The role of model-free and model-based processes in learning and memory

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Human learning depends on multiple cognitive systems related to dissociable brain structures. These systems interact not only in cooperative but sometimes competitive ways in optimizing performance. Previous studies showed that manipulations reducing the engagement of fronto-hippocampal mediated model-based processes can lead to improved performance in fronto-striatum-related model-free learning. Here we present four studies in which we investigated the competitive relationship between these memory processes. Our result shed light not only on the competitive nature of brain systems in cognitive processes but also could have important implications for developing new methods to improve human learning.