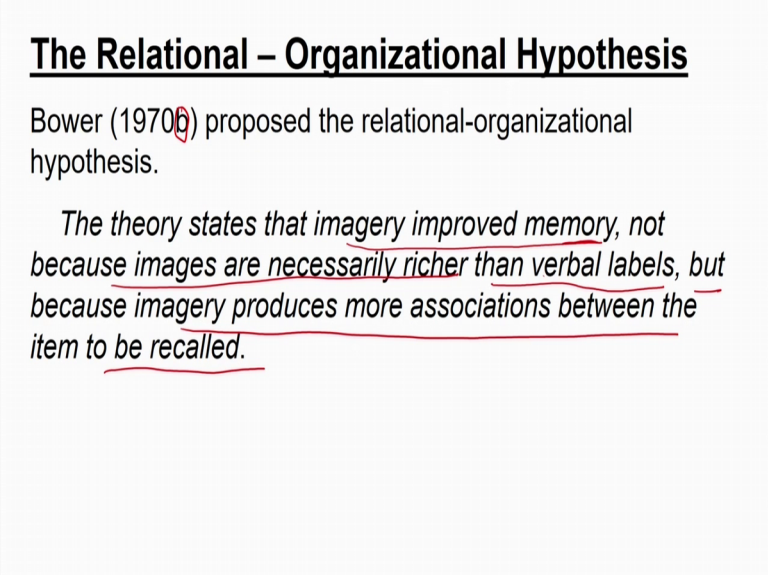

Now in addition to what Alan Paivio says in his dual coding hypothesis that there are two codes the visual code. And the verbal code which actually go ahead and form the representation in memory there is another explanation to it which is called the relational organizational hypothesis.

And so what is the relation organizational hypothesis? This hypothesis was presented by Bower in 1970b I am sorry the b is the study which I am talking about. So, in 1970 he

published 2 papers, and one paper was not on the relation organizational hypothesis. b is the reference to this paper.

So, in 1970 he proposed the relational organizational hypothesis and what is the hypothesis say it is the theory states that imagery improved memory not because images are necessarily richer. So, the reason why imagery improves memory is not because images are rich then verbal labels. It is not that images are richer in the sense it can be thought of it can be imagined. or it can create some model a visual model of it not that reason then verbal label, but because imagery produces more associations between the items to be recalled.

Now, when I think about imagine about something it lends itself to a number of works when I am think about something, when I imagine something, when I imagine about a particular picture, or a particular fact, and a number of hooks are made a number of connections are made number of associations are made.

So, when I think about a sick child the word sick child will not be that much better then the idea that when I think about a sick child think about a image of a sick child when I do that a number of associations will be formed of what his condition about so many so many other variables which are there and so that will lead to better remembering it.

So, when the word sick child comes in front of me it is not a better code, but when a face of a sick child comes into me it will associate with it the emotion picture will and that is why it is said that picture speak a thousand words it will give so many different associations not only for fact that whose this child is why is he sick what is the sick like and so on and so forth.

So, it relates so many information out of it and that is the reason why it is better. So, forming an image typically requires a person to create a number of links or hooks between the information to be remembered and the other information and that is what I said when you imagine something when I imagine a sick child it is not just the sick child were that or the idea that I am thinking about or the idea that the child is sick when I am seeing an image of a sick child there are so many things I am imagining.

For example, I am imagining a positive non positive about him I am feeling a sad mood. When I am seeing a sick child also I am thinking about what kind of disease does he

have? How does he look like? Where does he come from? What are his back ground? What are his parent like? What is his age whether he is Casian or whether he is an Asian or what kind of other things which is there.

So, thinking about a sick child or imagining a sick child will create. So, many associations and so many different cues for it to be remembered then just the word we sick child. Because the word sick child has a meaning related form but the picture of a sick child will create a number of cues on to it.

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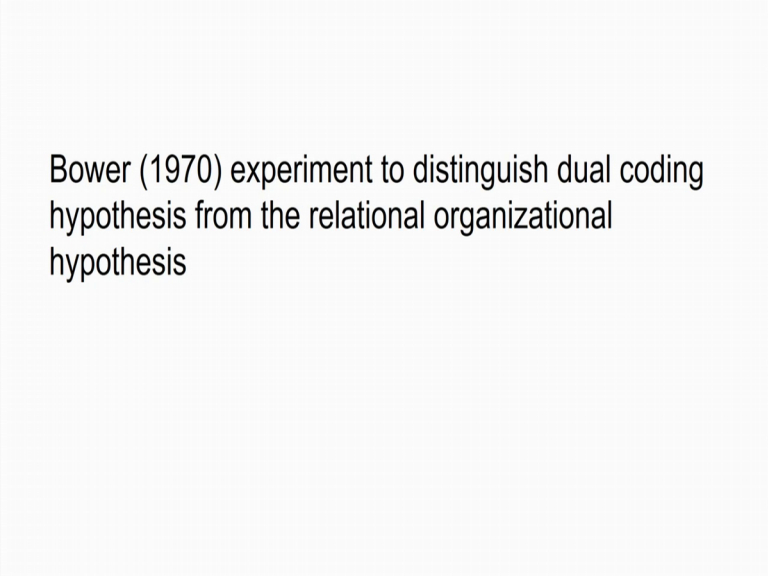

So, Bower in 1970, he do an experiment to distinguish dual coding hypothesis from relational organizational hypothesis and what's the experiment like. So, what he did was he gave people 2 letter words to start with also to he gave people 2 letter words to start with. And so this 2 letter words were either to be remembered just as words, to be remembered just as images, or to be remembered as interacting images.

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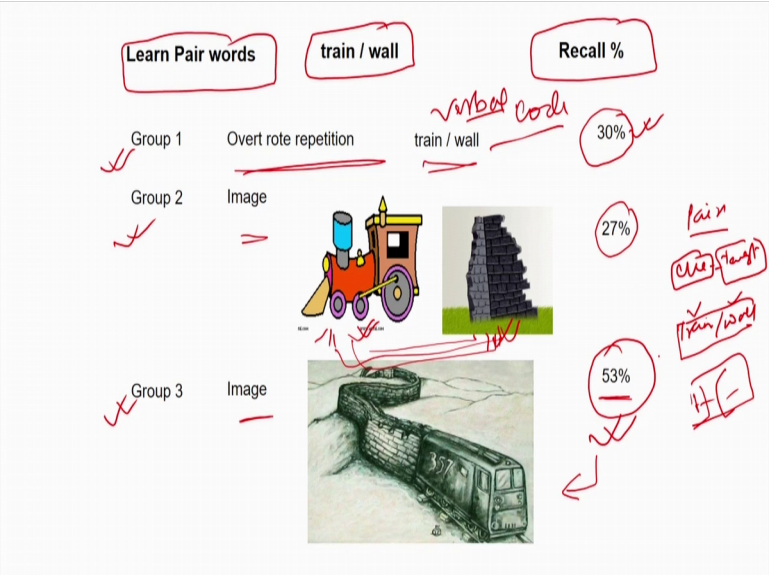

And so in a paired recall test this is the experiment that he did in he Bower gave people or subjects to remember word pairs right and so first group so this is the word pair that the people had to remember. So, train and wall is the word pair that people had to remember.

Now there are 3 groups which were asked to do that in the first group the reason overt what role repetitions of people will be shown train and a wall and they will be asked to recall this word pair and so this is just one entry of the list there are several entries which are there. So, first group will only see the train in a wall and this is a verbal code. So, people have been shown this verbal code and they have been asked to do role repetitions to remember this or to learn this by heart.

Group 2 saw 2 images one they saw a train the other say saw a wall and so these people were shown images of both the cue target. So, mostly in my paired associate learning I have a cue word, and a target word. The cue word is a one which comes before the target is the one which is connected to the cue word.

So, in my train wall my train is the cue word and the wall is the target word. So, when I say train you will have to say wall or when I present train you will have to present come up with the answer of wall. Similarly in this case in the first group people were make to learn the verbal code for train and wall in the second group people were shown a train

and a wall which are not interacting with each other and they were asked to remember the whole list in this way.

A third group was there where an interacting images was made. So, in this case a train and a wall face together. So, now I see a train coming out of the wall so this looks like a great wall of china and a train format will be there and so this is the interacting image and so later on a recall of this word paired list was done and what was the answer to this or what was the result of this people who did remote did not do these associations or learned the list through verbal code.

They produce 30 percent they were efficient 30 percent of the time and their accuracy was 30 percent whereas, people who just leaned separate images their recall was not better or their recall was worse than the recall of people who did rota repetitions or which learn the list through a verbal code.

But people is formed interacting images they produced the highest number of accuracy rate of 53 percent which basically means that when people use images and interact images the a more number of hooks are there. Here the images have a number of hooks, but they are not connected, but here what has happened is one image hook is not related to the other image hook and so a number of cues are now present.

And so train wall could be very easily remembered for it and so this is Bowers experiment in which what he found out is that the more number of hooks that I have the better the repetition or better the recall of a test like this and so, his idea is that why imagery is better is because it lends itself to forming a number of hooks, number of remembering paradigms.

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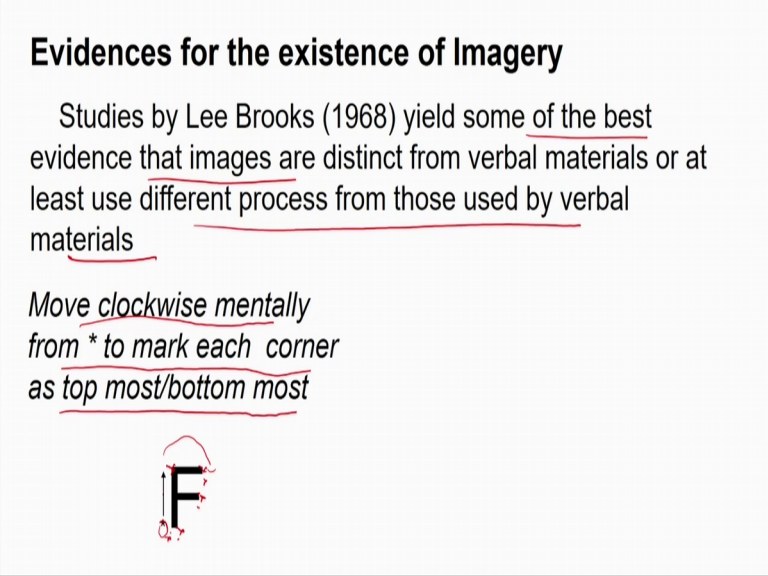

Now what is the existence of imagery? So Lee Brooks in 68 they yield some of the best evidence that images are distinct from verbal materials or images are better than verbal materials or at least use different processes then the verbal materials. So, Lee Brook did a number of experiment; some experiments to show that verbal materials are better than verbal materials and they use the verbal and the visual materials used different codes for tagging.

So, in one of these experiments a letter like this was presented to people and then asterisk sign was there and so what people were asked to do is to mentally move right so this is the an arrow and mentally move anticlockwise. So, move clockwise mentally from star to mark each corner as the top most and bottom most that is there.

So, you have to give an answer and they were two ways to give an answer first what you have to do is look at this F start from the asterisk sign move clockwise mentally to mark each corner. So, these are all corners as the top most or the bottom most corners so that is what you have to do this corner, this corner, this corner, this corner, this corner, this corner, this corner you have to tell me whether these corners are the top most or bottom most.

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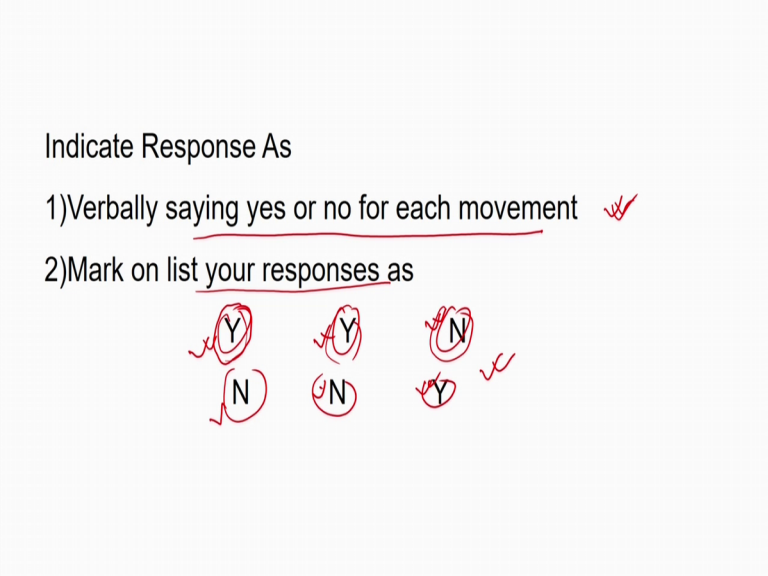

So, the answers of this has to be provided in a response sheet like this either people have to say verbally yes or no or people have to mark their answers into Y, Y, Y, N, N, N. So, each time when you go from corner to corner whether this is the top most bottom most you have to put a circle like this on to Y on N one way of responding the other way of responding was verbally say yes and no right.

So, this is one experiment in the other experiment people were asked to indicate for each word whether it is concrete noun or not concrete noun. So, people were asked to relate back whether each word in this a bird in the hand is not in the bush and so relate back whether each of this particular word is a concrete noun or is not a concrete noun and that is what you have to do that is what was supposed to be done and same example here the same kind of response here what do you think happen, what was the result of the experiment like this.

Now, the result of this experiment was people who will use imagery people who was mentally moving things together. These are better off in terms of circling this y and n rather than verbally presenting an answer and people who were asked to relate back the concrete noun those people were better of saying verbally yes and no rather than say circling Y and N with basically proves that there are two different codes.

When you are doing something mentally when you are doing a job mentally when you are rotating mentally in a clockwise direction and finding out whether any corner is the

top most bottom most. Then in those cases visually this is a using visual imaginations to visually marking is better produced, better accuracy then in the case in which you are verbally verifying a sentence, and finding out whether a noun is concrete or not and answering also verbally and so that was the answer to it.

So, people in the spatial location people in the F verification, spatial verification visual imagery exist it basically visual imagery is present and they help us visual imagery helps us in remembering things better in helps us in better remembering. Also certain other tasks which were used to form to basically show that visual imagery exist and so one of this is comparison task.

And so people were asked this questions whether a truck is bigger than a car, a truck is bigger than a bicycle, or a truck is bigger than a van. Now if these questions were asked people were faster in telling a truck is bigger than bicycle then telling those basically relating those giving answers to those questions we says that truck is whether it related to a van or not.

So, whether truck is bigger than a van the answers were slow in comparison to those questions in which it was asked whether truck is related to a bicycle the answer here is that people create mental images of a truck and a bicycle and do the comparison.

So, when we are creating mental images of a truck and a van they almost look similar and so comparisons are slow a number of comparison has to be done and. So, the answers are slow, but when we are looking at a bicycle and a truck there are too many differences in it and so the comparison is faster and much better and much smoother than in the first case and this is basically call the symbolic distance effect which basically means that if two items are other a part or have greater distances in comparison standards they are first verified in terms of mental imagery then when they are close together in a particular comparison standard.

So, basically in this section then what we did was we looked at what is mental imagery, we saw what mental images are and we also saw what is this kind of code as I said before we have looked at different codes and here we looked at another interesting code which the LTM has is called visual imagery.

we also looked at some very interesting ways of helping you remember a number of things or helping you perform better in exam by using mnemonics and I showed you 3 different techniques which are there one of the technique is the method of loci what it tend to do is imagine a play that you know a very well and then a tag on the list of words that you want to remember on to certain locations on that list.

A second method is called peg word method in which what you tend to do is remember a number in the peg one method in wrote memorize list and so, you peg whatever has to be remembered into particular list that you already remembered peg the new word on to that and third model or basically a third a way of method mnemonic method is the interacting image during in which what you do is make 2 images and make them interact together.

And once you make an interacting image of 2 images that will be better remembered or that will help you into better remembrance. We also saw evidences of the fact that imagery does exist and if imagery exist that we saw that if a task is of particular type then a particular kind of imagery or a particular kind of response is better. We also saw the certain reasons of what how imagination or mnemonics really works.

So, there are two ways of looking into it either looking at Alan Paivio's idea of interacting images of two different codes how they interact together or the idea of Bower where he proposes the relational hypothesis, where he says that interacting images are much better than the simple mere images, simple mere solitude images.

So, we conclude this section here. We will again continue with section in the next lecture, for now goodbye.