Kindergarten Predictors of Mathematics: Quantitative, Working Memory and Linguistic Skills

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Abstract

Which cognitive skills predict childrens math ability? Three types of cognitive predictors were identified in the Pathways to Mathematics model (LeFevre et al., 2010; Sowinski et al., 2015): quantitative, working memory, and linguistic skills. In the current research, we evaluated the Pathways to Mathematics model concurrently, in Kindergarten (N = 159 children; 87 girls; mean age = 5 years, 10 months), as the first testing point in a larger longitudinal study. Quantitative skills were assessed using subitizing and both non-symbolic and symbolic number comparison. Working memory skills were assessed using phonological and visuo-spatial span tasks. Linguistic skills were assessed using receptive vocabulary and phonological awareness tasks. Consistent with the model, all three factors (quantitative, working memory, and linguistic skills) accounted for significant unique variance in mathematics performance (betas of .21, .28 & .31, respectively, controlling for age in months). Jointly the factors accounted for 41% of variance in mathematics performance.