

Action learning: hierarchical organization and perspective

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Abstract Many everyday actions are learned by observing others perform them. Here, we investigate an account of how the mental representations elicited by observation are transformed into action plans and how that translation can be augmented. Neuropsychological evidence suggests that the motor system is naturally aroused by observing action, implicitly mapping the actor's body onto one's own. Those natural processes can be augmented by manipulations that encourage coding the observed action into a goal/subgoal hierarchy and by taking the spatial perspective of the actor rather than one's own. In a series of studies supporting this analysis, participants twice watched a video of an agent assembling an object. While watching, they pressed a button indicating when one action unit ended and

another began, once for the coarsest units that made sense and once for the finest units that made sense (in counterbalanced order). In some cases, participants described or imitated what happened in each unit as they viewed; the perspective and focus of the descriptions or imitations were systematically varied. The temporal organization of the coarse and fine units provided a measure of hierarchical encoding of the action. After the segmentation task, participants were surprised by a request to perform the actions. Both hierarchical encoding and action learning were facilitated by describing or imitating the action from the actor's perspective rather than one's own, especially when the focus was on the actor's hand.

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