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Authors

Gilligan, Katie

Hodgkiss, Alex

Thomas, Michael

et al.

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The role of spatial skills in mathematics cognition: Evidence from children aged 5-10 years

Katie Gilligan

UCL Institute of Education, London, United Kingdom

Alex Hodgkiss

UCL Institute of Education, London, United Kingdom

Michael Thomas

Birkbeck College, University of London

Emily Farran

UCL Institute of Education, London, United Kingdom

Abstract: While there is evidence of associations between spatial skills and mathematics, relatively few studies explore these associations in children aged 5-10 years. I will present findings from longitudinal and cross-sectional studies to highlight the importance of spatial skills as both longitudinal and concurrent predictors of mathematics. First, secondary data analysis of the Millennium Cohort Study indicates that spatial performance at both 5 and 7 years is a significant predictor of mathematics at age 7 ($N = 12099$). Second, cross-sectional findings from children aged 5-10 years ($N=156$), suggest that spatial skills explain 10-12% of the variation in standardised maths performance and approximate number sense, even after accounting for vocabulary skills. That is, spatial scaling was a significant predictor of mathematics for all age groups, while the role of mental rotation and mental folding varied with age. These findings have implications for the design of mathematics interventions customised for specific developmental stages.