LINDAMOOD-BELL
LEARNING PROCESSES

RESEARCH

The Role of Brain Activity in Characterizing Successful Reading Intervention in Children with Dyslexia

Seeing Stars for Phonological and Orthographic Processing in Reading and Spelling (SI)

On Cloud Nine for Visualizing and Verbalizing for Math

PROFILE:

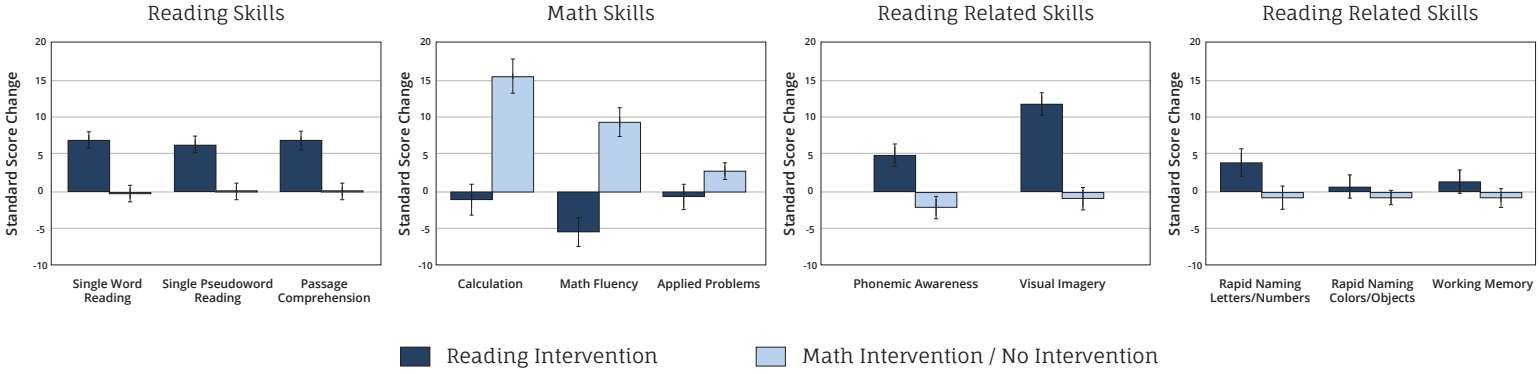
Number of Students: 31 **Age:** 7.4 - 12.6

Programs Implemented:
- Seeing Stars
- On Cloud Nine

Outcome Measures:
- WASI
- Woodcock-Johnson

BACKGROUND:

This NIH-funded study examined the relationship between reading and math skills, and was conducted by the Center for the Study of Learning, Department of Pediatrics at Georgetown University Medical Center. Children with dyslexia were assigned to a phonological- and orthographic-based tutoring period in the Seeing Stars program as well as a within-subjects control period, using the On Cloud Nine math program, to examine intervention-induced changes in reading and math learning behavior as associated with brain activity. The intensive intervention focused on promoting reading through phonological and orthographic skills. The study was designed to examine, 1) intervention-induced changes in behavior and brain activity, and 2) related behavioral and brain activity pre-intervention data that revealed predicted intervention-induced gains in reading and math performance.



The graph above shows standard score changes in behavioral measures following intervention: reading skills, phonological and orthographic reading- related skills, other reading related skills (rapid naming and memory), and math skills. Highlights: Large standard score changes on the calculation and math fluency measure following OCN instruction. Following Seeing Stars intervention, students made large gains on word reading and passage comprehension.

RESULTS:

Overall, the students made strong gains in both reading and math performance, the two skills developed in the intervention. These gains were specific to the reading intervention, as the control math intervention resulted in gains on math but not on reading measures. The study concludes that behavioral changes (growth in reading and reading-related skills) were "significant, specific, and enduring." The researchers also concluded that individual brain changes were too variable among study participants to determine specific patterns of growth in neural activation at the group level.

LOCATION:

Center for the Study of Learning, Department of Pediatrics, Georgetown University Medical Center, Washington, DC, United States

Krafnick, A. J., Napoliello, E. M., Flowers, D. L., & Eden, G. F. (2022). The role of brain activity in characterizing successful reading intervention in children with dyslexia. *Frontiers in Neuroscience*, 16. doi=10.3389/fnins.2022.898661