3 New Research Findings on Fast ForWord

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The prevalence of language and attention-based learning disorders (like dyslexia) among children remains one of the major obstacles facing education. But as new research illuminates their underlying neurological characteristics, the potential for overcoming these obstacles continues to grow. Three recent findings across multiple studies highlight the effectiveness of the Fast ForWord program in improving educational outcomes along with their deeper brain-based correlates through its computerized training

1. Processing of "tone doublets" is impaired in children with language issues, and is improved following Fast ForWord training.

Previous research has suggested that many instances of language impairment in children may be rooted in low-level auditory processing disorders. One particular auditory deficiency frequently observed in language-impaired children is difficulty processing rapid sound changes. A recent study has demonstrated that this type of processing can be improved through Fast ForWord's targeted audiovisual regimen (Heim, Keil, Choudhury, Friedman, Benasich, 2013); (Heim, Choudhury, Benasich, 2015).

In their initial visit, a group of children aged 6 to 9 formally diagnosed with language learning impairment (LLI) as well as a control group of similarly-aged children with no diagnoses were asked to identify sound changes in nonverbal 'tone doublets' consisting of a high and low tone played in rapid succession, as well as consonant syllables like 'ba' and 'da'. As they did so, their brain activity was recorded through electroencephalogram (EEG) and event-related-potential (ERP) measurements.

Consistent with prior research, the language-impaired children took longer to identify sound changes and showed lower levels of brain activity. **After participating in Fast ForWord's phoneme identification exercises for an average of 32 days, this group was tested again in a second visit, where their measurements showed a significant increase in brain activity.** Children in the control group, who did not undergo the Fast ForWord training, showed much slighter improvement on their second visit, suggesting that the improvement of the test group could not be attributed to practice or familiarization effects.

2. Language and reading assessments improved after Fast ForWord.

There is significant evidence that measurements of brain activity have a strong correlation with observed educational performance. In the aforementioned 2013 study, the language-impaired children also showed significant improvement in their performance on the standardized CELF (Comprehensive Evaluation of Language Fundamentals) language test, with their scores increasing by an average of 10% between the two assessments.

An earlier study in 2008 had demonstrated similar results (Stevens, Fanning, Coch, Sanders, Neville, 2008). Here, a sample group of elementary school-aged children diagnosed with specific language impairment (SLI) were tested alongside two control groups of children with typical language development. Children in all three groups completed the standardized CELF evaluation. They were then presented with audio of two narrated stories playing simultaneously and asked to pay attention to only one of them, while their responses to various verbal and non-verbal stimuli embedded within each story were recorded through ERP to measure selective auditory attention. As

expected, both sets of scores were lower for the SLI group, with no significant difference between the two control groups.

After this first assessment, the SLI group and the first control group received Fast ForWord training for six weeks, while the second control group did not. All three groups then participated in another audio listening session before taking another CELF evaluation at the end of the study. The results were extremely promising. Not only did the **language-impaired children improve by about 10% over their initial CELF score – the control group that received Fast ForWord training showed a smaller but significant improvement as well.** A similar pattern was seen in the ERP measurements of selective auditory attention, suggesting that the two measurements were in fact correlated and that Fast ForWord training can enhance both auditory processing and language performance in language-impaired and typically developing children alike.

3. Fast ForWord training improves brain networks found in children with language learning impairment, specific language impairment or dyslexia.

Although dyslexia is a more specific disorder whose observed symptoms are commonly associated with reading, it is strongly believed to be rooted in phonological processing difficulties – the inability to hear distinct phonemes that can then be visually associated with written letters. Accordingly, a 2003 study found that, compared to non-dyslexic children, those with dyslexia showed lower levels of brain response in their brain's audio processing areas when asked to look at a succession of written letters and select the ones that rhyme. This was indicated by functional magnetic resonance imaging (fMRI) scans of brain activity, with the sharpest differences observed in the temporal left region. After a period where Fast ForWord intervention time was included as part of their regular school day, not only did **the dyslexic children's performance scores improve, but their fMRI scans began to more closely resemble those of the typically developing children**, suggesting that the training was actively rewiring their brains' networks to function more effectively in language processing.

Furthermore, a 2015 review of similar studies showed that phonological training improved brain functioning in children with conditions ranging from dyslexia to SLI and general reading difficulties. Of 20 studies surveyed, four used Fast ForWord as their training content. Across all studies, improvements included increased activation of certain brain regions, stronger and faster neural responses, and even an increase of white matter. Follow-ups conducted in several studies also showed that these improvements were maintained even a year after the original intervention. **These results suggest that phonological and auditory intervention has the potential for actively rewiring neural networks to function more effectively in language processing, leading to lifelong gains in behavior and educational performance.**

References

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Remediation Training Improves Reading Ability of Dyslexic Children