

A brief introduction to...

Therapeutic Listening®

"A problem with perception may cause a cognitive deficit, which may then lead to social impairments, loss of self-esteem, and a failed life" (Ratey, 2002, p. 8).

"The neural processing of sound can be classified as one of the primal forms of sensory integration because it has long been a major source of information regarding basic survival" (Ayres 1972, p. 71).

"The fact that the auditory system evolved out of another system closely related to the current vestibular system leads to hypothesizing a closer relationship than might seem apparent judging from a casual subjective consideration of the two senses" (Ayres 1972, p. 72).

"Everything to be gained by vestibular input gets refined when you add sound" (Frick, 2006).

"Listening is the key in all our overall ability to orient to the people, places, and things in everyday life" (Frick, 2006).

A Critical Link in Sensory Integration

Jean Ayres' groundbreaking work in the field of sensory integration brought to light the critical importance of integrating information from our senses for the organization of movement, learning, and behavior. A primary focus of sensory integrative treatment is to enhance sensory processing through the vestibular, proprioceptive, and tactile senses to facilitate self-generated, goal-directed activity.

Recent clinical practice demonstrates the efficacy of incorporating sound into sensory integrative treatment strategies. In fact, many experts agree that the auditory system is a critical link in sensory integration theory. Therapeutic Listening® is an innovative program for providing high quality auditory input within the context of sensory integrative treatment.



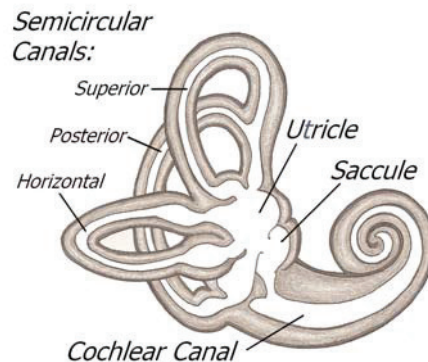
Listening is a Sensory Integrative Experience

Sensory integration is the ability to organize sensory input from the body and the environment and to incorporate it adaptively in meaningful occupations. In everyday listening we are doing just that - attending selectively to auditory information and integrating it with other salient sensory data.

Listening is a voluntary, survival-related, whole brain, and whole body process. The survival of an animal living in the wild depends on its ability to listen and monitor and then actively respond to changes in the environment. Because of its importance in survival, Ayres acknowledged that the processing of sound could be classified as one of the 'primal forms of sensory integration'.

Cochlear and Vestibular - All One System

While the vestibular system has played a major role in sensory integration theory, its unity with the auditory system has been less acknowledged. Anatomically, there is no clear boundary



between the two systems - the cochlea, utricle, saccule, and semicircular canals are formed by a single bony labyrinth in the inner ear. The vestibular end of the canal processes the lower frequency vibration that we call movement while the cochlear end processes the higher frequency vibration that we know as sound.

Neurologically, the two systems function in similar ways with hair-like receptors moving in a fluid filled canal. In addition, they share a single cranial nerve for sending information to the brainstem, and cross paths and exchange information with each other at every step of the way. To acknowledge this essential unity, we refer to this as the vestibular-cochlear continuum or the vestibular-cochlear system.

What is Listening?

Listening is the process of detecting sound and organizing and integrating it for use with information from other senses. Listening skills include both conscious and unconscious processes. Although we are not aware of it, we constantly monitor the ambient auditory environment. When a salient sound occurs, we shift our attention to *orient*, *locate*, and *select* that sound for further investigation. This constant monitoring occurs in key centers in the brain and is a critical first step to a myriad of functions including attention and integrated sensory processing. It is largely done unconsciously so that cortical pathways are free to perform higher level functions. On a more conscious level we voluntarily *attend* to sound and *discriminate* and *interpret* sound.

Both ends of the vestibular-cochlear system are involved in orienting us to our surroundings. The vestibular orients us to our place on earth and the auditory orients us to the space that surrounds us. Many of the individuals who have sensory processing and sensory integration difficulties also

Therapeutic Listening
coupled with SI tends to speed the emergence of:

- Attention
- Organized behavior
- Self regulation
- Postural control
- Bilateral coordination
- Praxis
- Fine motor control
- Oral motor/articulation
- Social skills
- Communication
- Visual motor integration

have listening difficulties. This is clearly seen in individuals with auditory defensiveness or auditory over-reactivity. These individuals often will cover their ears in response to low frequency sounds such as vacuum cleaners, blenders, and hair dryers or high pitched or sudden sounds such as sneezing, or screaming.

What is Therapeutic Listening?

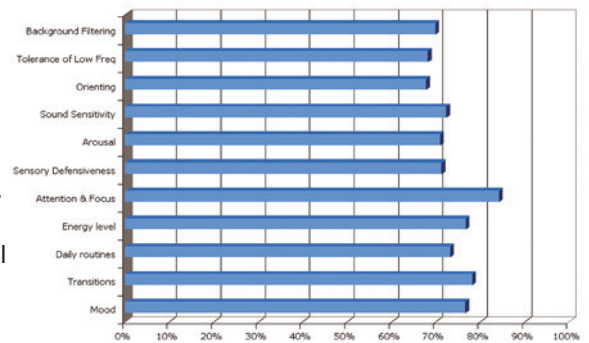
Therapeutic Listening (TL) is an expansion of Sensory Integration. It is an auditory intervention that uses the organized sound patterns inherent in music to impact all levels of the nervous system. Auditory information from Therapeutic Listening CDs provides direct input to both the vestibular and the auditory portions of the vestibular-cochlear continuum. The emphasis of TL is on blending sound intervention strategies with vestibulo-proprioceptive, core development, and breath activities so as to sustain grounding and centering of the body and mind in space and time. Providing these postural, movement, and respiratory activities as part of the TL program is critical.

Therapeutic Listening utilizes numerous CDs that vary in musical style, types of filtering, and level of complexity. The music on Therapeutic Listening CDs is electronically altered to elicit the orienting response which sets up the body for sustained attention and active listening.

2005 Survey on Therapeutic Listening

The graph on the right shows partial results from our survey of nearly 5,000 practitioners who have been trained in Therapeutic Listening.

% of Therapists who saw positive changes in more than 50% of their cases



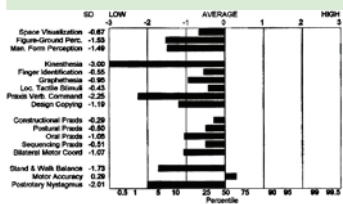
Listening Skills

To the untrained eye, it is often difficult to assess listening skills. Since we cannot directly observe internal listening processes, we must infer listening function through behavioral clues. This task is especially difficult due to the extremely wide range of behaviors associated with poor listening skills and the fact that the behaviors are not linked to listening in an obvious way such as cupping one's hand behind the ear.

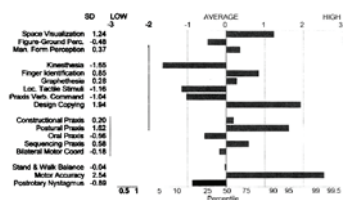
My World Comes Alive - Sara's Story

Sara was adopted by American parents from a Russian orphanage at the age of four and spoke no English when she began school at age five. Her pre-intervention status showed that she could only attend to tasks for 5-10 minutes and had tactile hypersensitivity - she disliked hugs and was a picky eater - refusing certain textures and temperatures of food. Sara had extreme difficulty calming herself for sleep, was easily frustrated and prone to tantrums, and had extreme difficulties with transitions. She also had minimal eye contact with others and a high, shrill voice which she could not modulate.

Sara's SIPT Scores
August 2004 & March 2005



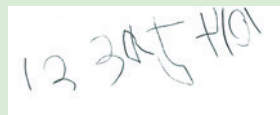
After initial testing, her occupational therapist saw her every other week and started her on a Therapeutic Listening program which was implemented by her parents 2X/day and 7 days a week from August 2004 to March 2005. Dramatic changes in her ability to process sensation are shown in her pre and post SIPT scores. Although she had a continued tendency to reverse some letters and numbers, Sara's handwriting showed marked improvement in both her fine motor control and her ability to use space.



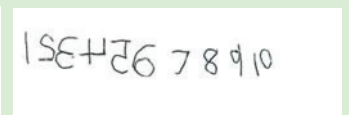
Everyone knew her listening skills had improved when she reported hearing a clock ticking and birds chirping for the first time. Through her drawings Sara clearly showed how her world had come alive.

Gail Heucker, OTR

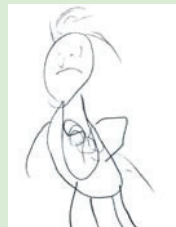
Numbers - August 2004



Numbers - March 2005



Draw-A-Person
August 2004



Draw-A-Person
February 2005



"Perception is much more than simply sensing stimuli from the outside world. It is an enormous factor in personality development. Even the smallest ongoing perception problem can lead to a cascade of events that can result in a psychologically traumatic life" (Ratey, 2002, p. 82).

"If your hearing is crippled by an undiagnosed auditory problem, the natural conclusion is that you are either stupid, indifferent, or both" (Ratey, 2002, p. 7).

For example, when children with Central Auditory Processing Disorder (CAPD) were compared with typical peers, researchers found large differences in classroom, social-emotional, and disinhibition behaviors (Burleigh, McIntosh, & Thompson, 2002). Although *poor listening skills do not necessarily point to a diagnosis of CAPD*, this list illustrates the wide range of behaviors that are associated with listening difficulties.

Behavioral Difficulties Observed in Children with CAPD		
Classroom Behaviors	Social-Emotional Behaviors	Disinhibition Behaviors
Daydreaming/Forgetfulness	Increased anxiety and tension	Irritability
Excessive talking in class	Low self-confidence	Hyperactivity
Inability to sit still	Increased frustration	Impulsivity
Difficulty with time concepts	Attention seeking	Disobedience
Inability to complete work	Temper tantrums	Rowdiness
Dislike of school	Easily upset in new situations	Oppositional behavior

By providing precise input simultaneously to both ends of the vestibular-cochlear continuum, Therapeutic Listening can have a positive impact on sensory function and on the nervous system as a whole. As listening skills improve, not only is an individual better able to negotiate interaction with others through an enhanced ability to hear and understand speech sounds, but he or she is also better able to orient and attend to salient sensory information and regulate physiological state. Having a solid foundation in these important skills then frees up valuable cortical resources for connection, engagement, communication, new learning, and other higher level skills.

References

- Ayres, A.J. (1972). *Sensory integration and learning disorders*. Los Angeles: Western Psychological.
- Burleigh, J.M., McIntosh, K.W., & Thompson, M.W. (2002). Central auditory processing disorders. In A.C. Bundy, S.J. Lane, & E.A. Murray (Eds.). *Sensory integration: Theory and practice* (2nd ed., pp. 141-161). Philadelphia: F.A. Davis
- Ratey, J.J. (2002). *A user's guide to the brain: Perception, attention, and the four theaters of the brain*. New York: Vintage.

My World Becomes Interesting - Adam's Story

Although initially his development seemed typical, at 13 months of age Adam completely stopped all verbal responses to social cues and about the same time stopped sleeping. His mother, Jenny reported, "He would scream for hours in a very high pitched squeal. We would take turns with him through the night. He was afraid of everything. Whenever he saw smoke or steam or dust he would panic." Hitting and banging his head became a regular occurrence and all attempts at offering comfort were fiercely resisted. "That was the hardest part," said Jenny. "There was nothing I could do."

Adam was terrified of people and when someone looked at him he would quickly cover his eyes. He hated being touched and showed no signs of affection. Any attempts at communication consisted of grunts and sounds. Although he often did not register pain, his mother and father felt that he was in great pain all the time. His appetite was poor and his diet was limited to eight starchy foods.

Adam was diagnosed with autism and, at the age of two, his parents brought him to the clinic for an occupational therapy evaluation. Through clinical observation and a sensory history it was determined that Adam had severe sensory defensiveness. A Therapeutic Listening program in combination with the Wilbarger Touch Pressure Protocol was implemented.

With his sensory defensiveness, wearing headphones was not easy for Adam. Jenny used many strategies to familiarize him with the listening protocol. "I would wear them on my head while I was cooking or just around the house" she said with a smile. Playing the CD as background music also helped Adam acclimate to the music.

Within the first month significant changes in sensory modulation occurred. His mother noted, "When Adam was screaming I would put the music on and he would begin to calm and relax. Sometimes he'd even fall asleep." He also began to sleep through the night. Babbling and eye contact were increasing. Although still cautious, his tolerance of having others in his physical space began to change and he began to explore moving his body over different surfaces in the clinic space.

In three months, Adam's previously terrifying relationship with the world was beginning to take on new meaning. His food repertoire increased by 10 different foods. Different textures and tactile experiences were becoming objects of interest. As I talked with his parents, I watched Adam intermittently kissing and rubbing his mother's face with great joy and giggles. "It feels wonderful" said Jenny with a tear in her eye. And though there were bridges yet to cross, it was touching to see how far this little boy had come.

Genevieve Jereb, OTR

Therapeutic Listening in Romania

It was so exciting to bring Therapeutic Listening to the state orphanage in Romania. Of the 25 special needs kids there, three children each week were selected for intensive programming.

The most immediate and noticeable result was the improvement in attention and focus observed in many of the children who had extreme difficulty with these skills. One girl who was described as non-verbal started imitating my English! I asked the translator what Romanian word would be useful and they said "appa" (which means water). It was a Helen Keller moment when the girl said "appa" and I spilled water into her hands which she immediately splashed onto her face.

Another little boy absolutely craved the music. He burst into our treatment room repeatedly to ask if it was his turn for "musica". I saw this boy everyday for two weeks - he would not be denied - and he was a delight. Although his medical records indicated that he had an IQ of 37, by the end of the second week he was completing progressively more challenging Mighty Minds shape puzzles. He was able to remember the color, size, and shape needed for each puzzle while propelling himself in prone across the room on a scooter board. By the end of our stay he was noticeably less fearful of new movement experiences.

Linda Westlin, OTR

Therapeutic Listening on the Children's Miracle Network

Ethan has a diagnosis of Down's syndrome. He was 2½ years old when he made his debut on the Children's Miracle Network telethon. In 4 months time, Ethan had made significant gains in his communicative abilities, use of his right hand, and walking mobility. Ethan is now exploring and interacting more in his environment.



Children's Miracle Network purchased Therapeutic Listening equipment for Hurley Children's Rehabilitation in Flint, Michigan, an outpatient hospital-based facility, to be used in a lending library program. This lending library program allowed the therapists to set up Therapeutic Listening programs and send home the equipment with the families, so the child's listening program could be done per protocol instead of in treatment sessions alone.

After 1-3 months of using the lending library equipment, families are given the option of purchasing their own equipment for continued use. Due to observed remarkable gains, families are reported to continue 90% of the time. It has proven to be a very successful set-up, made possible by Children's Miracle Network.

Who We Are

Sheila M. Frick is an internationally esteemed clinician, lecturer, and pioneer in Occupational Therapy. She has over 20 years of clinical experience and has worked in a variety of settings including psychiatry, rehabilitation, and home health before specializing in pediatrics. In 1994, the Wisconsin Occupational Therapy Association gave her the Award of Excellence for Therapeutic Practice in Pediatrics/Sensory Integration.



Sheila created and continues to develop Therapeutic Listening. She founded Vital Links in 1997 to provide continuing education opportunities focused on cutting-edge interventions. To date, over 5,000 clinicians have taken the *Listening With the Whole Body* workshop which is the introductory-level course for TL. In addition to teaching the advanced workshops on Therapeutic Listening, Sheila lectures worldwide.

Sheila has co-authored several books including *MORE: Integrating the Mouth with Sensory and Postural Functions, Core Concepts in Action, and Astronaut Training: A Vestibular-Visual Protocol for Moving, Looking, and Listening*. She also has a chapter on TL in *Sensory Integration: Theory and Practice* by Bundy, Lane, and Murray.

Mary J. Kwar is a long-time leader and clinician in the Sensory Integration movement. She runs two clinics in California in addition to lecturing extensively throughout the world on sensory integration, motor control, and vision.

Mary has a special talent for finding creative ways to engage children in activities that will be therapeutically beneficial as well as fun. Mary and Sheila have been collaborating for over a decade and they teach many Vital Links courses together.

Mary has developed a Vestibular-Visual protocol which she described in her chapter in AOTA's *Functional Visual Behavior in Children: An Occupational Therapy Guide to Evaluation and Treatment Options*. This protocol is also the basis of the Astronaut Training book that she co-authored with Sheila and Ron Frick.

Workshop Instructors

Lynette Burke, OTR and **Sharron Donnelly, MS, OTR** are both certified in SIPT and are co-owners of Advanced Pediatric Therapies in Portland, OR

Rita Montez, MS, OTR has practiced in the San Francisco area for the past 10 years and is trained in PEP and Interactive Metronome.

Lindy Joffe, MS, OTR has worked in a variety of settings in the Bay area for the past 8 years and specializes in DIR/Floortime.

Acknowledgements

We would like to acknowledge all those who contributed to the stories in this brochure, including the children, families, and clinicians in the case study vignettes - especially Sara, Adam, Ethan, and their families. Also, Genevieve Jereb, OTR, Gail Heucker, OTR, Alisa Wagner OTR, and Linda Westlin, OTR.

For information on Therapeutic Listening or Vestibular Habilitation workshops contact:
Vital Links (608) 270-5424 or www.vitallinks.net