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The influence of object size on second-order planning in an overturned cup task

Sara Scharoun Benson

University of Windsor, Sara.Scharoun@uwindsor.ca

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The impact of object size on the development of motor planning skills

For children, second-order planning in object manipulation, as demonstrated by the end-state comfort (ESC) effect, is constrained by numerous factors. As a step towards delineating the influence of object size, children (ages 6–10, $n = 113$) and adults (ages 18–25, $n = 17$) performed an overturned cup task with 8 cup sizes (4.7–8.4 cm diameter). Contrary to the hypothesis, cup size did not predict the overall proportion of trials with ESC. An increase in age and hand length did result in more ESC. Subsequent analyses with children, which focused on each cup size, revealed an increase in the ratio of hand size to cup size resulted in an increase in ESC with the 4.7, 5.2, 6.2, and 6.7 cm cups, age was a significant predictor with 4.7, 5.2, and 6.2 cm cups, and the interaction was significant for the 6.2 cm cup. No other significant results emerged. Together, findings offer preliminary support for the notion that object size does constrain children's motor planning skills to a certain degree (i.e., with large cups); however, further inquiry is warranted to elucidate the link between object size and hand size in children's performance of tasks requiring second-order planning.