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Cognitive Level of Development and Mathematical Fluency of First Grade Children.

This study was designed to investigate the cognitive level of development and mathematical fluency of first grade children. A total of (N=100) 6 and 7-year-olds from two low-socio-economic elementary schools participated in this study. Jean Piaget's conservation-of-liquid experiment was administered to children to determine their cognitive level of development. A balanced between-subjects research design included a randomized sample of (n=50) nonconserving and (n=50) conserving children. Using a counterbalanced method, two single-skill Math Fact Probe instruments were administered separately for two-minutes to measure addition fluency and subtraction fluency. The results from a MANOVA indicated that conserving children had significantly greater addition fluency and subtraction fluency than nonconserving children. Post-hoc analysis revealed that age had a separate, but additional effect on mathematical fluency above and beyond cognitive level of development. The implications of this study indicated that cognitive level of development was not a grade level designation. The invariant levels of cognitive development were characterized by different abilities in mathematical fluency. (Received October 06, 2010)