

A Case Study of an Amnesiac Patient, 'HM' (Milner et al, 1968).

The majority of research studies in cognitive psychology are **laboratory experiments**, in which a group of participants are given mental tasks to complete under different conditions, usually in a laboratory. The ways in which task performance changes in the different conditions tell us something about how mental processes work. For example, Glanzer and Cunitz (1966) found that giving people a mentally demanding task before they tried to recall a list of words made the recency effect disappear. They concluded that the recency effect must be contributed by STM. In a study like this, results from the *group* are analysed statistically, and conclusions are drawn from how the 'typical' or 'average' participant performed. In experimental studies, the researchers are not usually interested in *individual* performance.

The **case study** approach is different. In a case study, researchers document as fully as possible the characteristics of a unique person or situation because they may shed light on a particular psychological process. An important case study in the area of memory is that of a patient called 'HM', who was studied by Brenda Milner and her colleagues over a 50-year period (e.g. Milner et al, 1968). HM was an amnesia patient: he had impairments of memory.

At the age of seven, HM suffered a head injury. Shortly afterwards, he started to have epileptic seizures. These grew in frequency and severity over the next twenty years so that, by the age of 27, HM was unable to work and his seizures were potentially life threatening. It was agreed that he would have surgery on his brain in an attempt to alleviate his seizures. Dr William Scoville performed the surgery in 1953. He removed a number of structures, including the **hippocampus** from both sides of HM's brain. The surgery did alleviate HM's seizures. However, it left him with very severe memory problems.

In a series of investigations, Milner and her colleagues performed very extensive testing of HM's memory functioning. They found that he had good recall of his personal details, family history and childhood. His recall of the few years leading up to the operation, however, was very poor. Most obviously, though, HM had severe **anterograde amnesia**. Whilst he had a normally functioning short term memory he was apparently unable to store new long-term memories. Consequently, he spent the next 50 years of his waking life in a 30 second loop of time, forgetting things almost as soon as he had registered them. Although Milner worked with him for all that time, he never learned her name or recalled any of her investigations.

HM's impairments turned out to be more complicated than initially thought. In 1962, Milner taught him, over several sessions, to complete a task in which he traced a line with a pen whilst watching the pen and his hand in a mirror. He could never consciously recall learning to do this task and yet his performance got better with repeated practice. Milner and her colleagues concluded that HM's pattern of impairments suggested (1) that STM and LTM are distinct structures of memory; and (2) that LTM has two distinct systems, one handling memory for **facts and events** and the other handling memory for **motor skills**. The surgical damage to HM's brain had affected one but not the other.