

Publication

A Matter of Balance: Motor Control is Related to Children's Spatial and Proportional Reasoning Skills

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Recent research has shown close links between spatial and mathematical thinking and between spatial abilities and motor skills. However, longitudinal research examining the relations between motor, spatial, and mathematical skills is rare, and the nature of these relations remains unclear. The present study thus investigated the relation between children's motor control and their spatial and proportional reasoning. We measured 6-year-olds' spatial scaling (i.e., the ability to reason about different-sized spaces), their mental transformation skills, and their ability to balance on one leg as an index for motor control. One year later ($N = 126$), we tested the same children's understanding of proportions. We also assessed several control variables (verbal IQ and socio-economic status) as well as inhibitory control, visuo-spatial and verbal working memory. Stepwise hierarchical regressions showed that, after accounting for effects of control variables, children's balance skills significantly increased the explained variance in their spatial performance and proportional reasoning. Our results suggest specific relations between balance skills and spatial as well as proportional reasoning skills that cannot be explained by general differences in executive functioning or intelligence.

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