

**Memory**  
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**Lecture - 38**  
**Mnemonics**

Hello, I welcome you all to the lecture series on memory. As we studied earlier about the underlying neural mechanisms of various memory processes, today let me introduce you to the concept and idea of mnemonics. The idea of mnemonics is that it's a tactic which helps a person improve their ability to remember things. It helps them remember information for a long duration of time, and this technique seems to be an ancient one, originating from Greek culture. This memory technique helps your brain not only encode information but also recall it more easily when encoding improves.

This applies to encoding and recalling important information. Information that holds crucial details and components to execute tasks and achieve our goals. Now, this detailed information has unique properties and characteristics. Hence, a technique is required to retain these unique characteristics of information in a better, systematic, and organized way. As you can see, the word 'mnemonics' starts with two letters, 'MN'.

This beginning comes from the Greek goddess of memory, Mnemosyne. The second part, 'monic,' comes from the word 'harmonica,' 'harmonic,' or 'harmony'. This suggests that if there is harmony in the information one has to encode or recall, or in the encoding process itself, this technique works. It provides assistance and aid to a person in retaining crucial and relevant information for a long period of time. An example of this can be seen with the colors of the rainbow.

As you can see on the screen, the cartoon is showing the rainbow colors. These colors start from one end to the other, beginning with red and ending with violet. Between this range of colors from red to violet, several different wavelengths of colors are present. If we start from red, then the sequence is red, orange, yellow, green, blue, and violet. Sometimes, to remember these colors, we start from violet: violet, indigo, blue, green, yellow, orange, red, which we call 'VIBGYOR.'

So, most of us have learned this sequence of the rainbow colors. There are seven colors. One, two, three, four, five, six, seven. Here, what we are saying is that if there is

harmony, the letters can be separated as 'ROY G BIV.' This made-up name can be remembered later.

It can be remembered for a long period of time. And how have we done this? We have done this using a technique of creating a meaningful word. Now, such a process has been discussed earlier regarding chunking. Where a meaningful word can be chunked together, providing ease for users to remember.

Like logi and psycho. Bio, logi. Bio and logi. Similarly, we also studied neuropsychopharmacology. Now, we know that such long words cannot be remembered easily.

So, we have chunked them into four: neuro, psycho, pharma, cology. Okay. So, the first use of mnemonic devices, as I was telling you, dates back to the Greek period. The Greek poet Simonides introduced this method, which is still used today. The method he introduced is association.

If people make an association while remembering words, it lasts longer. There should be a locus, a center, and around that center, the words must be tied or knotted together. According to legend, Simonides gave a speech at a banquet sponsored by Scopus. Scopus organized this event where Simonides not only gave a speech but, instead of praising Scopus,

Or talking about the achievements and things related to Scopus, he was praising only the gods. Scopus got upset and then he decided not to pay the money to Simonides and he paid him only half the amount. This angered the god and he killed all the guests except When Simonides was left alone in that place, he started to remember the people who were present there at that time so that he could provide the information to the family members of those people who died at that event.

Not only was the concern to provide the information to the family members, but he But in order to remember the people present there, he used the method of loci. The method of loci, to this day, is being used in order to remember information. And Simonides memorized the seating arrangement of the people, keeping one person at the center, And then the other members, all the members, their positioning, he tried to associate it with the loci.

Now, and this is what people generally do, in order to remember a series of letters, a series of words, they try to anchor at one point. And that is what Simonides also did. He

used his imagination technique. The method of loci seems to be using imagery-based learning. Imagination is being used.

In this imagery-based learning, the goal is to capitalize not our only good visual memory, but this good visual memory is aiding us in learning more difficult, ambiguous, complex verbal information. Now this ambiguous information or complex information or difficult problems need to be remembered for long period of time but if you visualize them then this visualization seems to be long lasting. There is a strategy is used to associate the difficult to be learned information with the existing well known visual memories. So if any complex information is coming to the individual to learn, then the individual try to use this complex information and try to associate with the existing visual information.

The existing visual memories try to then, with this association, try to make the information long-lasting. So here the visual imagination or visual association seems to be very beneficial for the people to learn and remember the complex information. Now, imagery-based learning, though forming a strong association between the two new information, which is ensuring that the encoding will be good, but we have to also understand, same time, the same visual memory is going to be shared by other information as well.

Though we try to associate the visual existing memory with the new information in a unique way, but still the chances of overlap, the chances of similarity is very high. Though they may not be identical in nature. The method of loci. If you see a cartoon on the right hand side, this image is having several components and elements in it. And you will see that the elements have been numbered as 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13 and 14.

14 items have been localized. So the method of locale, what it does, using a visual imagery method to associate this new list with well-known spatial locations. So what you see on your screen are locations. These visual locations need to be associated and learned. Similarity with the particular landscape is important.

So if you are familiar with the landscape, it assists you in the learning and making a person respond quick and fast. The new items to be learned can be anything like a grocery list. Each one of us has a long list of groceries when we go to the market. And to remember each and every item present on that list is a very tedious and complex task. Imagine when you forget this list at home, then the task becomes more complex in nature.

So how individual remember the list of items is they associate the items on the list with well-known location, environmental landscape. So if this map which you are seeing where the 14 elements have been identified and located, similarly the information in our brain is having a spatial map where these items seem to be located. So if the locus is the front gate, this is the front gate. If locus is the front gate, which you are referring as the bed, the entrance you are referring as the butter, the window you are referring as salad dressing, the door knob as a toilet paper. So the items, bread, butter, salad, toilet paper.

If these four items need to be brought in, this information is associated with the special map of your house. Similarly, people try to map this information, mapping the list of items with the context. Or the mental landscape for ease. This detailed description of the method of loci has also been mentioned in detail in *The Art of Memory* by Luria in 1969. So, another method is the keyword technique.

The keyword technique, as the word itself indicates, involves providing the relevant word, the important word, And once you have those important and relevant words, they may help you in recall. It may even help you in encoding. So here we employ visual imagery. Where paired association, or paired associate learning, is used to form new vocabulary.

And this new vocabulary is foreign language vocabulary. Most of the time, bilingual or multilingual individuals, when learning a third or second language, find visual imagery and paired association to be major contributors and helpful in this regard. Creating an image that represents a word in the language. So, for a particular word, an image is retrieved. An image is assigned.

And when we talk about the selection of the image, this image provides an aid to the individual to learn new words. Now, the word in the language that we are learning. So many times a new word is there, and the word which exists in your own language is also there. So sometimes people image a word, bringing that image of a word from their language to the L2 or L3.

Now, the Spanish word 'árbol,' for instance, meaning 'tree,' can be linked with the English word 'arbor,' meaning a grove of trees. So, the word 'árbol,' meaning 'tree,' can be associated or linked with a grove of trees. So in English, the word 'arbor' means a grove of trees. In Spanish, when 'árbol' is there, when only the letter L or R is changed, the same image can be used in learning the second language, which in this case is Spanish.

Now, another technique that people have been using, like the method of loci, is the peg-word mnemonic.

This utilizes not only the visual but also the auditory memory system. Here, both systems—the visual memory system and the auditory memory system—are doing the handshake. So first, we should know the auditory list. Like all the teachers from elementary school, from kindergarten to fifth grade. We need the auditory list.

Then, to remember the items, they are associated with the name of the teacher. Then, we do the comparison. Supplementing the sounds by forming images related to the name of the item on the list. Such as, salad is green. So, we are providing the image to the item itself.

So here also, what we are saying is: one is a gun, two is a shoe, three is a tree, four is a door, and so forth. So, to investigate this concept and idea of the pegword technique, Parve conducted a simple experiment. which helps initial encoding, but subsequent memorization is better than by a more meaning-driven encoding. We have to understand that the information which has more meaning in it seems to be long-lasting. The information which has less meaning in it and is ambiguous and complex in nature seems to be forgotten very easily.

The trace consolidation of meaningful information, familiar information, or dominant or high-frequency information seems to be long-lasting. So, in this pegword technique, what do we do? We associate letters with the image or with the information. So, letters are being associated with the image. One is a gun.

Two is a shoe. Three is a tree. Four is a door, five is a hive, six is a stick, seven goes to heaven, eight is wheat, nine is red wine, ten is a pen. Such associations, such learning, and such peg work techniques provide assistance to individuals who need to learn and remember huge amounts of information. Now, it is important for us to also understand interactive versus bizarre imagery.

Many times, the imagery learning we have discussed could be very bizarre in nature. And sometimes, these imageries are very interactive. So, which is longer lasting? Where we remember the information longer than the other. So, bizarre imagery is not a mnemonic but a memory aid.

Bizarre imagery is not a technique to remember information, but it provides a memory aid. What is it? What kind of aid does it provide? Let us see with the isolation effect. Create a visual, one false, resolve effect—the isolation effect.

which takes advantage of the visual imagery and the power of distinctiveness to improve memory. So when we talk about the distinct characteristics of the item, you can see a four-wheel pram. But here, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. Twelve-wheel pram. This is bizarre.

This is distinct. but here, another three-sided axe. So this is a one-sided axe, and this is a three-sided axe. Now, one point we are discussing is the distinctiveness. So this is very distinct from this.

Three-sided axe, one-sided axe. 12-wheel pram, 2-wheel pram, 4-wheel pram, sorry. And this distinctiveness provides an aid to the individual to remember. William Webber and Lowry in 1972 asked their participants to use bizarre interactive imagery, such as this three-sided axe. And these interactive images, if not bizarre, lead to the best memory recall.

If they are not bizarre, this is a very interactive image. As a result, the unique and distinct information that this three-sided axis has ensures better recall. The recall is going to be highly accurate compared to non-interactive images or rote encoding. So what have we studied in this? We have studied the name mnemonics and where it comes from, the technique, and how this technique was first used by the Greek poet.

And how he used it, the method of loci, to remember these words. We also discussed imagery-based learning. We learned about the keyword technique. Furthermore, we discussed the pegword mnemonic and how it contributes to remembering relevant information for a long period of time. And the information which is more interactive,

And the information which is bizarre in nature seems to be long-lasting. So either the uniqueness is there, the distinctness is there in the information or the list of items, or the information is more interactive. So if an individual has to learn a list of items and when negative words start to appear in the list of positive or neutral items, This bizarre imagination, this dissimilarity, makes the individual remember the information long-lasting. Or else, if the list of items is more interactive, people seem to engage themselves, then also this recall and encoding seem to be better in nature.

Bizarre imagery can be seen as a surprising element also. And once the surprising element is there, then the encoding and retrieval become effective and accurate in nature. With this, we end this session here. In the next lecture, we will start with memory reconsolidation and the boundary conditions of memory. Thank you.