

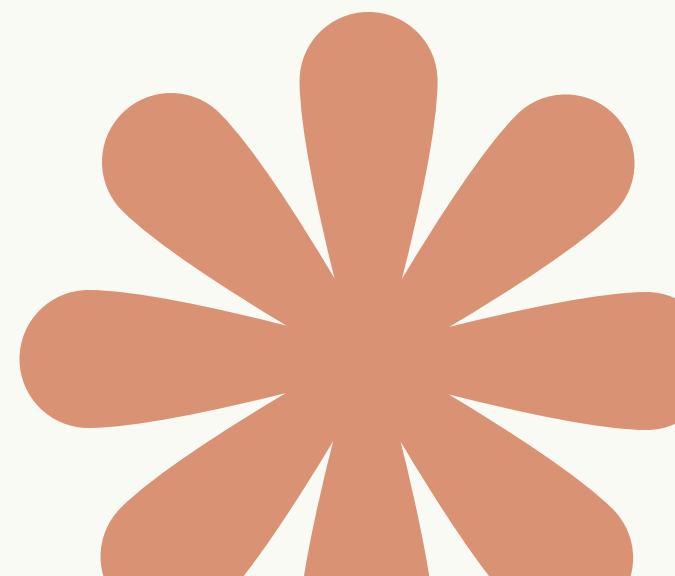
*add*Ed Research*

**What works best -
virtual or concrete
manipulatives?**

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Summary

This research compared concrete base-ten block manipulatives to virtual base-ten block manipulatives with an app on an iPad in support of mathematics skills of three elementary students with autism. Researchers compared use of two manipulative types in both double-digit addition and word problem-solving activities.



Methods

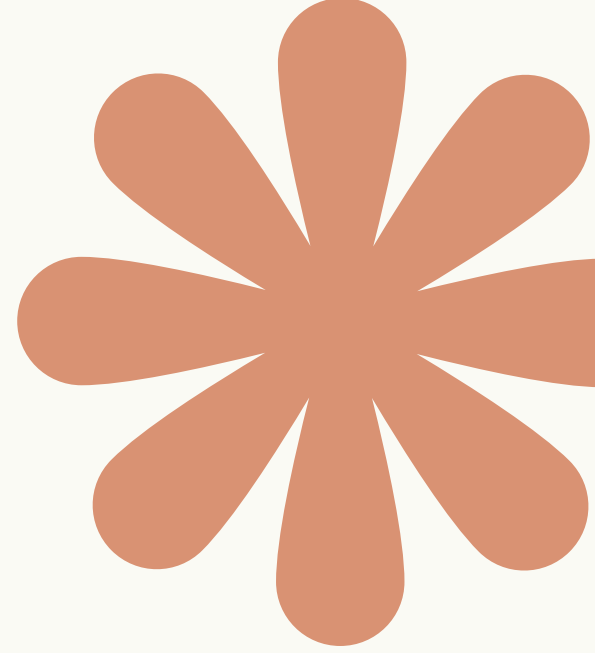


- **Participants= 3 elementary school boys with autism in need of math supports.**
- **After completing baseline (pre-intervention tasks), students were taught how to use both concrete manipulatives (CM) and virtual manipulatives (VM).**
- **Once students could use both manipulatives, they solved mathematical problems using one of the two tools, ordered at random.**
- **Correct and unprompted steps to solve the problem and correct solution were noted for each.**
- **The outcome (dependent) variable was the percentage of problems successfully solved without assistance.**

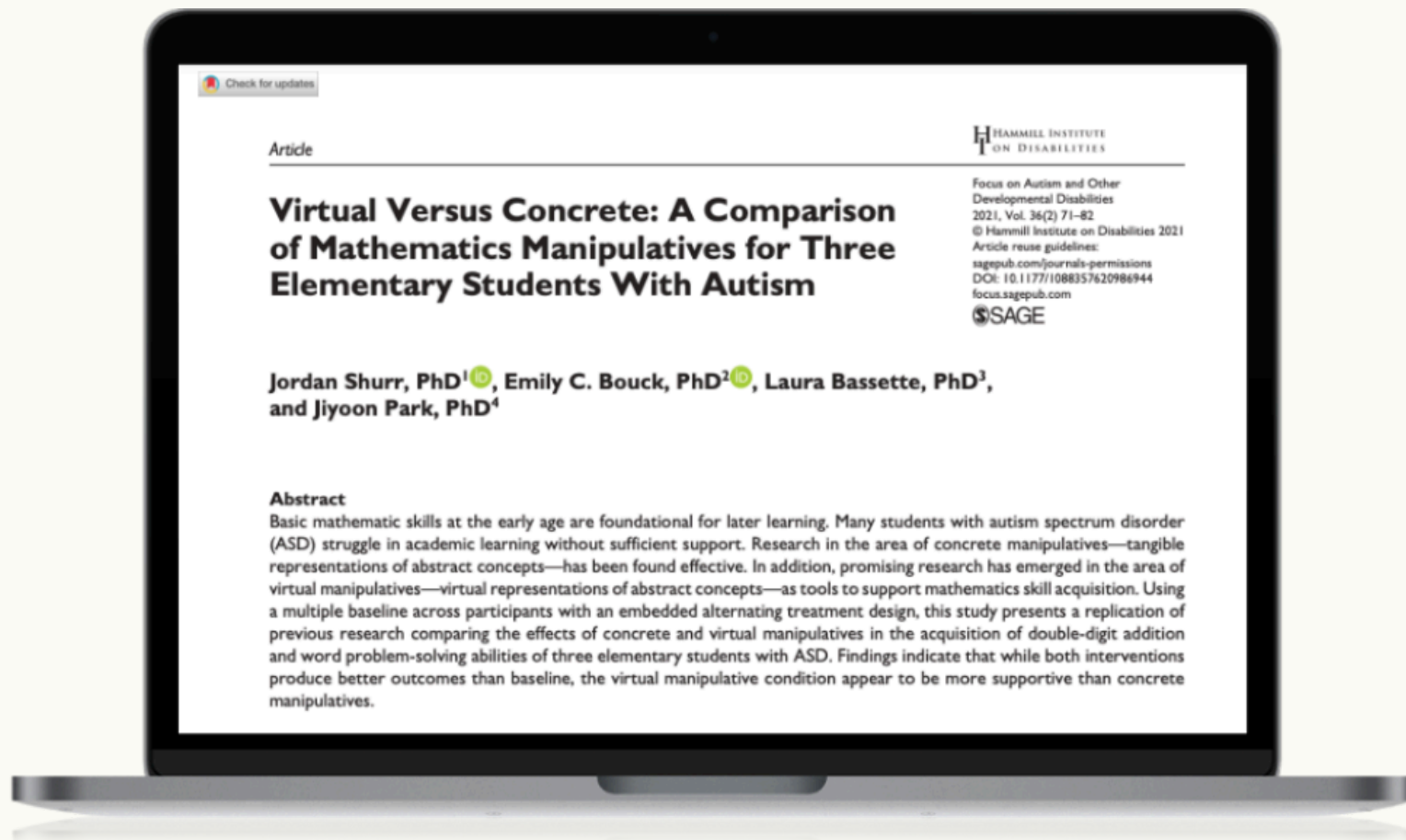
Findings

- **Results mirrored previous research on effectiveness of using VM over CM to support mathematical performance.**
- **Overall, the students did better on math when using either CM and VM methods than no supports (baseline).**
- **The VM condition appears to be more supportive than CM in producing more consistent and successful performance.**

Educator Take-Aways



- **Both CM and VM can be useful for supporting basic mathematical operations, with VM having a slight advantage**
- **VM can help students develop a conceptual understanding of basic mathematical skills through visualization and manipulation.**
- **Many virtual mathematic supports are easily accessible via apps or websites for use (e.g., <https://www.brainingcamp.com/>- from this study; <http://nlvm.usu.edu/en/nav/vlibrary.html>)**



Shurr, J. Bouck, E. C., Bassette, L., & Park, J. (2021). Virtual Versus Concrete: A Comparison of Mathematics Manipulatives for Three Elementary Students With Autism. Focus on Autism and Other Developmental Disabilities, 6(2), 71-82.
<https://doi.org/10.1177/1088357620986944>