Globus Journal of Progressive Education
A Refereed Research Journal
Vol 5 / No 1 / Jan - Jun 2015 ISSN: 2231-1335

A STUDY OF FUTURE TEACHING SKILLS

*M. Srinivasulu
*Dr. Nidhi Goel

Introduction

In psychology, memory is an organism's ability to store, retain, and subsequently retrieve information. Traditional studies of memory began in the realms of philosophy, including techniques of artificially enhancing the memory. The late nineteenth and early twentieth century put memory within the paradigms of cognitive psychology. In recent decades, it has become one of the principal pillars of a branch of science called cognitive neuroscience, an interdisciplinary link between cognitive psychology and neuroscience. There are several ways to classify memories, based on duration, nature and retrieval of information. From an information processing perspective there are three main stages in the formation and retrieval of memory:

- *Encoding* or registration (receiving, processing and combining of received information)
- *Storage* (creation of a permanent record of the encoded information)
- *Retrieval* or *recall* (calling back the stored information in response to some cue for use in a process or activity)

A basic and generally accepted classification of memory is based on the duration of memory retention, and identifies three distinct types of memory: sensory memory, short term memory and long term memory.

Sensory memory corresponds approximately to the initial 200 - 500 milliseconds after an item is perceived. The ability to look at an item, and remember what it looked like with just a second of observation, or memorization, is an example of sensory memory. With very short presentations, participants often report that they seem to "see" more than they can actually report. The first experiments exploring this form of sensory memory were conducted by George Sperling using the "partial report paradigm." Subjects were presented with a grid of 12 letters, arranged into three rows of 4. After a brief presentation, subjects were then played either a high, medium or low tone, cuing them which of the rows to report. Based on these partial report experiments, Sperling was able to show that the capacity of sensory memory was approximately 12 items, but that it degraded very quickly (within a few hundred milliseconds). Because this form of memory degrades so quickly, participants would see the display, but be unable to report all of the items (12 in the "whole report" procedure) before they decayed. This type of memory cannot be prolonged via rehearsal. Some of the information in sensory memory is then transferred to short-term memory. Short-term memory allows one to recall something from several seconds to as long as a minute without rehearsal. Its capacity is also very limited: George A. Miller, when working at Bell Laboratories, conducted experiments showing that the store of short term memory was 7±2 items (the title of his famous paper, "The magical number 7±2"). Modern estimates of the capacity of short-term memory are lower, typically on the order of 4-5 items, and we know that memory capacity can be increased through a process called chunking. For example, if presented with the string:

People are able to remember only a few items. However, if the same information is presented in the following way: people can remember a great deal more letters. This is because they are able to chunk the information into meaningful groups of letters. Beyond finding meaning in the abbreviations above, Herbert Simon showed that the ideal size for chunking letters and numbers, meaningful or not, was three. This may be reflected in some countries in the tendency to remember phone numbers as several chunks of three numbers with the final four-number groups generally broken down into two groups of two. Short-term memory is believed to rely mostly on an acoustic code for storing information, and to a lesser extent a visual code. Conrad (1964 found that test subjects had more difficulty recalling collections of words that were acoustically similar (e.g. dog, hog, fog, bog, log). The storage in sensory memory and short-term memory generally have a strictly limited capacity and duration, which means that information is available for a certain period of time, but is not retained indefinitely. By contrast, long-term memory can store much larger quantities of information for potentially unlimited duration (sometimes a whole life span). For example, given a random seven-digit number, we may remember it for only a few seconds before forgetting, suggesting it was stored in our short-term memory. On the other hand, we can remember telephone numbers for many years through repetition; this information is said to be stored in long-term memory. While short-term memory encodes information acoustically, long-term memory encodes it semantically: Baddeley (1966) discovered that after 20 minutes, test subjects had the least difficulty recalling a collection of words

**Research Scholar, Sunrise University, Alwar, Rajasthan*
***Supervisor, Sunrise University, Alwar, Rajasthan*

that had similar meanings (e.g. big, large, great, huge). Short-term memory is supported by transient patterns of neuronal communication, dependent on regions of the frontal lobe (especially dorsolateral prefrontal cortex) and the parietal lobe. Long-term memories, on the other hand, are maintained by more stable and permanent changes in neural connections widely spread throughout the brain. The hippocampus is essential to the consolidation of information from short-term to long-term memory, although it does not seem to store information itself. Rather, it may be involved in changing neural connections for a period of three months or more after the initial learning. One of the primary functions of sleep is improving consolidation of information, as it can be shown that memory depends on getting sufficient sleep between training and test, and that the hippocampus replays activity from the current day while sleeping. Models of memory provide abstract representations of how memory is believed to work. Below are several models proposed over the years by various psychologists. Note that there is some controversy as to whether there are several memory structures, for example, Tarnow (2005) finds that it is likely that there is only one memory structure between 6 and 600 seconds. The multi-store model (also known as Atkinson-Shiffrin memory model) was first recognised in 1968 by Atkinson and Shiffrin. The multi-store model has been criticized for being too simplistic. For instance, long-term memory is believed to be actually made up of multiple subcomponents, such as episodic and procedural memory. It also proposes that rehearsal is the only mechanism by which information eventually reaches long-term storage, but evidence shows us capable of remembering things without rehearsal. In 1974, Baddeley and Hitch proposed a working memory model which replaced the concept of general short term memory with specific, active components. In this model, working memory consists of three basic stores: the central executive, the phonological loop and the visuo-spatial sketchpad. In 2000 this model was expanded with the multimodal episodic buffer.

The central executive essentially acts as attention. It channels information to the three component processes: the phonological loop, the visuo-spatial sketchpad, and the episodic buffer. The phonological loop stores auditory information by silently rehearsing sounds or words in a continuous loop; the articulatory process (the "inner voice") continuously "speaks" the words to the phonological store (the "inner ear"). The phonological loop has a very limited capacity, which is demonstrated by the fact that it is easier to remember a list of short words (e.g. dog, wish, love) than a list of long words (e.g. association, systematic, confabulate) because short words fit better in the loop. However, if the test subject is given a task that ties up the articulatory process (saying "the, the, the" over and over again), then a list of short words is no easier to remember. The visuo-spatial sketchpad stores visual and spatial information. It is engaged when performing spatial tasks (such as judging distances) or visual ones (such as counting the windows on a house or imagining images). The episodic buffer is dedicated to linking information across domains to form integrated units of visual, spatial, and verbal information and chronological ordering (e.g., the memory of a story or a movie scene). The episodic buffer is also assumed to have links to long-term memory and semantical meaning. The working memory model explains many practical observations, such as why it is easier to do two different tasks (one verbal and one visual) than two similar tasks (e.g., two visual), and the aforementioned word-length effect. However, the concept of a central executive as noted here has been criticized as inadequate and vague.

Craik and Lockhart (1972) proposed that it is the method and depth of processing that affects how an experience is stored in memory, rather than rehearsal.

- **Organization** - Mandler (1967) gave participants a pack of word cards and asked them to sort them into any number of piles using any system of categorization they liked. When they were later asked to recall as many of the words as they could, those who used more categories remembered more words. This study suggested that the act of organizing information makes it more memorable.
- **Distinctiveness** - Eysenck and Eysenck (1980) asked participants to say words in a distinctive way, e.g. spell the words out loud. Such participants recalled the words better than those who simply read them off a list.
- **Effort** - Tyler *et al.* (1979) had participants solve a series of anagrams, some easy (FAHTER) and some difficult (HREFAT). The participants recalled the difficult anagrams better, presumably because they put more effort into them.
- **Elaboration** - Palmere *et al.* (1983) gave participants descriptive paragraphs of a fictitious African nation. There were some short paragraphs and some with extra sentences elaborating the main idea. Recall was higher for the ideas in the elaborated paragraphs.

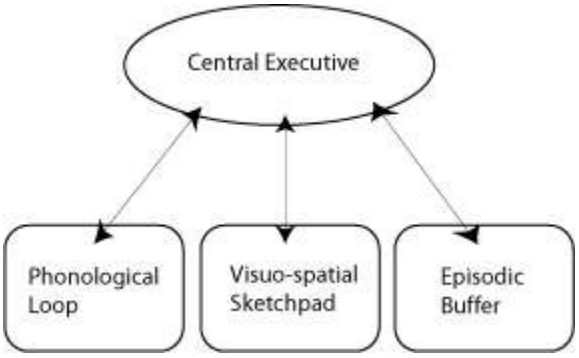

Figure: Schematic of Baddeley's Model

References

1. Baddeley, A.D. (2000). The episodic buffer: A new component of working memory? Trends in Cognitive Science, 4, 417-423.
2. Logie, R.H. (1995). Visuo-spatial working memory, Hove, UK: Lawrence Eribaum Associates.
3. Klauer, K. C., & Zhao, Z. (2004), Double dissociations in visual and spatial short-term memory. Journal of Experimental Psychology: General, 133, 355-381.
4. http://www.psypress.com/ek5/resources/demo_ch06-sc-02.asp
5. Smith, E. E., & Jonides, J. (1997).
6. Baddeley A (November 2000). "The episodic buffer: a new component of working memory?". Trends Cogn. Sci. (Regul. Ed.) 4 (11): 417-423.
7. Baddeley A, Wilson BA (2002). "Prose recall and amnesia: implications for the structure of working memory". Neuropsychological 40 (10): 1737-43.
8. Jones, D. M., Mac ken, W. J., & Nicholls, A. P. (2004), The phonological store of working memory: is it phonological and is it a store? Journal of Experimental Psychology: Learning, Memory, and Cognition, 30, 656-674.