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Experience-Dependent Representational Change During Motor Skill Learning

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Abstract

Efficient representation of our motor memories is essential for developing and deploying the plethora of human motor skills we use every day, yet there is little cohesion in understanding how these representations are organized and develop over time. In this study, we developed a novel behavioral paradigm aimed at probing experience-dependent representational change of a motor skill with training. Across several experiments, participants trained to coordinate novel finger configurations in a speeded reaction time task and performed a similarity judgment task to probe for changes in the psychological representation of the recently acquired skill. We sought to determine if learned representations of action can be found through behavioral methods and if such representations are organized based on similarity and independent reorganization patterns predicted by theories of sensorimotor neuroscience. Together, we propose a novel behavioral measure complementary to neuroimaging capable of observing human representational change of a motor skill over time.