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Do Actions During Math Learning Leave a Legacy in Gesture?

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Abstract

The embodied cognition framework holds that cognition is grounded in action (Glenberg, 2010). This perspective implies that actions can influence learning. Actions may also influence the gestures made when later recalling the concept learned. According to the Gesture-as-Simulated-Action hypothesis, gestures derive from action simulations that underlie thinking and speaking (Hostetter & Alibali, 2008). When concepts are learned through action, those same actions may be activated when recalling that concept. Thus, learners actions may leave a legacy in their gestures. Moreover, gestures are a form of action, and as such, gestures may directly influence learning.

This study investigated childrens (N=94) learning about mathematical equivalence both without actions (control), and using mathematical manipulatives that afforded differing actions (stacking blocks, a pan balance, and buckets and bean-bagsin which children simulated a balance scale with their bodies). Working with the manipulatives did not enhance learning relative to control, but gestures differed.