A: ORGANISATION OF MEMORY

Meyer (1973) claims that to remember is to have organised. This view emphasises the importance of memory organisation (specifically in LTM). Organisation can occur either at storage or at retrieval and can either be imposed by someone else or can be spontaneously organised by the person learning the material. There have been a large number of studies investigating the effects of organisation on recall:

1. Bousefield (1953) claimed that organising in categories (semantically - in terms of meanings) is the natural way to process information in LTM. He gave subjects a list of 60 items to learn. Within this list (mixed up) were 15 names of animals, 15 names of people, 15 professions and 15 vegetables. Subjects were asked to recall in any order they liked. He found that subjects tended to remember the words in clusters of words all belonging to the same category. For example, once they had remembered ‘dog’ then other animals would follow. He concluded that categorical clustering is indicative of semantic organisation in memory.

2. Tulving (1980) claimed that even in the absence of experimenter imposed organisation, subjective organisation (where the learner organises the material for him/herself) occurs. He suggested that even when organisation was not imposed, subjects still actively organised material. Evidence for this was that in free recall studies (where subjects can recall in any order they choose) subjects consistently tend to recall groups of words in the same order, despite changes of presentation order from trial to trial.

3. Mandler (1967) claimed that if you organise something you will learn it. He asked subjects to organise a set of cards, with a word on each, into seven columns. He told half the subjects that they should learn the words, but did not tell the other half to do so. He found that when subjects were asked to recall, the subjects who were not asked to learn the words could recall them just as well as those who were told to learn them. He therefore suggested that organisation is equivalent to learning.

4. Bower et al (1969) also demonstrated the power of organisation. Subjects had 112 words to learn, presented in 4 trials, 28 words a trial. Half the subjects were presented with the words organised into conceptual hierarchies (see Figure 1), the other half were simply shown lists of words. They found that subjects presented with the organised lists remembered around 47% more words than subjects presented a list without organisation.
Figure 1: Bower et al (1969). Example of words organised in conceptual hierarchy

<table>
<thead>
<tr>
<th>MINERALS</th>
<th>METALS</th>
<th>STONES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RARE</td>
<td>COMMON</td>
<td>ALLOYS</td>
</tr>
<tr>
<td>Platinum</td>
<td>Aluminium</td>
<td>Precious</td>
</tr>
<tr>
<td>Silver</td>
<td>Copper</td>
<td>Masonry</td>
</tr>
<tr>
<td>Gold</td>
<td>Lead</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Restle (1974) proposed the degree of organisation principle. This suggested that the better we organise new material (relating it especially to existing knowledge), the better we will retain it.

6. Collins & Quillian (1969) developed a model of memory based on semantic organisation. Their model was an example of a network model of semantic memory. A network is a structure consisting of a set of nodes with links or paths interconnecting them. For example, the knowledge that an ostrich is an animal or that a fish can swim is represented in a network like that shown in Figure 2.

Figure 2: Collins & Quillian’s (1969) model of Semantic Memory Organisation

At the highest level there are a small number of general concepts, at the bottom are many specific concepts. For further information and an evaluation of this model see Gross, p.342-345.
Generally the idea is that long term memory is organised and, if you want to have a better chance of remembering something, then you need to organise material, at the time of storage and at the time of retrieval. Take note of this for revision purposes!

B: MEMORY & MNEMONICS

Mnemonics are memory aids: techniques that can be used to help remember things. Many mnemonic strategies are based on imagery, which is a form of memory organisation. What all mnemonics have in common is that they either reduce or elaborate the way information is encoded: they either strip away irrelevant information so that only the very minimum is needed or they elaborate the information to be stored through imagery or verbally. There are a large number of mnemonic strategies, just a few are described below.

- **Method of loci**
  This can be traced back to Greek and Roman orators who used the method to remember the order of topics they intended to cover in a long speech. The method consists of mentally placing each one of a list of to-be-remembered items in a well-known place (locus) such as the rooms of a familiar house or buildings along a street. A mental ‘walk’ then serves to retrieve the items in the correct order. This method reliably produces increased recall. This technique was one of many used to great effect by the famous mnemonist Sherevshevski (Luria, 1968), who used to imagine a familiar street in Moscow and then place items he had to remember along the street. When he forgot any item it was usually because he had placed it in a dark corner or had imagined it against an indistinguishable background!

- **Peg Words**
  This method of learning a word list entails first learning a peg list of rhyming pairs (see Box 1) and then hang the to-be-remembered list of words on the pegs by means of interactive imagery. For example, if the first word you have to remember is cigarette, then you imagine a cigarette crushed out on a bun; if the next is elephant, then you imagine a big fat elephant wearing patent leather shoes; if the next is scarf, you imagine a scarf tied around the trunk of a tree ..... and so on.
• **Narrative Chaining**
This is also referred to as story linkage. This method involves a list of words being linked together to form a story. Bower & Clark (1969) found that when subjects were instructed to memorise a list of words by organising the words into a story their recall increased by at least 50%. Box 2 gives an example of the words used and a possible story used to link them.

**BOX 2: EXAMPLE OF NARRATIVE CHAINING (after Bower & Clark, 1969)**

(words to be remembered are in capitals)

There was a BREAK in the storm and the LIGHT came back on. A MOUSE came out of its hole to take a LOOK at the CAKE she was eating. Its SPINE tingled so it ran away FAST to the haySTACK.

• **Initial letter mnemonics**
This technique is an example of a verbal mnemonic. With this method, a sentence is constructed whose initial letters can be used to remember a list of important items. For example, “Rowntrees Of York Give Better In Value” can be used to remember the order of the spectral colours (red, orange, yellow, green, blue, indigo, violet). Another example is On Old Olympus Towering Top A Finn And German Viewed Some Hops: this can be used to remember the twelve cranial nerves
(Olfactory, Optic, Occulomotor, Trigeminal, T?, Abducens, Facial, Auditory, G?, Vagus, Spinal accessory, Hypoglossal). The trick here is to remember what goes with the initials: not always easy! A reductionist form of this is the use of acronyms. An instance is the acronym ROYGBIV, a further aid to remembering the colours of the rainbow. Another example is the acronym CRAPFRS that you use to remember the seven factors influencing imitation (Social learning theory).

- **The PQRS method**
  This mnemonic technique is one that might be useful to you when it comes to studying material which involves remembering a short list. It consists of four stages:

  (i) **Preview** - examine what you are reading, looking a headings, words in bold, etc, so that you can grasp what topics are covered and get a general idea of what it is all about.

  (ii) **Question** - formulate questions so you know what information you are aiming to extract from whatever it is you are reading.

  (iii) **Read** - read the material, actively seeking the answers to your questions.

  (iv) **Summarise** - summarise what you have read, preferably in your own words.

The main feature of this technique is that it firmly links remembering with understanding: this is a theme that we keep coming back to! Remembering without understanding is a waste of time! Long-term retention and the ability to adapt what you know to answer a whole range of questions is only achieved by understanding and elaborating the meaning of whatever you are trying to remember and organising the material so that it can be readily retrieved when required.

- **Mental Imagery**

  This technique involves linking item that are to-be-remember with a mental image, so that the two words are interacting in some way. For example Bower (1972) showed that asking subjects to form a mental image of unrelated nouns (e.g. dog and hat, so that they imagined a dog wearing a bowler hat) resulted in significantly better recall than when subjects were instructed merely to memorise the words. Bower considered that the more unusual the image the better.

  *For further details of mnemonics, particularly a case study of a mnemonicist (Luria’s Sherevshevsks), see Gross, pg. 353.*