Parent-Child Number, Spatial, and Pattern Experiences at Home Relate to Parents’ Math Beliefs

Ashli-Ann Douglas and Erica L. Zippert

Vanderbilt University

**Background**

- Much of the research on early mathematics development focuses on numeracy.
- However, emerging evidence shows that early patterning and spatial skills are also important predictors of later mathematics achievement.
- Children’s early math skills vary significantly even before school entry, and this puts some at risk for math failure later on.
- Parents can support their children’s numeracy and spatial skills by engaging them in number and spatial activities at home.
- Parents report engaging their children in various pattern, spatial and number activities at least once per week.
- Parents’ math-related attitudes, and beliefs are associated with their efforts to engage their children in number and spatial activities at home.

**Questions**

- How frequently do parents engage their pre-kindergarten children in pattern versus number and spatial activities at home?
- How do parents’ math beliefs and values relate to the frequency with which they engage their children in a range of math activities at home?

**Participants**

- 62 parents of 4- and 5-year-old children were recruited from 6 public and private preschools in a southeastern city.
- Most parents were mothers (84%) and around half reported being racial or ethnic minorities (54%).
- About half of the preschoolers were female (52%) and were reported as racial or ethnic minorities (55%).
- Most of the parents reported having associate’s, undergraduate, or graduate degrees (73% of mothers and 56% of fathers).

**Method**

- **Procedure**
  - 2 surveys were sent home to parents via mail or email.

- **Home Math Activity Survey**
  - Parents reported how frequently they engaged their children in math activities at home using 25 items on a 6-point scale.

- **Parent Belief Survey**
  - Includes parents’ estimated current ability, and ability while in school, includes parents’ estimates of children’s current, recent, and future abilities.

**Results**

- **Parents’ Beliefs About Themselves**
  - Number (M(SD) = 3.1(0.9))
  - Spatial (M(SD) = 3.0(1.0))

- **Parents’ Beliefs About Their Children**
  - Number (M(SD) = 2.7(0.7))
  - Spatial (M(SD) = 2.6(0.9))

**Correlations Between Home Math Activity Engagement & Parents’ Beliefs**

- **Parents’ Beliefs About Themselves**
  - Number (M(SD) = 5.3(1.3))
  - Spatial (M(SD) = 5.2(1.3))

**Discussion**

- These findings suggest that parents reportedly engage their preschool children in pattern and spatial activities for a comparable amount of time, but less frequently than number-related activities.
- The frequency of spatial, pattern, and number activity engagement is positively related to parental beliefs about children’s spatial, pattern, and number skills. This may suggest that early number, pattern, and spatial experiences have within-skill and crossover effects on development in these areas.
- Alternatively, parents may engage their children more in activities where they believe their children are best able to excel.
- Parents seem to be concerned about their children’s level of interest in, but not the usefulness of number, pattern, and spatial activities in guiding their children’s development in these areas.
- Finally, parents less anxious about number and spatial activities tend to be somewhat more likely to engage their children in these types of activities at home.

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