How Much Do I Subitize? Let Me Count Instead

Subitizing Ability across Children with Low, Medium and High Math Skill

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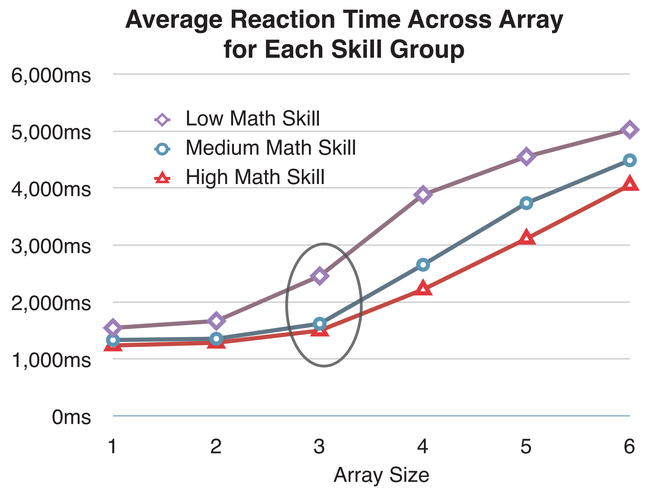
Is Subitizing a Foundation Skill?

Subitizing is the ability to enumerate a small array of objects without overtly counting each item. Subitizing has been identified as a relatively flat slope across reaction times when enumerating 1-3 items relative to a constantly increasing slope for arrays of 4 or more. Recently, Landerl et al. (2004) noted that children with math disabilities do not appear to subitize even small arrays of 1-3 items and proposed that the ability to subitize may be a foundation skill for formal math knowledge. Benoit's research on the development of number word skills appears to support this theory.

To explore if subitizing is required to develop general math knowledge, 256 Canadian school children (SK to grade 2) were divided into general math skill groups (low, medium and high skill) and subitizing ability (Subitizers and Counters).

As seen below, we found that children who were classified as low math skill did not appear to subitize arrays of 2-3 objects (Smith-Chant et al. 2005).



Defining a 'Subitizer'

We define the Subitizer group as children with a relatively flat RT slope over arrays of 1 to 3 objects. Counters do show a slope over those arrays – they appear to be counting.

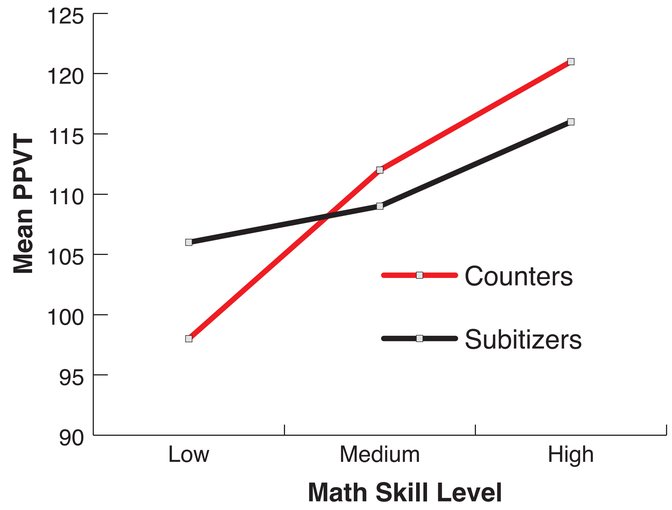
Subitizer	slope < 200 ms
Counter	slope > 200 ms

Math Skill	Low	Medium	High	All
Subitizers				
n	118	111	54	183
Standardized Regression Coef cient	.39	.39	.37	.38
Counters				
n	18	39	**16**	73
Standardized Regression Coef cient	.61	.65	**.69**	.65

Some Counters are high skilled in math!

High-Skill Counters have Verbal Skills

We compared a number of measures between the skill groups – including Corsi, Digit Recognition, Counting, and Addition performance. The only measure with significant differences was verbal ability, as measured by the Peabody Picture Vocabulary Test™(PPVT). The high math skill Counters have significantly different PPVT scores from both the Counter and Subitizer low and medium skill groups (>.05). They have a near significant difference from the Subitizer high skill group.



We conclude that although subitizing may be a core skill for developing math ability generally, some children may be able to compensate for a deficit in subitizing with other skills, such as exceptional verbal abilities. This observation also suggests that there are individual differences in the core cognitive abilities involved in basic arithmetic.

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