Fast ForWord

intensive programs open a child's window to language

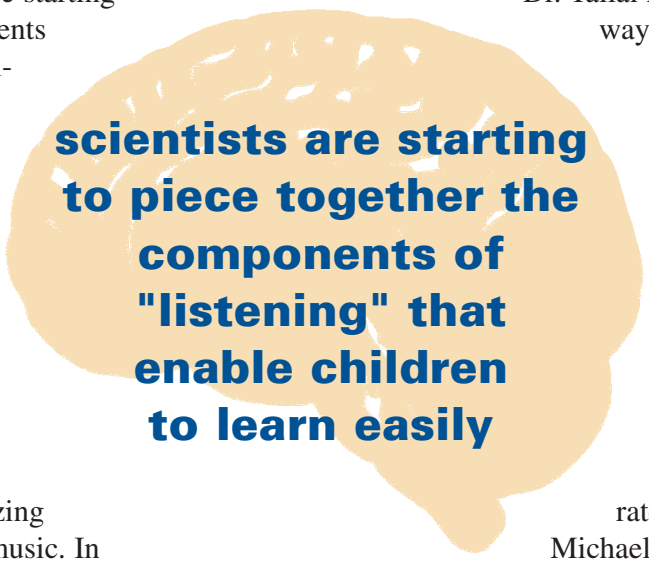
By Martha S. Burns, Ph.D., CCC-SLP

New breakthroughs in brain scientists' understanding of the ways the brain processes language and how the brain continuously remodels itself to become more efficient are changing the ways we work with children with autism and Asperger's Syndrome.

As a speech-language pathologist who has worked with children on the autism spectrum for over 35 years, I am pleased that therapists in all disciplines now realize that we can have a dramatic impact on children and adults with autism if we work systematically and build upon essential foundational skills. We now know that children respond most effectively when we provide hours of one-on-one intervention carefully matched to the child's own perceptual/cognitive system each day. We know we must start as early in life as possible and guide parents to use their knowledge and experience with their child to mold programs that stimulate the child in essential areas.

What scientists continue to explore, however, is which foundational systems need to be stimulated, and in what ways, to maximize our impact on each child. Foundational systems that children with autism and Asperger's likely need to build include sensory mechanisms, body concept, and interactional skills. Among the sensory systems that need careful stimulation 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 children with autism and Asperger's Syndrome.

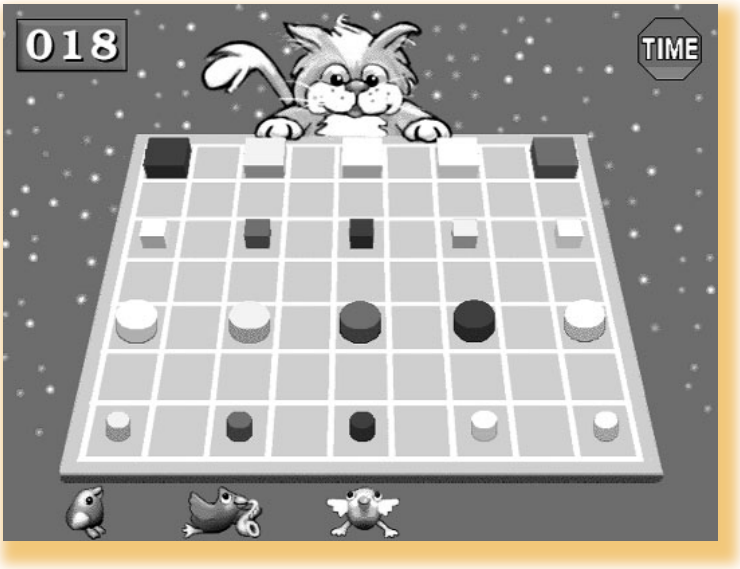
For almost 30 years, Dr. Paula Tallal has been studying the relationship between auditory processing, attention, memory and language learning. Dr. Tallal published her first research on this in 1973 and has been refining her understanding of auditory processing disorders and learning ever since. Based on her research and that of others interested in hearing and brain processing, scientists are starting to piece together the components of "listening" that enable children to learn easily. They have found, among other things, that one important aspect of learning speech and language is timing. Some children, apparently, attend to and perceive slowly-changing sounds more easily than quickly changing sounds. These children may be great at recognizing animal sounds and learning music. In these cases each new sound lasts a reasonably long time (in brain processing measures.) But 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 the way many of us have learned to count time in seconds, "one chimpanzee, two chimpanzee"….or "one one-thousand, two one-thousand," etc. Each of these counting measures 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 that occur within that 1/4 second time period. 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. In other words, they can perceive melodies easily but speech seems muddy to them. Researchers are finding that this listening "window" varies from person to person and family to family. It may explain, in part, why some families have many musicians or artists among their relatives while others have college professors. But it seems that many children for whom speech is muddy or unclear because of slower listening "windows" tend to ignore speech or tune out when they are spoken to. Certainly many children with autism or Asperger's Syndrome fit this description.

Dr. Tallal reasoned that there must be a way to make the speech clearer for these children. Just as we use glasses to make vision clearer for persons with astigmatism or near-sightedness, 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. Several years ago she collaborated with a brain scientist, Michael Merzenich, to develop a system for presenting speech sounds and language learning activities using, what some people have called, "glasses for the ears".

Dr. Merzenich is best known for his research on brain plasticity, the notion that the human brain is very flexible and can remodel itself when information is presented in the right way. Adults see the brain's ability to remodel itself when we improve our golf game after a good lesson and a few weeks of practice, master a difficult new piano piece, or take up tennis at 40. But, 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 caused quite a stir when they demonstrated that the adult brain can change even in fundamental ways like manual dexterity and perception of sound. Scientists now realize that so called "innate brain systems" change dramatically, and in relatively short periods of time, if we exercise intensely and systematically. 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.



After hearing Dr. Tallal present her findings at a national conference, Dr. Merzenich joined with Dr. Tallal to develop a computer-based program that literally drives the brain to handle faster and faster auditory information while at the same time, teaching speech sound distinctions and language skills through the "glasses for the ears." Since Dr. Merzenich was also on the team that developed the cochlear implant for restoring hearing to deaf children and adults, his knowledge about the brain processes in hearing and brain plasticity gave him the scientific background needed to tackle a project to help mold children's brains to process language (which is learned through hearing) more quickly and accurately. The technology developed to create the computer-based intensive program was patented and the program itself released commercially as Fast ForWord in 1997. The program has since been re-named, Fast ForWord Language.

The Fast ForWord Language program is comprised of seven training exercises, each designed to stimulate a different fundamental skill needed for effective communication. One exercise is designed simply to enable the children to perceive and sequence two different tones that are presented at increasingly faster rates. This activity increases the processing speed of the child. Three other exercises train the child to distinguish sounds of English. These are called "sound" exercises. Initially the child hears the sounds clarified using the "glasses for the ears" technology that slows down the rapidly occurring parts of the sound or syllable. As the child's processing speed increases so does the speed of sounds the child hears and must differentiate.

The program has three training exercises that teach new word meanings, grammatical meanings, and improve the ability to follow long complicated directions. As with the "sound exercises" the "word exercises" begin with the sounds clarified for the child by slowing down certain aspects that are hard for a child to perceive. As the child masters the words or sentences with the clarified speech the speed is gradually accelerated towards a normal rate. 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 more. 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 program.

The success of Fast ForWord Language in remodeling the brain has recently been demonstrated through use 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 go through the Fast ForWord Language program. Whereas before the program they demonstrated less use of their left hemisphere regions that individuals without reading problems customarily rely on for the same tasks, after the program they used the same brain regions as persons without dyslexia.

Fast ForWord Language has been successfully used with hundreds of children with autism and Asperger's Syndrome nationwide during the past five years. Children have received the program in their schools or through private speech-language pathologists. Early data compiled on children with autism spectrum diagnoses by Scientific Learning Corporation 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

Language with children with autism. They found that most of the therapists used Sensory Integration adaptations to help children who had severe difficulties attending to the activities. Many therapists used such adaptations as weighted vests, contoured seats, and special computer mouse adjustments or roller balls to facilitate success with their children. Despite the severity of the children seen, most therapists reported gains in listening, memory, attention and language of two years or more after 10-12 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 and have formed a support group of sorts through internet list serves where they can share ideas with each other for improving the success of the program with their children.

Fast ForWord Language is only one tool for helping children with autism and Asperger's Syndro]me to reach their potential. But, research and clinical use have shown it to be an extremely effective method for opening the child's window to language. Fast ForWord Language enables the child with autism or Asperger's Syndrome to process speech more easily. But, as important, therapists who use the program report that it intensively retrains the brain to process faster and more efficiently so that other interventions are easier to implement and progress more quickly.

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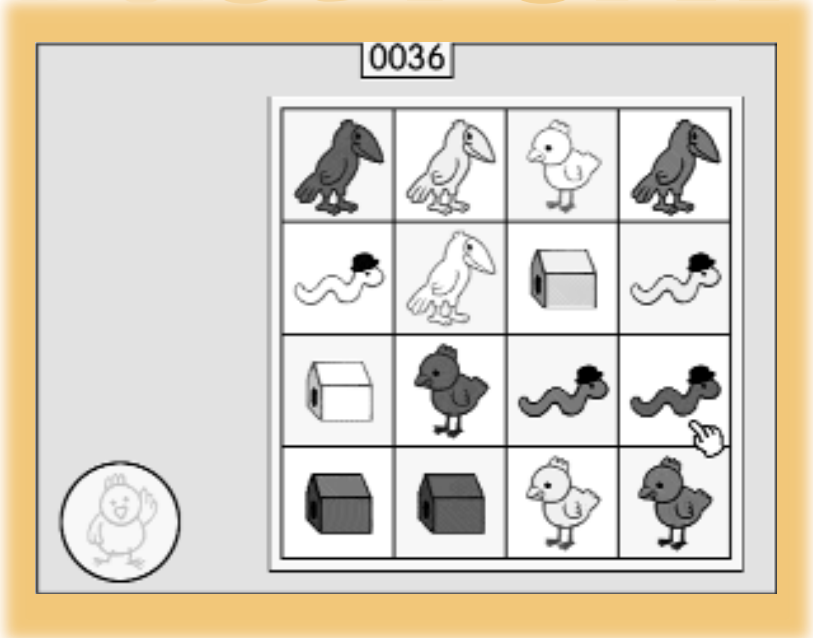
Fast ForWord Language



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 Senior Clinical Specialist at Scientific Learning Corporation. Dr. Burns can be reached for further information at mburns@scilearn.com or by calling Scientific Learning Corporation at 800-665-9797 ext. 8801.

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