MTT Explained

In the last decade a new theory has taken form, challenging the standard model of memory consolidation (SMC). Nadel and Moscovitch (1997) put forth the Multiple Trace Theory (MTT), which posits that the hippocampus is necessary for retrieval of remote memories. Proponents of MTT claim that SMC suffers from several serious problems, such as:

1. The length of the consolidation period (as demonstrated by the length of retrograde amnesia in subjects/patients) varies with the method of induced amnesia as well as the memory task that the subject is asked to complete. Methods of induced amnesia include lesion, electroconvulsive shock, or pharmacological intervention.

2. There is no empirically supported evidence for a mechanism of memory transfer from hippocampal to extrahippocampal areas.

3. Because SMC treats episodic and semantic memories so similarly, this model does not account for how episodic memories seem to become more semantic in nature over time.

MTT claims that memories are stored jointly in hippocampal and extrahippocampal circuits. This hypothesis leads to a different set of predictions than SMC. If remote memories are stored in hippocampal as well as extrahippocampal sites, then memory retrieval in MTL-lesion patients should differ than that of healthy patients. Along the same lines, memory retrieval (recent and remote) should activate the hippocampus. Finally, while episodic memories are stored mutually, semantic memories are stored only extrahippocampally.

In their 2006 paper, Steinworth et al. provide support for MTT.

Background Reading

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<th>Nadel and Moscovitch</th>
<th>1997</th>
<th>Memory consolidation, retrograde amnesia and the hippocampal complex</th>
<th>Current Opinion in Neurobiology</th>
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