

The Effect of Gender on Children's Pattern-Making Skills

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Purpose

Our goal was to characterize children's performance on early patterning tasks as a function of gender.

Background

Children's early pattern skills, such as replicating, extending, and describing patterns, have been shown to correlate with later formal math and reading achievement (Kidd et al., 2014). Given previous mixed findings on gender differences in math (Hyde et al., 1990), we focused on gender differences using a specific patterning task.

Pattern Abstraction

Pattern abstraction tasks require children to recreate the structure of a pattern using novel materials (e.g. given 'square-circle-circle', one could recreate the same structure using different shapes such as 'star-triangle-triangle').

Method

Participants: 10 male children (*M* age = 5.5 yrs.), and 10 female children (*M* age = 5.6 yrs.)

Task: Participants were first asked to solve and explain 1 baseline item with no instruction. Participants were then shown pairs of worked examples and similar solve items. They solved a total of 8 pattern abstraction items: 1 baseline item, 3 simple pattern items, and 4 complex pattern items.

Pattern Types

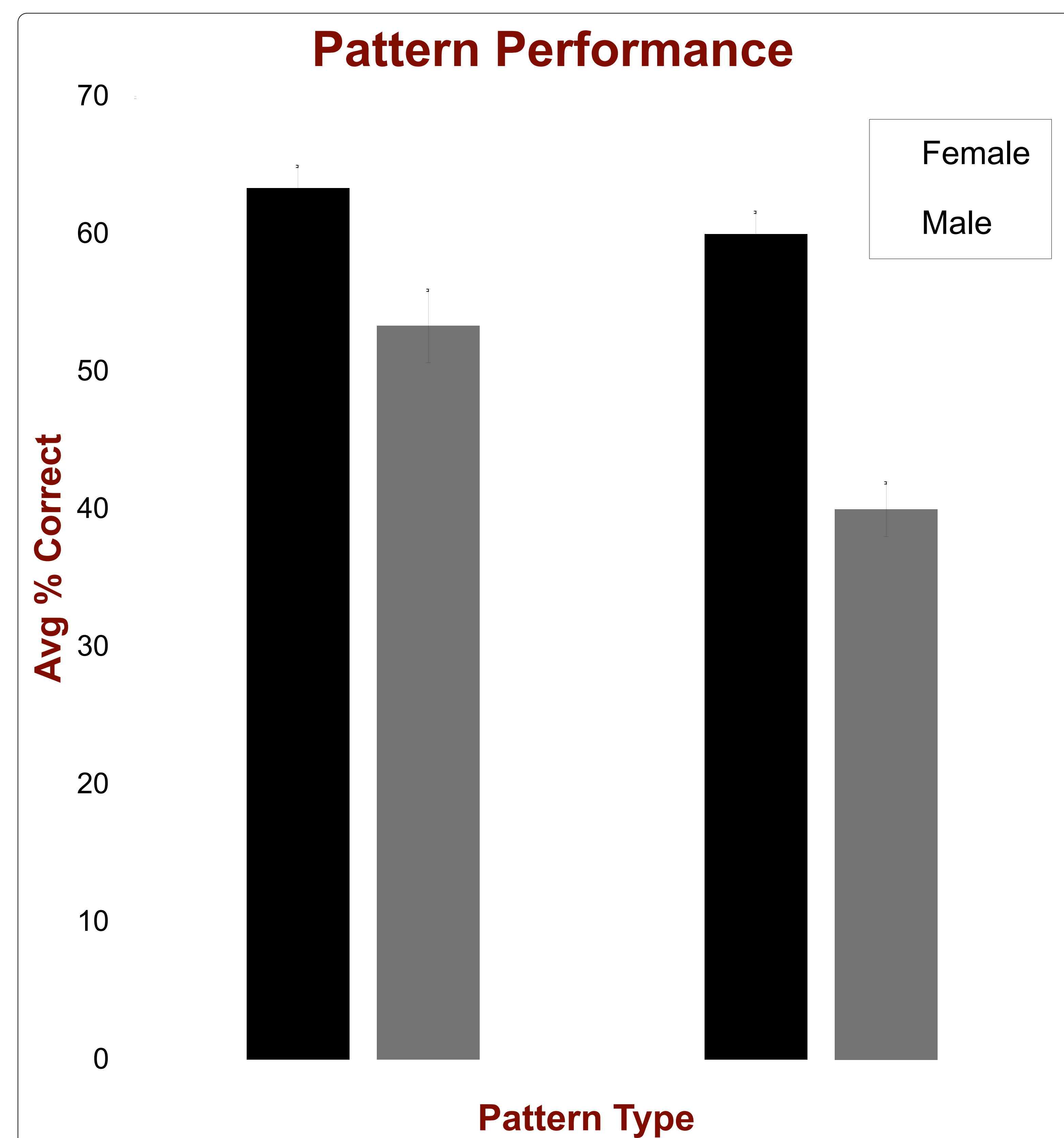
- ❖ **Simple Patterns (n = 3)** contain two different objects (e.g. comprised of small circles and big squares). Pattern structures were ABB, AAB, and AABB.
- ❖ **Complex Patterns (n = 4)** contain three different objects (e.g. small circle, big circle, small square). Pattern structure was ABC for all 4.

Conclusions

Results indicate that female children performed better than their male counterparts on early pattern abstraction tasks. However, results suggest that males may benefit as much, or more from instructional support and problem-solving.

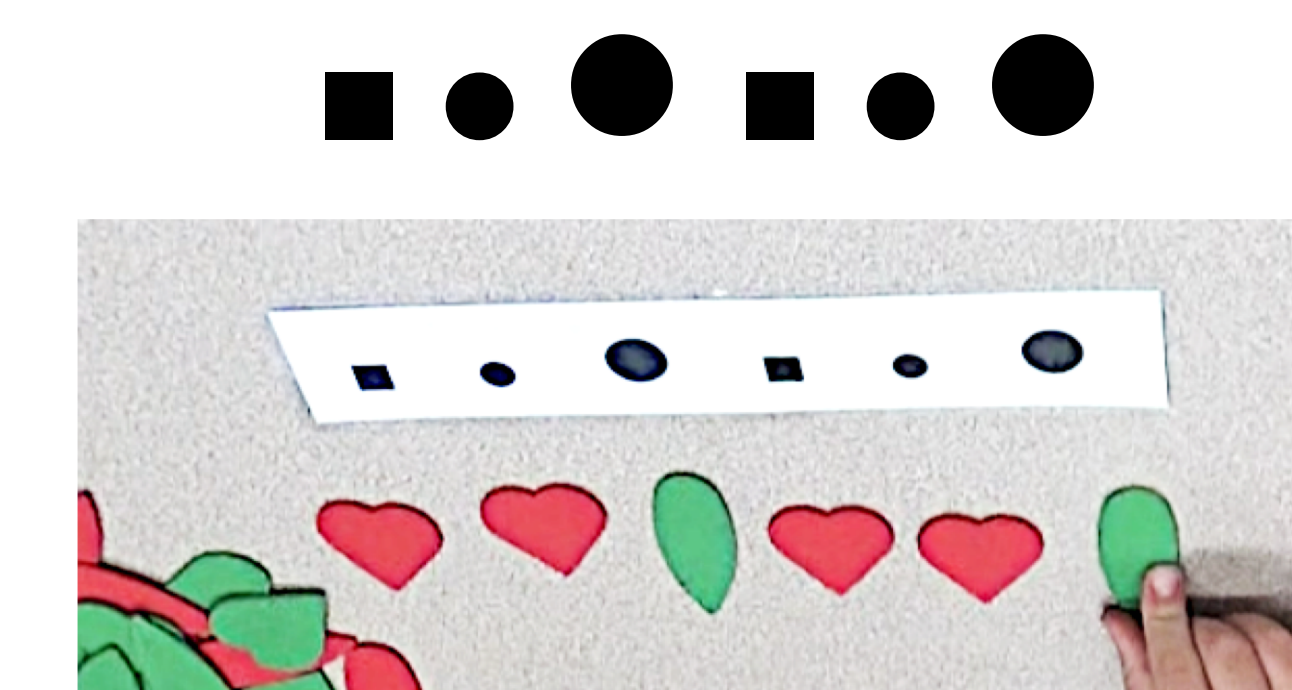
Results

- Baseline Performance: more females (50%) than males (20%) solved this item correctly.

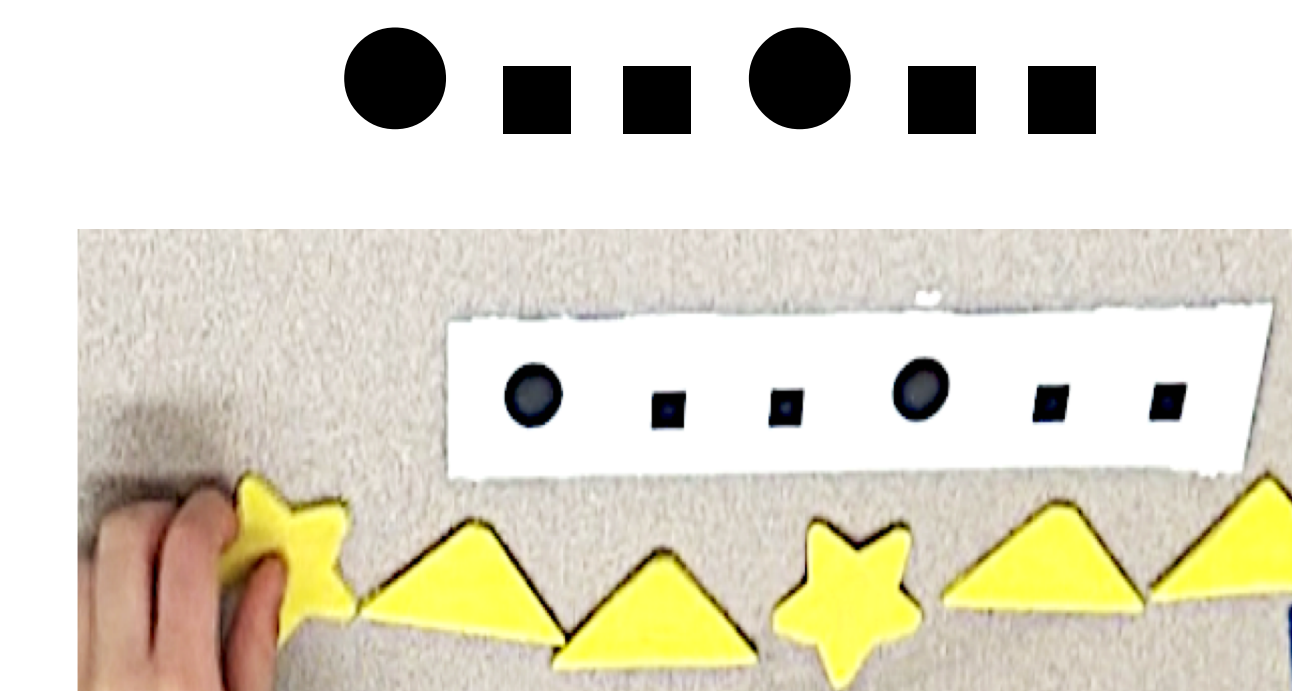


Sample Responses

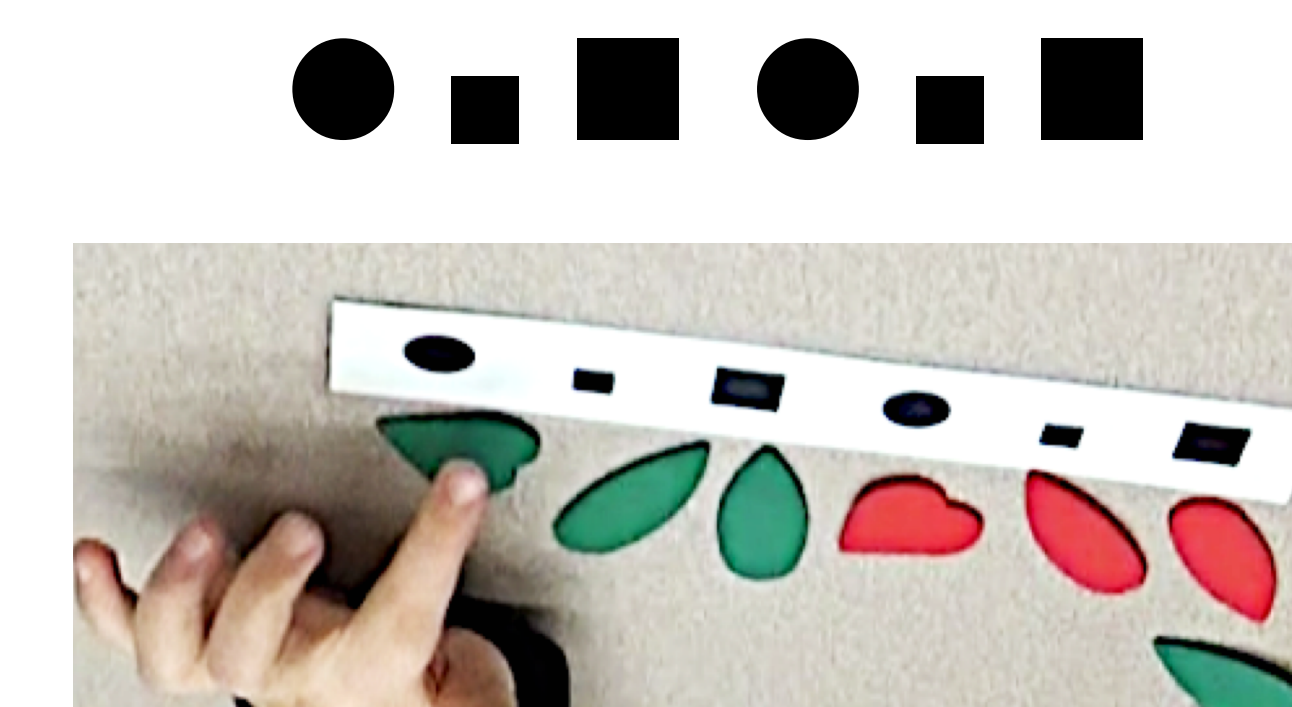
Baseline Item



Simple Pattern



Complex Pattern



Implications

There may be gender differences in children's early math skills and their ability to learn these skills. Future research should further examine these differences using a variety of tasks and investigate why these differences exist and the influence they have on later mathematical achievement.

References

- Hyde, J., Fennema, E., & Lamon, S. (1990). Gender differences in mathematics performance: A meta-analysis. *Psychological Bulletin*, 107, 139-155.
- Kidd, J. K., Pasnak, R., Gadzichowski, K. M., Gallington, D. A., McKnight, P., Boyer, C. E., & Carlson, A. (2014). Instructing First-Grade Children on Patterning Improves Reading and Mathematics. *Early Education & Development*, 25, 134-151.