

Influence of reward on visuomotor adaptation in complex tasks

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Abstract

Explicit strategies play an important role in visuomotor adaptation, but are subject to substantial capacity limits, calling into question their efficacy in complex settings. For instance, recent work has shown that when task complexity exceeds working memory capacity, observers are no longer able to fully adapt. Here, using a visuomotor rotation task in which participants were tasked with simultaneously adapting to eight target-rotation pairs, we examined the extent to which such capacity constraints may be ameliorated by reward-based feedback. We found that the mere presence of explicit reward did not change participants' behavior – a uniform reward distribution led to a similar pattern of behavior as has been previously reported. However, when a subset of target-rotation pairs was associated with a greater reward magnitude, participants demonstrated enhanced adaptation to them, which improved overall performance. These findings highlight the utility of reinforcement learning for enabling motor learning and adaptation in complex tasks.