

Levels of Processing

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Saul McLeod, published 2007

The levels of processing model (Craik and Lockhart, 1972) focuses on the depth of processing involved in memory, and predicts the deeper information is processed, the longer a memory trace will last.

Craik defined depth as:

"the meaningfulness extracted from the stimulus rather than in terms of the number of analyses performed upon it." (1973, p. 48)

Unlike the multi-store model it is a non-structured approach. The basic idea is that memory is really just what happens as a result of processing information. Memory is just a by-product of the depth of processing of information, and there is no clear distinction between short term and long term memory.

Therefore, instead of concentrating on the stores/structures involved (i.e. short term memory & long term memory), this theory concentrates on the processes involved in memory.

We can process information in 3 ways:

Shallow Processing

- This takes two forms

1. Structural processing (appearance) which is when we encode only the physical qualities of something. E.g. the typeface of a word or how the letters look.

2. Phonemic processing – which is when we encode its sound.

Shallow processing only involves **maintenance rehearsal** (repetition to help us hold something in the STM) and leads to fairly short-term retention of information.

This is the only type of rehearsal to take place within the multi-store model.

Deep Processing

- This involves

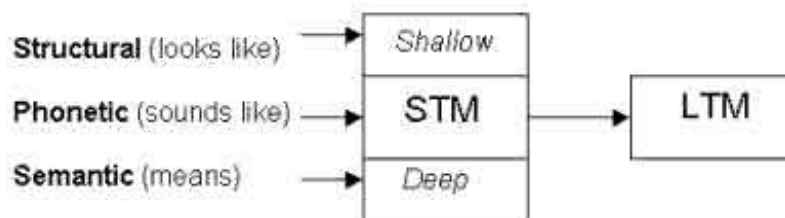
3. Semantic processing, which happens when we encode the meaning of a word and relate it to similar words with similar meaning.

Deep processing involves **elaboration rehearsal** which involves a more meaningful analysis (e.g. images, thinking, associations etc.) of information and leads to better recall.

For example, giving words a meaning or linking them with previous knowledge.

Summary

Levels of processing: The idea that the way information is encoded affects how well it is remembered. The deeper the level of processing, the easier the information is to recall.



Key Study: Craik and Tulving (1975)

Aim

To investigate how deep and shallow processing affects memory recall.

Method

Participants were presented with a series of 60 words about which they had to answer one of three questions. Some questions required the participants to process the word in a deep way (e.g. semantic) and others in a shallow way (e.g. structural and phonemic). For example:

Structural / visual processing: 'Is the word in capital letters or small letters?'

Phonemic / auditory processing: 'Does the word rhyme with . . .?'

Semantic processing: 'Does the word go in this sentence?'

Participants were then given a long list of 180 words into which the original words had been mixed. They were asked to pick out the original words.

Results

Participants recalled more words that were semantically processed compared to phonemically and visually processed words.

Conclusion

Semantically processed words involve elaboration rehearsal and deep processing which results in more accurate recall. Phonemic and visually processed words involve shallow processing and less accurate recall.

Real Life Applications

This explanation of memory is useful in everyday life because it highlights the way in which elaboration, which requires deeper processing of information, can aid memory. Three examples of this are.

- **Reworking** – putting information in your own words or talking about it with someone else.
- **Method of loci** – when trying to remember a list of items, linking each with a familiar place or route.
- **Imagery** – by creating an image of something you want to remember, you elaborate on it and encode it visually (i.e. a mind map).

The above examples could all be used to revise psychology using semantic processing (e.g. explaining memory models to your mum, using mind maps etc.) and should result in deeper processing through using **elaboration rehearsal**.

Consequently more information will be remembered (and recalled) and better exam results should be achieved.

Critical Evaluation

Strengths

The theory is an improvement on Atkinson & Shiffrin's account of transfer from STM to LTM. For example, elaboration rehearsal leads to recall of information than just maintenance rehearsal.

The levels of processing model changed the direction of memory research. It showed that encoding was not a simple, straightforward process. This widened the focus from seeing long-term memory as a simple storage unit to seeing it as a complex processing system.

Craik and Lockhart's ideas led to hundreds of experiments, most of which confirmed the superiority of 'deep' semantic processing for remembering information. It explains why we remember some things much better and for much longer than others.

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Weaknesses

Despite these strengths, there are a number of **criticisms of the levels of processing theory**:

- It does not explain how the deeper processing results in better memories.
- Deeper processing takes more effort than shallow processing and it could be this, rather than the depth of processing that makes it more likely people will remember something.
- The concept of depth is vague and cannot be observed. Therefore, it cannot be objectively measured.

Eysenck (1990) claims that the levels of processing theory describes rather than explains. Craik and Lockhart (1972) argued that deep processing leads to better long-term memory than shallow processing. However, they failed to provide a detailed account of why deep processing is so effective.

However, recent studies have clarified this point - it appears that deeper coding produces better retention because it is more elaborate. Elaborative encoding enriches the memory representation of an item by activating many aspects of its meaning and linking it into the pre-existing network of semantic associations.

Later research indicated that processing is more complex and varied than the levels of processing theory suggests. In other words, there is more to processing than depth and elaboration.

For example, research by Bransford et al. (1979) indicated that a sentence such as, 'A mosquito is like a doctor because both draw blood' is more likely to be recalled than the more elaborated sentence, 'A mosquito is like a racoon because they both have head, legs and jaws'. It appears that it is the distinctiveness of the first sentence which makes it easier to remember - it's unusual to compare a doctor to a mosquito. As a result, the sentence stands out and is more easily recalled.

Another problem is that participants typically spend a longer time processing the deeper or more difficult tasks. So, it could be that the results are partly due to more time being spent on the material. The type of processing, the amount of effort & the length of time spent on processing tend to be confounded. Deeper processing goes with more effort and more time, so it is difficult to know which factor influences the results.

The ideas of 'depth' and 'elaboration' are vague and ill defined (Eysenck, 1978). As a result, they are difficult to measure. Indeed, there is no independent way of measuring the depth of processing. This can lead to a circular argument - it is predicted that deeply processed information will be remembered better, but the measure of depth of processing is how well the information is remembered.

The levels of processing theory focuses on the processes involved in memory, and thus ignores the structures. There is evidence to support the idea of memory structures such as STM and LTM as the Multi-Store Model proposed (e.g. H.M., serial position effect etc.). Therefore, memory is more complex than described by the LOP theory.

References

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