

---

September 2018

Dear parents,

We are writing to thank you for participating in our study during the **2016-2018 academic years**. We finished our data collection in May and wanted to share some of our initial findings with you. The purpose of this study was to help us understand how patterning skills contribute to math learning in pre-K and Kindergarten.

For Pre-K children with parental permission (during Fall of 2016 and Spring of 2017), we played games that measured their patterning, spatial and broad math skills. As with previous studies, we found that children were pretty good at tasks involving copying and extending patterns. As expected, children had a harder time completing tasks such as replicating a pattern using different materials and identifying the core unit that repeats within a pattern. As expected, spatial tasks measuring their skills in visualizing how objects would look when turned in different ways, matching identical pictures, and remembering locations were challenging for pre-K children. Our broad math measure assessed children's counting, number comparison, number symbol knowledge, simple calculations with objects and shape recognition. As expected, children were skilled with basic math tasks.

Near the end of children's kindergarten year (Spring of 2018), we played games that measured their patterning skills, knowledge of several number concepts and broad math knowledge. We found that children were pretty good at patterning tasks. Children also improved upon their pre-K performance on our broad math measure, and most of the children were able to count to 100.

Overall, we found that children's patterning and spatial skills were highly related to each other and to their broad math knowledge in pre-K. Children's patterning skills in particular were highly related to their pre-K mathematics knowledge. In addition, we found that children's patterning skills at the end of pre-K were highly related to their ability to count to 100 and to their broad math knowledge at the end of kindergarten.

These findings suggest that children's patterning skills may help them notice and learn numeracy skills, in part because some numeracy skills involve patterns. For example, there is a pattern in the number names from 20 to 99, and noticing this makes learning to count easier. This study suggests that patterning is an important aspect of early math. Helping children do increasingly challenging patterning tasks may be a way to provide a good foundation for math achievement. This is exciting because children, parents and teachers often enjoy working with patterns.

Again, we appreciate your participation in our study. Please feel free to contact us with any further questions.

Sincerely,

Bethany Rittle-Johnson, PhD  
Vanderbilt University  
[bethany.rittle-johnson@Vanderbilt.edu](mailto:bethany.rittle-johnson@Vanderbilt.edu)