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Kindergartners' base-10 knowledge predicts arithmetic accuracy concurrently and longitudinally.

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Summary: Children's early knowledge of the base-10 structure of multi-digit numbers has been hypothesized to play a critical role in subsequent learning of mathematics, in particular arithmetic operations. The present study investigated the relation between base-10/place value understanding and arithmetic accuracy in early elementary school. Children were assessed in kindergarten ($N = 90$) and then a subgroup of participants was assessed again two years later in second grade ($N = 21$). Mediation analyses indicated that, in kindergarten, base-10 knowledge had a direct effect on arithmetic accuracy as well as an indirect effect through the use of a decomposition strategy. Furthermore, kindergarten base-10 knowledge had a direct effect on arithmetic accuracy in second grade and an indirect effect through second grade place-value notation understanding. Implications for understanding early mathematical development are discussed.

Classification: F21 F31 C31

Keywords: base-10 knowledge; arithmetic; place-value concept; strategy; early childhood

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