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Poster Presentation

Neocortex and Memory

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Abstract

The human prefrontal cortex differs from all other mammals: the seat of complex cognition, abstract thinking, planning and future forecasting, and behavioral inhibition. Using our prefrontal cortex is a significant energy drain on the body, so despite its impressive capabilities, it's daily capacity is limited. Some researchers estimate a mere 2-3 hours per day of activity depletes the prefrontal cortex. The prefrontal cortex modulates our limbic instincts and lets us to respond mindfully to emotionally charged situations – to a degree. An extensive body of research has shown that disruption of the hippocampus primarily affects recently formed memories, but does not impair recollection of remote memories, believed to be stored in the neocortex. In the 70's, it has been proposed that the hippocampus serves as a simple moment-by-moment capturing system, while the neocortex stores information in a structured way. The neocortical representational areas are reciprocally connected to the hippocampus enabling linking of the neocortical representational areas by the hippocampus. The hippocampus is needed for rapid initial storage, while memories are slowly incorporated into the neocortex for stable long term storage. The slow restoration of memories in the neocortex is suggested to take place by repeated replay of the new information by the hippocampus.

Keywords: Neocortex, Memory, Hippocampus.

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