Article Contents

Contextual Priors Guide Perception and Motor Responses to Observed Actions

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Abstract

In everyday-life scenarios, prior expectations provided by the context in which actions are embedded support action prediction. However, it is still unclear how newly learned action–context associations can drive our perception and motor responses. To fill this gap, we measured behavioral (Experiment 1) and motor responses (Experiment 2) during two tasks requiring the prediction of occluded actions or geometrical shapes. Each task consisted of an implicit probabilistic learning and a test phase. During learning, we exposed participants to videos showing specific associations between a contextual cue and a particular action or shape. During the test phase, videos were earlier occluded to reduce the amount of sensorial information and induce participants to use the implicitly learned action/shape–context associations for disambiguation. Results showed that reliable contextual cues made participants more accurate in identifying the unfolding action or shape. Importantly, motor responses were modulated by contextual probability during action, but not shape prediction. Particularly, in conditions of perceptual uncertainty the motor system coded for the most probable action based on contextual informativeness, regardless of action kinematics. These findings suggest that contextual priors can shape motor responses to action observation beyond mere kinematics mapping.

Keywords: action prediction, context, motor resonance, priors, top-down modulations