

Number Word Learning in Preschool Children

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KEY IMPLICATIONS

- Children begin to learn the meaning of counting around age 2, and most acquire it by age 4 although a small proportion still struggle.
- Visual comparisons and number contrasts can help children learn number word meanings.
- Number books can provide a rich source of number input in the preschool classroom.

BACKGROUND

Number words are the building blocks of mathematical development, and mastery of their meanings predicts later mathematical

achievement. However, very little is known about when children in Singapore – often exposed to languages other than English – begin to learn the meaning of number words, and what may predict their learning.

FOCUS OF STUDY

Following a baseline description of children's number word learning in English, the following questions are addressed:

1. Does learning more than one language affect children's number word learning?
2. To what extent do teachers engage in math talk in the preschool classroom?

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This brief was based on OER 05/18PC: Improving Early Number Word Learning: Examining the Role of Input.

Finally, training studies explored whether young children can learn from enriched number input through comparisons, and ask what individual differences may predict such learning.

KEY FINDINGS

- Children begin to learn the meaning of counting at around age 2 and most have acquired it by age 4, but approximately 17% of 4-year-olds have not yet acquired it.
- Children's knowledge of small number words does not transfer across languages, but their understanding of the counting principles does.
- Teachers engage in a lot of math talk when reading number books, and there was more math talk when reading non-fiction number books than fiction number books.
- Different number books serve different functions: teachers integrated emotions with numbers when reading a fiction number book and they engaged in focused conversations about numbers when reading a non-fiction number book.
- Approximately half of the children who have not yet acquired the meaning of counting were able to acquire the meaning of a larger number word after exposure to enriched number input through comparisons and contrasts.

SIGNIFICANCE OF FINDINGS

Implications for practice

- Preschool teachers can use different number books to provide number input. Non-fiction number books allow for focused conversations on numeracy, and fiction number books provide opportunity for teachers to integrate numeracy with other domains (e.g., socio-emotional learning).

- Preschool teachers can play a simple Give-Me-Six game to quickly assess whether children have acquired the meaning of counting.
- Providing different comparisons can enrich number input provided to children.
- Learning the count sequence in Mother Tongue can help children learn number word meanings in that language.

Implications for policy and research

- Further support and training can be provided in using number books and comparisons for preschool teachers.
- Further research can explore how to support teachers to engage in enriched number talk in shared book reading.

PARTICIPANTS

The sample included 145 2- to 5-year-old children recruited from childcare centres across Singapore, with a mean age of 47.1 months (SD = 8.5 months, Range = 28.4 months to 67.4 months). In addition, we recruited 31 teachers from nursery and kindergarten classrooms. The average years of teaching experience were 6.3 years (ranging from 8 months to 18 years, and the median was 5 years).

RESEARCH DESIGN

We assessed children's number word knowledge in a baseline study by playing a simple Give-N Game and asked children to give a puppet a certain number of toys. We played this game in both English and Mother Tongue. We also gave teacher questionnaires, and asked them to read non-fiction and fiction number books to code their math talk along several categories (e.g., counting, comparison, simple arithmetic).

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