

Abstract

A core feature of the human mind is the ability of abstraction. Relying on this ability, a mental or cognitive schema is a memory framework which underlies alike memory representations. In order for newly acquired memory representations to be preserved for long-term storage, they have to undergo memory consolidation and sleep is a major factor in this process. In a rat model, learning in the context of an existing schema is faster and it is characterised by IEG up-regulation. It is presumable that consolidation during sleep enables the extraction of commonalities from alike memory representations, resulting in schema formation. On a mechanistic level, schemata might be formed by a process which (a) employs synaptic potentiation induced by neuronal replay, (b) requires synaptic downscaling and (c) affects overlapping memory representations. This overlapping character of schema creation might be reflected by the nature of neuronal replay in the hippocampus. It appears that individual sleep stages influence schemata consolidation differently. In human experiments on schemata consolidation, the amount of knowledge a participant is given prior to training is critical.