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Time knowledge acquisition in children aged 6 to 11 years and its relationship with numerical skills.

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Summary: Acquisition of time knowledge (TK; the correct representation and use of time units) is linked to the development of numerical abilities, but this relationship has not been investigated in children. The current study examined the acquisition of TK and its association with numerical skills. A total of 105 children aged 6 to 11 years were interviewed with our Time Knowledge Questionnaire (TKQ), developed for purposes of this study, and the Zareki-R, a battery for the evaluation of number processing and mental calculation. The TKQ assessed conventional time knowledge (temporal orientation, temporal sequences, relationships between time units, and telling the time on a clock), estimation of longer durations related to birthday and life span, and estimation of the duration of the interview. Time knowledge increased with age, especially from 6 to 8 years, and was strongly linked to numerical skills. Regression analyses showed that four numerical components were implicated in TK: academic knowledge of numbers and number facts (e.g., reading Arabic numerals, mental calculation), number line estimation (e.g., correspondence between a number and a distance), contextual estimation (e.g., many/few leaves on a tree, children in a family), and numerical tasks involving verbal working memory (e.g., comparison of numbers presented orally). Numerical correlations with TK varied according to children's age; subtests based on academic knowledge of numbers, working memory, and number line estimation were linked with TK in the younger children, but only contextual estimation was associated with TK in the older children.

Classification: F72 F73 C32 C33 C42 C43

Keywords: time knowledge; numerical skills; academic skills; magnitude; contextual estimation; childhood
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