Short-term memory: the second stage in memory processing

Experience, Memories

Introduction toPsychologyPsychology 101, Section 8 October 26, 2010 Short-Term Memory The short-term memory is the lead to our long lasting remembers. Short-term memory is the second stage in the memory processing (Huffman). The short-term memory is the part of the memory that temporarily stores and processes information from the sensory memory and holds it until it decides if the information will be sent to the third stage or long-term memory (Huffman). The short-term memory stores a mixture of perceptual analyses information (Huffman).

The short-term memory works in different ways to increase its small capacity; it uses rehearsal and chunking to be able to remember more things at once (Huffman). Rehearsal is when a person repeats information over and over again to maintain it fresh in the memory and chunking is grouping separate pieces of information into a single group (Huffman). The short-term memory is also known as the " working memory" because it's always receiving information from the sensory memory and sending to the long-term memory (Huffman).

I will be discussing the difference between short-term memory and long-term memory, the theory of decay, and the working memory. Difference The main difference between short-term memory and long-term memory is the capacity that each one has. According to Michael E. Martinez the twomemorieswork together a cognitive architecture or the mind's basic structure. In the short-term memory a person can only think of a few ideas at a time (Martinez). One of the characteristics of the short-term memory is

that is small compare to the long-term memory which has a larger capacity (Martinez).

Information flows between the short-term memory to the long-term memory, depending on the direction and different kinds of thinking results (Martinez). Short-term memory is the route entry to long-term memory or the holding template until the long-term memory processes are complete (Lewis). One example the Martinez gives is when information flows from short-term memory into long-term memory it produces learning. When information leaves flows from long-term memory back to short-term memory is called recognition or recall, which happens whenever we think about a previously known fact, person, or event (Martinez).

Each memory has it's owe limitations; the short-term memory has a small capacity making it hard to think about many things at once, while the long-term memory does not record experience completely and accurately (Martinez). Unlike the long-term memory the short-term memory has chunking, which allows the short-term memory to hold more and more information. The capacity does not change but chunk grows in complexity which allows the short-term memory to handle more data (Martinez). Decay

Decay is a theory that has a long history in accounting for forgetting (Berman, Jonides, and Lewis). This is said to happen because as time passes, information in the memory erodes and is less available for retrieval (Berman, Jonides, and Lewis). Berman, Jonides, and Lewis present different experiment to examine if decay is a cause of forgetting. One study that they present is the classic study of Peterson and Peterson (1959): " Consider the classic

study of Peterson and Peterson (1959), originally thought to provide strong evidence for decay.

In this experiment, participants were given a letter trigram to store, followed by a retention interval that varied from 3 to 18 s. During the retention interval, participants were required to count backward by threes to prevent rehearsal of the memorandum. Following the retention interval, participants recalled the item in memory. Peterson and Peterson found that performance declined as retention intervals increased, and the authors attributed this decline to increasing decay of the memory trace with increasing time.

The attribution of this effects to decay mechanism is, however, suspect. " The arguments that counting backward could not be a source of interference because their secondary task differed from the item to be stored in memory (Berman, Jonides, and Lewis). But the case is that counting task requires short-term memory retention, which is the main memory task (Berman, Jonides, and Lewis). Another problem in assessing the role of decay on short-term memory is the habitual tendency of rehearse materials that are to retain (Berman, Jonides, and Lewis).

An example that Berman, Jonides, Lewis give is when we look up a phone number in the directory and then walk to the phone, we rehearse the number in our head until it is dialed. They are trying to come up with different techniques to prevent rehearsal, to get an accurate gauge of whether decay has an effect on memory (Berman, Jonides, and Lewis). Working Memory Theory based research has revealed that working memory is a system that allows a person to maintain taskgoals, update memory to

meet current demands, and to separate memory to form relationships (Shelton, Matthews, Hill, and Gouvier).

The working memory is also referred to a general purpose system that is responsible for the active task or goal relevant information while simultaneously processing other information (Unsworth, Spillers, and Brewer). The general purpose system includes: problem solving, reading, coordination and planning, and the basic intellectual functions, which leads to research on the capacity of the working memory (Unsworth, Spillers, and Brewer). " Beginning with Daneman and Carpenter (1980), most researchers have utilized complex working memory p tasks in which to-be-remembered items are interspersed with some processing activity. For nstance, in the reading p task participants attempt to remember words or letters while reading and comprehending sentences. These tasks can be contrasted with simple memory p tasks in which TBR items are presented without any additional processing activities.

The complex p tasks nicely capture the idea that the of processing and storage are needed to fully understand the essence of working memory and tap its capacity. Furthermore, these tasks can be used to estimate an individual's working memory capacity and examine the correlation between this capacity and other important cognitive abilities (Unsworth, Spillers, and Brewer). The possible that the complex p tasks do not file overall resources abilities but rather that the processing task displaces items from the working memory (Unsworth, Spillers, and Brewer). Also according to the task-switching view, a person may place an item in the working memory, and a

rapid switching mechanism is needed to refresh the item before it is lost due to decay (Unsworth, Spillers, and Brewer). The faster the information can be complete and switch back to decaying representations, the better the overall performance will be (Unsworth, Spillers, and Brewer).

There is also a difference in the amount of capacity from individual to individual (Unsworth, Spillers, and Brewer). There are two components that individuals may differ on: first component is the need to actively maintain information over the short term and the second is the need to retrieve information that could not be actively maintain due to a large number of incoming items (Unsworth, Spillers, and Brewer). The short-term memory has it's mysteries due to the amount of information that one can keep and pass on.

One thing is for sure is that without it we will not know what information are relevant for one to keep or decay. Now one can understand the relationship and difference between short-term and long-term memory, the theory of decay, and why the short-term memory is the working memory.

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