Effects of Rehearsal and Imagery on STM Recall

Rehearsal acts as a buffer between memory and Long Term Memory, by maintaining information within the Short Term Memory. The effects of repeated presentation depend on whether the repeated stimulus is merely processed to the same level, or encoded differently on its further presentations.

The Serial Position Effect is the likelihood of remembering any word, depending on its position in the list. Better recall of the words early in the list results from Primacy Effect. They get rehearsed and stored in the Long Term Memory. Therefore, this proves that rehearsal increases the chance of remembering. Words towards the end of the list are still in the Short Term Memory so are also easily recalled.

Imagery is different to verbal memory and is defined as the creation of a mental picture. It helps with the organization of the memory, and the more bizarre the image, the more likely we are to remember it. Paivio (1971) agreed, proposing that the processing of words and images occurs separately. Concrete words are encoded twice, once as verbal symbols and again as image-based symbols. Therefore, this increases the likelihood that they will be remembered. This is similar to the processing involved with the Working Memory Model, where oral memory is stored in the Primary Acoustic Store, whereas images are collected in the Visuo-Spatial Scratch Pad. Paivio called this Dual Coding Hypothesis.

The Mnemonic Keyboard was a concept devised by Pressley in 1982. It aims to identify part of a foreign word that sounds similar to an English word, and connecting them with a picture.

Haber (1969) came up with the theory of Eidetic Imagers. Eidetic Imaginers can briefly look at a picture and store it almost perfectly. Later, they can 'read off' the details from the picture without much difficulty. Such imagers are not quite like photographs, as details are sometimes added, altered and deleted. There is evidence to suggest that they only occur when picture content is interesting.

Stomeyer and Psotka investigated the eidetic powers of a young teacher in 1970. She was presented with a 10,000 dot pattern for one minute to the right eye and after ten seconds, to her left eye. When asked to

superimpose the two images, she correctly explained that she saw the letter 'T' coming towards her. This supports this theory.
Bruner identified three models of thinking: enactive, iconic, and symbolic (which appear in this order during development). Iconic thinking or the use of images is another feature of individual differences, but is used to some extent by all people.

Cognitive Maps: this term originated with Tolman who suggested that even rats seem to have a 'mental picture' of where they are and where they want to get to when negotiating a maze.
Von Frisch (1967) proposed that honey bees use when communicating the location of pollen to other bees.
Saarinen (1987) found out that when college students where asked to draw a map of the World they enlarged the areas where they came from or which were important to them, one Australian drew the map upside down.

Computational Models: the current focus of interest. For example, Kosslyn (1980) described how visual images can be represented in a special, spatial medium.
There would be two forms of data structure: image files (a skeletal outline and co-ordinates to position it) and propositional files (which contain information about components and their interrelations).

Visual Memory: recognition of pictures is extremely high, supporting a visual mode of thinking. Shepard (1967) showed subjects 612 'memorable' pictures. He then showed them 98 pairs of pictures, one of which was new. Subjects were able to identify 99.7% of the original of pictures after two hours and even 120 days later by some individuals.
Stroymeyer (1970) tested one eidetiker, 'E', with sets of computer-generated dots. She was first shown one set and later another set. Taken together the dots produce a three-dimensional image, which E was able to see in her 'mind'.

According to the working memory model (Baddeley, 1986), human verbal short-term memory performance, as studied in immediate aerial recall (ISR) tasks, depends on the articulatory loop, which consists of a phonological store for verbal material, and mechanisms that enable rehearsal. The model assumes that rehearsal is necessary for performance of ISR. Consequently, it cannot account for the existence of serial recall without rehearsal, evidenced in children (Gathercole, Adams and Hitch, 1994).

Association, Imagination and Location

The three fundamental principles underlying the use of mnemonics are:

- Association
- Imagination
- Location

Working together, these principles can be used to generate powerful mnemonic systems. This Mind Tools presentation will show illustrations of many memory techniques and examples of areas where their application will yield serious advantage. Hopefully once you have absorbed and applied these techniques you will understand how to design and apply these principles to your field to design your own powerful, sophisticated recall systems.

These principles are explained below:

Association

Association is the method by which you link a thing to be remembered to a method of remembering it. Although we can and will suggest associations to you, your own associations are much better as they reflect the way in which your mind works.

Things can be associated by:

- being placed on top of the associated object
- crashing or penetrating into each other
- mergeing together
- wrapping around each other
- rotating around each other or dancing together

- *being the same colour, smell, shape, or feeling*
- *etc.*

Whatever can be used to link the thing being remembered with the image used to recall it is the association image.

As an example: Linking the number 1 with a goldfish might be done by visualising a 1-shaped spear being used to spear a goldfish to feed a starving family.

Imagination

Imagination is used to create the links and associations needed to create effective memory techniques - put simple, imagination is the way in which you use your mind to create the links that have the most meaning for you. Images that I create will have less power and impact for you, because they reflect the way in which we think.

The more strongly you imagine and visualise a situation, the more effectively it will stick in your mind for later recall. Mnemonic imagination can be as violent, vivid, or sensual as you like, as long as it helps you to remember what needs to be remembered.

Location

Location provides you with two things: a coherent context into which information can be placed so that it hangs together, and a way of separating one mnemonic from another: e.g. by setting one mnemonic in one village, I can separate it from a similar mnemonic located in another place.

Location provides context and texture to your mnemonics, and prevents them from being confused with similar mnemonics. For example, by setting one mnemonic with visualisations in the town of Horsham in the UK and another similar mnemonic with images of Manhattan allows us to separate them with no danger of confusion.

So using the three fundamentals of Association, Imagination and Location you can design images that strongly link things with the links between themselves and other things, in a context that allows you to recall those images in a way that does not conflict with other images and associations.