

Fast ForWord Products Open a Child's Window to Language
By Dr. Martha Burns

*This is a condensed version of an article that was published in the March-April 2003 issue of the Autism Asperger's Digest magazine, www.autismdigest.com. Reprinted with permission. The unabridged version was selected from over 500 articles to appear in **The Best of the Autism Asperger's Digest, Volume 1**, a collection of the best articles that have been offered during the Digest's first 5 years of publication. The book is planned to release early this summer, through the Digest's parent company, Future Horizons, Inc.*

Clinicians and therapists can have a dramatic impact on children with autism if they work systematically and build upon essential foundational skills. Scientists continue to explore which foundational systems need to be stimulated, and in what ways, to maximize our impact on each child. Among the sensory systems that need careful stimulation in children with autism and Asperger's Syndrome are auditory processing skills. Most professionals and parents believe that auditory processing disorders are a core component of the attention, memory and language difficulties of these children.

For almost 30 years, Dr. Paula Tallal has been studying the relationship between auditory processing, attention, memory and language learning. Based partly on her work, scientists have found that one important aspect of learning speech and language is timing. Some children attend to and perceive slowly changing sounds – such as animal sounds and music -- more easily than quickly changing sounds, such as speech. For children with auditory processing difficulties, speech, where the sound wave is very complex and changes rapidly, is much harder to focus on and perceive.

To get a feeling of how fast speech is, think of counting time in seconds, as “one one-thousand, two one-thousand.” This uses four syllables for a second of time. So, single syllables of speech are usually 1/4 second long. Within that syllable, there are often three or more speech sounds a child or adult has to perceive. Some complex words, like “specks” or “stretched,” have five speech sounds. Dr. Tallal and her colleagues have found that many children who struggle to learn language have a listening “window” that is slower than 1/4 second long. Many children for whom speech is unclear because of slower listening “windows” tend to ignore speech or tune out when they are spoken to.

Dr. Tallal thought that if speech could be slowed down to a rate that matched a child's listening “window”, it should be easier for them to perceive and learn. She collaborated with Dr. Michael Merzenich, best known for his research on brain plasticity (the notion that the human brain can remodel itself when information is presented in the right way), to develop a system for presenting speech sounds and language learning activities.

Although we always knew our brains could learn new complicated tasks, especially if they build on skills already acquired at a young age, Dr. Merzenich and other neuroplasticity researchers demonstrated that the adult brain can change even in fundamental ways like manual dexterity and perception of sound. The great news for children with autism or Asperger's Syndrome is that despite existing processing strengths or limitations, they too can remodel their brains to learn and use language faster and better.

Dr. Merzenich and Dr. Tallal developed a computer-based learning tool that drives the brain to handle faster and faster auditory information while at the same time teaching speech sound distinctions and language skills. The technology was patented and the product was released commercially as Fast ForWord in 1997 (it has since been renamed “Fast ForWord Language”).

The Fast ForWord Language product is comprised of seven training exercises, each designed to stimulate a different fundamental skill needed for effective communication. One exercise simply enables children to perceive and sequence two different tones that are presented at increasingly

faster rates. Three other exercises (“sound exercises”) train children to distinguish sounds of English. The final three exercises teach new word meanings, grammatical meanings, and improve the ability to follow long complicated directions.

The child works on five out of seven of these carefully designed processing and language activities for twenty minutes each, five days a week, for six to ten weeks or longer. For children with autism and Asperger’s Syndrome, many therapists who have used Fast ForWord Language agree that the intensive training is an important key to the success of the training process.

The success of Fast ForWord Language in remodeling the brain was recently demonstrated with the brain imaging technique of Functional Magnetic Resonance Imaging (fMRI). A team of researchers at Stanford University headed by Dr. Elise Temple has shown that adults and children with dyslexia change the brain regions they use for processing of auditory information after they use the Fast ForWord Language products.

Fast ForWord Language has been successfully used with hundreds of children with autism and Asperger’s Syndrome nationwide. Early data compiled by Scientific Learning Corporation on children with autism spectrum showed one- to three-year gains in receptive and expressive language skills, auditory perceptual skills, and auditory memory after six weeks of training on Fast ForWord.

Gigi Poglitsch and Marci Melzer reported retrospective data on 100 children with autism or Asperger’s Syndrome at the Annual convention of the American Speech and Hearing Association in November 1999. They had collected information from language therapists around the nation who had used Fast ForWord Fast ForWord Language with children with autism. Most therapists reported gains in listening, memory, attention and language of two years or more after 10 to 12 weeks of training. Since 1999, therapists around the country and abroad have used Fast ForWord Language with many children with autism and Asperger’s Syndrome.

BIO

Dr. Martha Burns has been a practicing speech and language pathologist in Evanston, Illinois, for over 35 years. She is an adjunct Associate Professor at Northwestern University and serves on the professional staff of Evanston-Northwestern University Health Care. She has written three books on language difficulties associated with neurological disorders and a test entitled the Burns Brief Inventory of Communication and Cognition. She currently serves as the Director of the Clinical Specialty Market for Scientific Learning Corporation.

REFERENCES

Benasich, AA and Tallal, P (1996) Auditory temporal processing thresholds, habituation, and recognition memory over the 1st year. *Infant Behavior and Development*, 19(3), 339-357.

Merzenich, M.M., Jenkins, W.M., Johnston, P., Schreiner, C.E., Miller, S. L. and Tallal, P. (1996) Temporal processing deficits of language-learning impaired children ameliorated by training. *Science*, 271, 77-80.

Schwartz, Jeffrey M., and Begley, Sharon (2002) *The Mind and The Brain: Neuroplasticity and the Power of Mental Force*. New York: HarperCollins Publishers, Inc.

Tallal, P. and Piercy, M. (1973) Deficits of non-verbal auditory perception in children with developmental aphasia. *Nature* 241 (5390): 468-9.

Temple, E., Poldrack, R.A., Protopapas, A., Nagarajan, S. Salz, T., Tallal, P., Merzenich, M.M., and Gabrieli, J.D.E. (2000) Disruption of the neural response to rapid acoustic stimuli in dyslexia: Evidence from functional MRI. *Proceedings of the National Academy of Sciences* 97(25), 13907-13912.