Early numerical abilities and cognitive skills in kindergarten children.

Summary: In this study, a unitary path analysis model was developed to investigate the relationship between cognitive variables (derived from published studies) and early numerical abilities in children attending the last year of kindergarten. We tested 100 children starting their last year of kindergarten on the following cognitive abilities: intelligence, phonological abilities, counting, verbal and visuospatial short-term memory and working memory, processing speed, and early numerical abilities. The same children were tested again on early numerical abilities at the end of the same year. The children's early numerical abilities at the beginning of the final year of kindergarten were found to be directly related to their verbal intelligence, phonological abilities, processing speed, and working memory and to be indirectly related to their nonverbal intelligence. Early numerical abilities at the end of the same year are directly related not only to early numerical abilities assessed at the beginning of the year but also to working memory and phonological abilities as well as have an indirect relationship with verbal and nonverbal intelligence. Overall, our results showed that both general and specific abilities are related to early mathematic learning in kindergarten-age children.

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