

Memory

The Hippocampus

Responsible for episodic memory (recollection) (which is separate from familiarity, which is semantic). It is important for **imagining the future**.

John O'Keefe's research with rats in arenas has shown that place cells in hippocampus only activate in familiar environment.

Maguire, Frith et al. (1997) Taxi Driver Study
Studied london taxi drivers with PET. They were asked to think of the shortest route from A to B, recall famous landmarks and sequences from famous films. Activation in **right hippocampal areas** was higher during navigation task compared to others.

Encoding

Trial encoding can be improved by levels of processing and salience (e.g. novelty).

Levels of Processing (Craik & Tulving, 1977)

Asked participants to respond either to orthographic, phonological (e.g. rhymes with) or semantic (e.g. fits in sentence) characteristics of words (by pressing a button). Recall was highest for the latter, suggesting that levels of processing is important when encoding information, not just rehearsal.

This shattered the stores model, which argues that rehearsal allows for short-term information to be stored in the long term store (and thus, the hippocampus). Instead, it suggests that amount of amount of brain activation determines how well the memory is encoded.

Wagner et al. (1998)

Found that level of brain activity could predict how well a memory was stored.

There are 3 different types of memory (working memory, short-term and long-term memory).

There are also 3 different processes involved in memory: encoding, storage and retrieval.

There are two memory systems: declarative (explicit) and non-declarative (implicit) memory. This distinction was well documented by Tulving and Schacter.

Explicit memory can be revealed on tests that require conscious recollection of previous experiences or general knowledge.

Implicit memory can be revealed on tests where performance is facilitated in the absence of conscious recollection (e.g. priming people with words and then showing them fragments and measuring recall for primed and non primed words).

Patient HM

Received a **bilateral resection** from William Beecher Scoville, which removed anterior hippocampus, amygdala and perirhinal/entorhinal cortex.

Experienced temporally graded retrograded amnesia (extended back to age 16). Partial anterograde amnesia but was able to learn new procedural skills such as mirror writing. He was able to acquire new motor skills (Corkin, 1968, 2003) and could complete many priming tasks such as word stem completion and word-fragment completion and mirror writing.