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IQ and working memory predict plan-based sequential action learning

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Abstract

How people learn and produce sequential actions (e.g., making coffee) has been the subject of empirical and theoretical scrutiny, for it covers most human activities. One useful distinction is between stimulus-based control, in which action selection is driven largely by the environment, and plan-based control, which assumes learning of structured sequences of actions and effects. Task demands, instructions, and participants' individual abilities and inclinations can all modulate the control mode used. We investigate two sequence learning tasks, with one key difference: in the cued task either control mode is possible, while learning in the reinforcement task requires plan-based control. Using measures of visuospatial working memory (VWM) capacity, locus of control, need for structure, and IQ, we seek to explain individual differences in choice of control mode and task performance, establishing a link between VWM capacity and performance, as well as explicit knowledge evidencing plan-based control.