

# The effectiveness of interacting mental imagery in associate word pair recall ess...

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In previous research (Bower 1970; Roediger III, 1980) found that mnemonic systems improve recall ability, and the results of this study support these findings. The objectives of this study were to examine whether the mnemonic system of interacting mental imagery improved recall of a list of word pair associates in comparison to overt rote word repetition. The method employed was a between-groups design in which the participants (68 first year psychology students) had their recall tested using one of the two methods. The results of the recall test supported the hypothesis that using interacting mental imagery would improve recall. These findings show in certain circumstances such as to remember orders, mnemonics are very useful, but are limited when information is organised or meaningful, then gaining an understanding is the best way to remember.

#### The Effectiveness of Interacting Mental Imagery in Associate Word Pair Recall

Mnemonic systems are a well-researched area in psychology, and refer to the special techniques consciously used to improve memory. They work by organising new information into a cohesive whole so that retrieval of part of the information ensures retrieval of the rest of it. The information stored is more elaborate, but makes the material easier to recall. Past studies have shown support for the theory that mnemonic systems improve recall (Bower, 1970; Roediger III, 1980). Roediger III's experiment studied the classic mnemonic systems of the method of loci, in which items to be remembered are mentally associated with a specific location, the peg system, which involves the association of items to be remembered with a set of mental pegs already stored in memory. It also looked at the link method, where each item is converted into interacting images, forming an associate chain of

interacting images supporting the recall of items in the appropriate order, and finally mental imagery, the construction of mental pictures that link isolated (or paired) words in a list.

This study confirmed that mnemonic systems did aid recall when compared with a control group, and that peg and loci methods performed the best when stricter marking was employed. This study has close links to Craik and Lockhart's (1972) theory of "Levels of Processing." This theory asserts that there are two types of rehearsal used, and that they don't necessarily result in the establishment of long-term memories. The first type of rehearsal is maintenance rehearsal, and is the rote repetition of verbal information (the 'repetition' condition in this experiment) this maintains the information in short-term memory, but does not automatically result in lasting memory. In contrast elaborative rehearsal (the 'imagery' condition in this experiment) involves deeper processing such as forming associations, attending to the meaning of information and thinking about the information. Thus recall is improved by recollecting related information already stored in long-term memory.

Moreover this experiment discovered the level of analysis to be an important factor in storing memories, and this is a factor in the current experiment. The 'repetition' condition features shallow processing compared to the deep processing of the 'imagery' condition, and according to Craik and Lockhart (1972) deep processing leads to better retention than shallow processing. The aim of this experiment is to examine whether mnemonic systems using interacting imagery increase recall of a list of twelve pairs of word

associates. This study is a partial replication of Bower's (1970) "Imagery as a Relational Organizer in Associative Learning" experiment. The Bower (1970) study found mental imagery improves paired associate learning relative to overt rehearsal. The study found that word plus imaginal code increased recall as it is a more distinctive, isolated and outstanding stimulus complex than the word alone, and this means the "paired items are more resistant to intralist generalization from other pairs in the list, so the associations suffer less interference and recall is higher" (Bower, 1970, p. 529). Moreover the reliability of encoding is a major factor in recall, and imaginal encoding of a stimulus word is more reliable than verbal encoding. This is because the functional cues in verbal encoding vary, from letters to phonemes for example, and this lowers recall ability. Moreover other studies have found that interaction in the imagery is a very important factor in recall (Wollen, Weber & Lowry, 1972). The Wollen et al. (1972) study found that interaction in the imagery is even more effective when relevant to word pairs, this is in comparison to non-interacting and bizarre images.

It is therefore key that the mental imagery group is instructed to use interacting images to ensure the mnemonic is used correctly and at its most efficient. Being a partial replication of Bower's (1970) work it is expected the experimental results should support this and therefore the hypothesis for this study is that recall will be higher for participants in the interacting mental imagery condition than the word repetition condition in relation to a list of twelve associate word pairs. Method Design This experiment used the 'between-groups' design. The independent variables 'repetition' and '

imagery,' were the two conditions of the survey where 'repetition' participants used overt rote word repetition to learn a list of word pair associates and 'imagery' participants used an interacting mental image to learn the associates.

The dependant variable was the number of correct responses. ParticipantsA total of sixty-eight first year psychology students from the University of Bath took part in this survey. The participants were aged between 18 and 35, with 50 females and 18 males. The participants were split into two groups, the first 'repetition' group had 46 people with an average age of 19. 11, and 23.

9% males compared with 76. 1% females. The second 'imagery' group had 22 people with an average age of 19. 14, with 31. 8% males compared to 68.

2% females. MaterialsEach participant had a protocol sheet (Reisberg, Gleitman ; Gleitman, 2004). This gathered the participant's demographic information such as their sex and age. They had to confirm what condition they were in (the 'repetition' group were condition 1, and the 'imagery' group condition 2).

Finally there was space left for their twelve recalled second members of the paired associates. Additionally, there was the list of 12 pairs of nouns (Reisberg, Gleitman & Gleitman, 2004) that was read to both conditions, in the same order, but not handed out to the participants (see Figure 1 in the appendix). A stopwatch was also used to time the gap between each pair of words as they were read out. ProcedureBefore the lecture in which the experiment occurred the class was divided into two groups. It was decided a

systematic random sample would be the best way to divide the participants, as it would give groups with a wide range of learning styles and memory abilities.

The split was done by the date of birth of each participant; odd birthdays were in condition 1, whilst even birth dates were in condition 2. The two groups came to the class at different times and upon arriving the groups were read aloud their instructions (see Figure 2 in appendix for the verbatim instructions each group received.) The list of 12 paired associates was then read out to each group, with a six second pause between each pair of words (the order of the pairs was the same for both conditions). The protocol sheets were then distributed out to the participants. One of each of the associated words was read to the participants, and they were asked to recall its pair word (the order of pairs was made different from the original reading, so participants didn't remember pairs through order, the new order being the same for both conditions).

Participants were then asked to mark their own answers when the experiment had finished, with words recalled that were very similar to their associate allowed, but had to be checked with the assessor, an example is dishtowel and tea towel. Participants were then debriefed, being told what they had just done and why, and had any of their queries answered and finally thanked for their time. ResultsThe summary of results for this experiment is found in Table 1, which shows the average recall score for the associated word pair test. The 'imagery' condition had the higher average recall score of 9.86, compared to the 'repetition' condition's average of 5.

72. An independent T-test revealed there was a significant difference between the averages for 'imagery' and 'repetition' and so the hypothesis was supported. In both conditions some participants recalled the full 12 pairs. As Table 1 shows however, the minimum recall scored differed in the two conditions, 'imagery's' lowest score was 2, compared with 0 in 'repetition' further supporting the hypothesis, that it is harder to recall the paired associates using repetition.