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Arithmetic Sense Predicts Children's Mathematical Achievement Better Than Arithmetic Fluency

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Abstract

Research on arithmetic competence has emphasized the importance of *arithmetic fluency* – the use of efficient direct strategies when solving simple, conventional problems. Comparatively little attention has been focused on *arithmetic sense*, which we define as the adaptive use of direct and indirect strategies when solving complex, novel problems. The current study evaluates the new construct of arithmetic sense and investigates its predictive relationship to mathematical achievement. 302 students in 6th grade completed a battery of tests of their cognitive and numerical abilities, arithmetic fluency, arithmetic sense, mathematics achievement, and pre-algebra skills. The central finding is that arithmetic sense is the best single predictor of mathematical achievement. In particular, it is better than arithmetic fluency. These findings open a new pathway for improving school-aged students' algebraic thinking and mathematical achievement.

Keywords: arithmetic fluency; arithmetic sense; mathematics achievement; pre-algebra