**Levels of processing model Craik and Lockhart (1972)**

Craik and Lockhart were very critical of models like the MSM. They argued that there was too much emphasis on distinguishing between different memory stores. Furthermore, control processes were only briefly identified to explain the flow of information between memory stores. Craik and Lockhart were more interested in how information was processed. They did not explicitly deny the existence of different memory stores but they completely ignored the idea that we may have different memory stores. They felt more substantial progress in memory research could be made by investigating in detail how information was processed early on, in particular, during its initial encoding, rather than how it transfers from one store to another.

**What are the levels of processing?**

Craik and Lockhart believed that information could be encoded and processed at different levels. The level at which it is processed (shallowest to deepest) accounts for the likelihood of it being learned and remembered -the frequency of rehearsal is not important.

These questions demonstrate the levels of processing

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Answer: Yes | Answer: No | Level of processing |
| Is this word in upper case? | TABLE | table | Visual appearance |
| Does this word rhyme with ‘fad’? | mad | train | Acoustic |
| Is salmon a fish? | yes | | Semantic |

**Depth of processing**

Information can be processed at any of the above three levels but the depth of processing will change.

* Shallowest: words are processed visually in terms of physical appearance.
* Deeper: words are processed acoustically ( sometimes as well as the physical appearance).
* Deepest: words are processed semantically.

Main theoretical claims

* Memory is a by-product of perception. Memory is a direct consequence of the way information is encoded.
* The initial analysis of incoming information is carried out in **primary memory** by a limited capacity **central processor**. The processor can handle information very flexibly. The way it is handled is determined partly by the nature of the information itself, and partly by the purpose of remembering. For example, if we are trying to remember a number for a few seconds while we dial, the material will be handled acoustically. However, if we are trying to understand what someone is telling us, the material will be handled semantically.
* The **deeper the level of processing**, the stronger, more durable and long lasting the **memory**.

**Evidence** Craik and Lockhart, (1972):

Participants were asked a series of questions, like in the table above, which involved visual, acoustic and semantic phrases. The participants **were not told to memorize** the target words. Following the initial task, participants were tested to see if they had learned the target words. They were surprised with a list of words containing words already presented to them and new words. The participants had to recognize the items already shown to them-this is called a **memory recognition test**.

Findings were that words presented at the semantic level were best remembered, followed by acoustic followed by visual. These findings support the idea that the deeper the processing, the better the memory for these items.

**Elaborative rehearsal:**

The MSM suggests that the more times information is rehearsed, the more likely it will be remembered. In contrast, Craik and Lockhart suggested that how well information is remembered depends not only on the level of processing, but also on how **complex or elaborate the processing** is within each level. They also believed that **rehearsal** only lead to long-term memories if it was elaborative-involved some sort of **analysis or evaluation**.

**Evidence** Craik and Tulving, 1975**:**

Participants were presented with sentences containing a blank space followed by a word.

For example:

“She read the ……newspaper” (simple sentence)

“The great bird swooped down and carried off the struggling…..chicken” (complex sentence).

They were asked if the word after the space fitted in the space. Craik and Tulving, 1975 assumed that the more complex the sentence the more elaborate the processing would be.

Findings: Participants were later shown the sentences without the additional words. This time they were asked to remember the word that had accompanied each sentence. Recall was twice as high for words accompanying complex sentences, suggesting that elaboration improves long-term memory. Craik and Tulvig argued that the words had to be more **thoroughly processed to fit into a complex sentence** and, as a result, they became easier to remember. It was not just whether semantic encoding took place that was important, but also the amount of elaboration.

**Evaluation**

(+) This model shows that encoding is not a simple straightforward process. The LTM is not a simple storage unit, but a complex processing system.

(+) Many experiments have confirmed the superiority of deep semantic processing for remembering information.

(-) The ideas of depth and elaboration are vague and not well defined. As a result they are **difficult to measure**. It **describes rather than explains memory**. For example, why is the semantic level better than the others? Partly explained by the concept of elaborative rehearsal.

(-) LOP does not address the **retrieval stage** of the memory process.

(-) Later research indicated that processing is more complex and varied than the levels of processing model suggests (i.e. there is more to processing than depth and elaboration). For example, semantic processing does not always lead to better retrieval. The **distinctiveness** of certain information can cause it to be remembered better even if it is less elaborate. For example;

“A mosquito is like a doctor because they both draw blood” is more distinctive than

“A mosquito is like a raccoon because they both have hands, legs and jaws”.

**Bransford et al 1979.**