Abstract

This study investigated the predictive relations between working memory in Kindergarten and mathematics achievement in first and second grade. The research is underpinned by Baddeley’s model of working memory (Baddeley & Hitch, 1974; Baddeley, 1986, 1996, 2000) and places particular emphasis on the roles of the central executive and the phonological loop components of the working memory system. A sample consisted of 92 participants (age range: 4 years, 4 months to 6 years, 5 months). Measures of vocabulary, working memory, and phonological processing were administered to children in Kindergarten and their early numeracy, mathematics word-problem solving, and knowledge of mathematical concepts were assessed in first and second grade. Results from hierarchical regression analyses showed the central executive of Baddeley’s model is important to explanations of children’s early numeracy and their emerging knowledge of mathematics concepts, whereas processing affiliated with the phonological loop explains first grade early numeracy and second grade mathematics word-problem solving. Implications of the study findings for early screening for children at-risk for mathematics learning disabilities are discussed.

Keywords: working memory; mathematics achievement; elementary school