

Memory models



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This essay will explore different types of memory, including short and long term, as well as the mechanisms that are used to help us understand how it works. Furthermore, this essay will be discussing eye witness testimony, its accuracy and how it can be distorted, looking at research and experiments that have been carried out to help us better understand these concepts.

A majority of psychologists agree that there are three main types of memory: sensory, short term memory and long term memory. Short term memory “ holds information for a few seconds until you have used it” (Rice, D. and Haralambos, M. 2000 p06). We try to keep information active in our short term memory by rehearsal, done mainly through acoustic coding (Marshall, M. 2012). If information is not rehearsed it will disappear from short term memory within approximately twenty seconds, this was shown in a study by Peterson, L. R., & Peterson, M. J. (1959). The experiment consisted of participants learning three sets of consoants, however before the recall task, they were asked to count backwards from a three digit number in threes (RICE, D. and HARALAMBOS, M. 2000). Findings concluded that when rehearsal is prevented, information is quickly lost from short term memory. However in this experiment the ecological validity was artificial as the participants had never come across nonsense trigrams before. Furthermore, there were many extraneous variables that could effect the internal validity of this experiment, for example the mental maths ability of the participant would effect the amount of concentration required to count backwards.

Long term memory is limited only by the length of human life. Researchers believe that the coding for long term memory is mainly semantic and

information is coded in terms of its meaning (Rice, D. and Haralambos, M. 2000). In a study by Baddeley, A. d. (1966) participants were given four sets of words, acoustically similar, acoustically dissimilar, semantically similar or semantically dissimilar. Participants were asked to recall them immediately or following a twenty minute delay (MARSHALL, M. 2012). Acoustically similar words were more problematic to recall immediately while semantically similar words were more problematic in the long term. Therefore, due to the confusion between similar sounding words we can see that long term memory is more likely to rely on semantic coding. As the study was carried out in laboratory conditions the researchers were able to keep extraneous variables, such as noise distractions tightly controlled, thus displaying high internal validity.

There are two main types of memory theories psychologists look at to help understand how memory works. The first is called the mutli-store model (EYSENCK, M. W. and KEANE, M. T. 2010). This model consists of three types of memory stores: a sensory store, a short-term store and a long-term store. The sensory store continuously receives information from the senses. Most of this information receives no attention, therefore is only stored for a very brief period. Only when the persons attention is given to a sense, the information is then passed to the short term memory. Once there it can only be preserved for eighteen to twenty seconds if not rehearsed. Furthermore, with limited capacity of about seven chunks, it can be displaced if new information is received from the sensory store. Rehearsal of information causes it to be passed to the long term memory, where it can be retrieved at any point (MARSHALL, M. 2012). The simplicity of this model can be criticised

as it assumes there is only one store for long and short term memory, as well as its exclusion of emotional factors. Moreover, the research relating to the multi-store model has low ecological validity, as much of it was carried out on psychology students, therefore it can not be generalized to the entire population. As a result of this students may have predicted the nature of the experiment, leading to participant reactivity, thus lowering the internal validity.

The second type of memory store is the working model. This model described “ a more detailed multi-component model of the short term or working memory” (Eysenck, M. W. 2005 p. 54). This includes the Central Executive, which controls attention and plays a major role in planning and synchronising information, however it has limited storage capacity. Other components such as the Phonological loop store a number of speech-based sounds for brief periods. The Visuo-Spatial Scratch Pad which stores visual and spacial information and can be thought of as the ‘ inner eye’. The Episodic Buffer integrates and manipulates material in working memory (Cardwell, M et al 2008). Baddeley, AD., & Hitch, G. J. (1976) conducted a study in which participants where given digit strings to rehearse, while at the same time carrying out verbal reasoning tasks (Cardwell, M et al 2008). They concluded that short term memory is a flexible and complex system in which a main control system is aided by subsidiary systems. Although this system has strengths such as its ability to explain how we carry out tasks such as mental maths, its biggest weakness is that it completely ignores the emotional factors of memory. Moreover, it tells us very little about long term memory and how it relates to the working model.

Eyewitness testimony is the “evidence supplied by the people who witness a specific event or crime, relying on their memory” (Eysenck, M. W. 2005. p74). However, its reliability and accuracy can be distorted by leading questions. This was shown in an experiment conducted by Loftus, E. F., & Palmer, J. C. (1974). In this experiment participants were shown films of a car crash, then asked questions which included ‘how fast do you think cars were travelling when they crashed?’ and ‘did you see any broken glass?’. The words were altered, increasing in intensity such as, contacted, collided and smashed (Eysenck, M. W. and Keane, M. T. 2010). Results found that when asked the speed of the cars participants gave a higher speed when given a strong impact word. Also when asked one week later, a higher percentage of those who were given the stronger impact words reported to have seen broken glass. Therefore, this shows that leading questions effect peoples memory of an event and how memory is recalled, thus showing practical implications in the way interviews are conducted. The experiment allows for high levels of control, such as age and location, so as to only manipulate the IV. This experiment is not however indicative of real life, as the participant has no emotional involvement in the estimation of speed, and therefore the results are not ecologically valid. Moreover, there are other factors that could influence memory, such as environmental and alertness, extraneous variable’s such as these would lower the internal validity.

The conclusions drawn from this lead to the realisation that leading questions can effect eyewitness testimonies and so has lead to the development of the Cognitive Interview. The cognitive interview is a technique devolved from four instructions (Cardwell, M et al 2008). Research

into the effectiveness of the cognitive interview was done by Kohnken. G., et al (1999). This included a meta analysis of fifty three studies and found that the cognitive interview was 34% more accurate than a standard interview. As this research included many different studies the extraneous variables would not have been controlled, so the external validity would be lowered. The cognitive interview can raise ethical issues it can involve recalling stressful or traumatic events and as such it is important to ensure that interviewees are protected from harm, and any research is conducted within the British Psychological Society guidelines. As a result we can see how eyewitness testimony can be altered and distorted based on leading questions and how the cognitive interview can overcome this.

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