

# Evaluating New Training Programs

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On January 5, 1996, *Science* published two papers by Michael Merzenich, myself, Steve Miller, and Bill Jenkins reporting dramatic improvements in language skills (on average 1.5 years gain) after only 4 weeks of training with a novel computer-based intervention program. Follow-up testing showed that these language processing gains were not only sustained, but in many cases also incorporated into improved social and academic abilities. The magnitude of improvements suggested that in addition to their scientific relevance, these results had the potential for considerable clinical benefit.

Scientific Learning Corporation, a company founded to develop the clinical potential of this research, recently released Fast ForWord, a series of seven computerized exercises that hierarchically train important components of auditory processing, memory, phonological analysis, and grammar. Fast ForWord is a training program based on over 100 published research articles that showed children with language-learning difficulties have trouble processing sounds fast enough to distinguish rapid acoustic changes in speech, and further research into how the brain processes and learns language.

As we enter the 21st century, there will be "nay sayers" who, burnt by past failures, resist moving forward. New remediation procedures may raise old fears and we recognize that we still have a great deal to learn about the origins and treatment of various types of learning impairment. However, my colleagues and I at Scientific Learning Corporation feel passionately that we cannot watch children languish in classrooms in light of these new data. We are dedicated to working with professionals and parents to bring these basic research advances out of the laboratory and into the lives of the many language learning impaired children who have the potential to benefit from them.

In pursuit of this goal, and with the collaboration of 60 independent professionals at 35

sites in the United States and Canada, Scientific Learning Corporation recently field-tested the Fast ForWord program with 500 children ages 4-14 years being treated in public schools, private schools, private practice and clinics. The aim was to determine whether laboratory results a) could be replicated in schools and clinics with a much larger number of children, and b) if they would generalize to children with a broader range of problems that included, but were not limited to, language processing like pervasive developmental disorder (PDD)/autism, attention deficit disorder (ADD), dyslexia, and central auditory processing deficit (CAPD).

Fast ForWord alters the acoustics of speech so the children can understand them, and using principles derived from neuroplasticity research, adaptively speeds up the rate of neural processing. Leveraging 20 years of neuroscience research, Fast ForWord employs fun—computer exercises with animated rewards—to help children process the fundamental elements of speech and learn grammar. The computerized program tracks individual performance and recognizes correct responses. Fast ForWord knows how much acoustical modification the individual child needs and continuously adapts accordingly. Daily training data is sent over the Internet to Scientific Learning Corporation where it is analyzed, graphed, and returned to the certified provider. As progress continues, the brain learns how to

process acoustical signals at a faster and faster rate, moving the child to a more age appropriate level of language.

The field trial results, reported first at the ASHA Convention, show that the dramatic improvements in auditory processing rate, phonological processing, and language comprehension demonstrated in controlled laboratory studies were replicated clinically. Highly significant improvements in language functions were achieved in children experiencing language processing difficulties in the context of a variety of clinical diagnoses including PDD/autism, specific language impairment, CAPD, ADD, and dyslexia.

Before Fast ForWord training, the population of children participating in the trial had a distribution of language quotients well below the mean of normal. After training, the distribution of these same children moved well within the normal range. We are unaware of any other treatment program that shows comparable gains in processing and language functions, within such a short training period, that has been empirically validated using scientific methods.

Based on these results, the Fast ForWord program is now available for clinical and educational use through licensed professionals who have completed a Scientific Learning Corporation training seminar. We must move forward. **■**

*Paula Tallal, an experimental neuropsychologist and board certified clinical psychologist, is Professor II and co-director, Center for Molecular & Behavioral Neuroscience, co-director of the Behavior and Neuroscience Doctoral Program at Rutgers University, Newark, NJ; and executive vice president, Scientific Learning Corporation, San Francisco, CA. Regarding Mabel Rice's article, Tallal wishes to say, "What Dr. Rice observed was a laboratory prototype of only one computer exercise, not the current Fast ForWord program. Fast ForWord has been developed by Scientific Learning Corporation as a comprehensive training program comprising seven computerized components. We encourage Dr. Rice to use the Fast ForWord program so that she can evaluate its effectiveness first hand." Information about Fast ForWord and how to become a trained provider can be found on the Scientific Learning web site at <http://www.scientificlearning.com>. Call Scientific Learning Corporation at (415) 296-1470, or write to 417 Montgomery Street, Suite 500, San Francisco, CA 94104. Contact Tallal via email: [info@scilearn.com](mailto:info@scilearn.com)*

