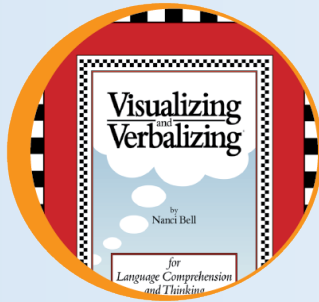




Changes In Intrinsic Connectivity of the Brain's Reading Network Following Intervention in Children with Autism



Visualizing and Verbalizing for Language Comprehension and Thinking (V/V)

PROFILE:

Number of Subjects:

- 16 Visualizing and Verbalizing
- 15 Control

Age: 8-13

Program Implemented:

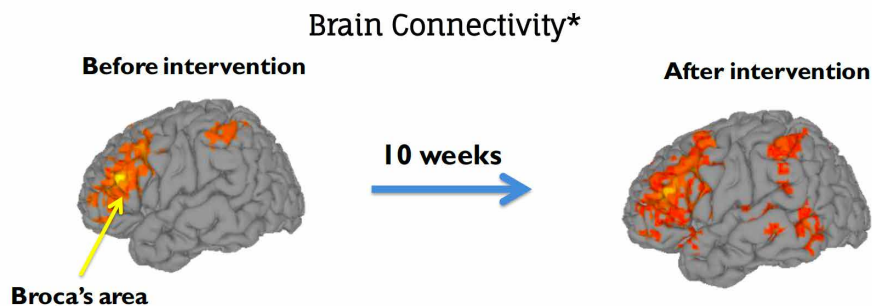
- Visualizing and Verbalizing®

Outcome Measures:

- Brain connectivity (fMRI)
- Gray Oral Reading Tests-4th (comprehension)

BACKGROUND:

The University of Alabama at Birmingham Department of Psychology in collaboration with Lindamood-Bell Learning Processes conducted a randomized controlled trial involving children with Autism Spectrum Disorders (ASD). This experiment investigated the constructs of Dual Coding Theory (DCT) using the Visualizing and Verbalizing (V/V) program, which develops concept imagery for comprehension. Resting state functional magnetic resonance imaging (rsfMRI) was used to study the effect of V/V on connectivity of regions of the brain associated with comprehension. Children with ASD typically have weaker connectivity, or underconnectivity, in these areas of the brain. Before and after instruction, children's brains were scanned and they were administered a reading comprehension test. A similar group of children with ASD went through the same procedures but did not receive V/V instruction (i.e., control group). Children in the V/V group received approximately 200 hours of instruction over a 10 week period of time. Instruction was delivered by specially trained Lindamood-Bell staff. The figure below shows pre- and posttest connectivity for the V/V group.



Note. *Statistically significant ($p \leq .05$). Broca's area is a region of the brain involved in comprehension. Figure used with author's permission.

RESULTS:

On average, the V/V group exhibited significantly greater brain connectivity after instruction than the control group. In addition, The V/V group also had a significantly ($p = .0006$) larger change in reading comprehension than the control group (16.4% and 2.6% respectively). Furthermore, researchers found that improvements in reading comprehension were correlated with increases in brain connectivity. The results of this study illustrate that instruction in the Visualizing and Verbalizing program supports the Dual Coding Theory model of cognition, leading to greater brain connectivity and improved comprehension for children with Autism Spectrum Disorders.

LOCATION:

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