

Evidence relating to theories of LTM

IMPORTANT - one of these studies does not belong!

Milner et al (1968) studied HM, who had his hippocampus removed during an operation to relieve epileptic seizures. HM had a normal digit span but apparently forgot the things that happened to him very rapidly. He was studied by the same researchers for many years but never learned their names and always greeted them as if meeting for the first time. Milner et al trained HM to complete a mirror-drawing task over a prolonged period. HM improved steadily at this skill. However, he was always surprised by his own ability to do it.

Ostergaard (1987) studied a patient CC, whose brain was damaged as a complication of diabetes when his brain was starved of oxygen for an extended period. Although CC's physical health improved, he had significant impairments of memory. A CT scan showed damage in the temporal and occipital lobes, including the hippocampus. Although he had no sensory or motor problems, and his IQ tested at 96-99 points (normal), CC had severe problems with his schoolwork, frequently losing track of what he was supposed to be doing and forgetting what he had learned. 4.5 years after his illness, Ostergaard compared CC's memory performance with a control group of children of normal ability. On a digit span test, CC's immediate mean digit span was 4.8 digits, which was the same as the control group's average. However, after a 20s delay, CC's digit recall was 1.1 compared with 3.1 for the controls. CC's delayed recall of stories and pictures was also severely impaired. Studies of CC word-knowledge and vocabulary showed that his progress since his brain injury had been quite limited. Ostergaard introduced CC to a new computer game involving motor skills. CC made progress in his game-play at an identical rate to the control group.

Tulving (2002) studied KC, whose brain was injured in a motorcycle accident. KC suffered extensive damage to the medial temporal lobes, including almost complete destruction of the hippocampus. KC was left with severe anterograde and retrograde amnesia. The retrograde amnesia was selective, so he could remember, for example, the difference between stalagmites and stalactites but not the death of his brother. Although KC forgot whatever he was thinking about immediately his attention turned to something else, Tulving was able, in a long series of laboratory training sessions, to train him to complete a set of three-word sentences. KC could recall 25 of 65 sentences months after training. It was also possible to teach him simple computer programming. Although he learned to do these things, KC had no recollection of learning them.

Shallice and Warrington (1974) studied KF, a man whose brain had been injured in a motorcycle accident. KF's LTM functioned normally, but his STM was severely impaired. Instead of around 7 items, KF was only able to recall 1 or 2 items from a list. Further investigation showed that KF forgot letters and digits much faster when he received them auditorily than visually. It was also found that KF had a normal STM span for meaningful sounds (e.g. a doorbell, a telephone ringing, a cart mewing) even though his STM span for words, letters and digits was very limited.

Vargha-Kadem et al (1997) present case studies of two children, Beth and Jon, both of whom suffered brain damage early in life. In neither case can they retain information about a day's events (e.g. what they did, who they spoke to, what they watched on TV). However, both attended mainstream schools and had normal levels of language, literacy and factual knowledge. A follow up study of Jon aged 20 found he had an above average IQ (114) and generally functioned very well, despite continuing to have very poor episodic memory.

1. Which study or studies support the view that declarative and procedural LTM are separate? Why?
2. Which, if any, challenge it?
3. Which study or studies support the view that episodic and semantic LTM are separate? Why?
4. Which, if any, challenge it?
5. Which study is not relevant to the question of whether LTM has separate subsystems? Why?
6. Why does research in this area rely so heavily on clinical case studies?
7. Why is this a problem?