

Down's Syndrome: Becoming Just One of the Kids **By Paul Madaule¹**

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As recently as four decades ago, children with Down Syndrome were not expected to live until adulthood. Thanks to modern medicine and, above all, to the move away from institutional placement to home rearing, the life expectancy for people with Down Syndrome is almost the same as that for the rest of the population.

The second major result of children being raised at home with loving, attentive families is the uncovering of the hitherto unseen potential of these children who were believed to be severely retarded. Now, the majority of children with Down Syndrome are moderately to mildly retarded with small numbers having severe difficulty and small numbers in the low normal to normal intelligence range.

As we observe new generations of children with Down Syndrome who have had exposure to infant stimulation programs, increasing integration and normalization, new speech and language therapies, and tools such as the computer, many parents and professionals feel we do not yet really know what the true potential of these children is.

Significant Steps in the Right Direction.

Many of the conclusions drawn about the intelligence of Down Syndrome children are in fact unreliable because these children have such poor receptive and expressive language skills. According to Laura Meyers of U.C.L.A. (Meyers, 1986, 1987), children with Down Syndrome have a slow processing which prevents them from hearing short words, especially conjunctions and articles which are critical in the construction of sentences. This leads them to use single or multiple words instead of complete sentences when they express themselves. To compensate for this difficulty, Meyers devised computer programs which help the child to complete the sentences. Once again, the traditionally acknowledged limitations of these children are being challenged.²

We also know that many children with Down Syndrome have poor muscle tone which results in a distinctive posture characterized by a curved back a slouched shoulders. This poor muscle tone also gives some children an expressionless facial mimicry and a tendency to keep their mouths open with their apparently oversized tongues protruding. Speech production, in particular articulation, is adversely affected.

The work of Dr. Alfred Tomatis (Tomatis, 1974) shows that the ear is actively involved in the processing of language and in the auditory control of speech. He has differentiated hearing, which is the passive reception of sound from listening, which is

the active focussing ability of the ear. The middle ear, through the action of its muscles, acts like radar, selectively directing hearing toward the sound of interest as in the case of language sounds we want to perceive. This active involvement of the middle ear is not only the first but also an essential step in auditory processing. For Tomatis, the way listening works is comparable to the ocular function in vision.

The rate and precision of the adaptation of the "auditory radar" is critical in verbal expression. Close observation of the neuro-muscular links between the middle ear and the phonatory apparatus sheds light on these audio-vocal connections. The trigeminal nerve (5th cranial pair) and facial nerve (7th cranial nerve) are both involved in the production of voice and speech. The trigeminal innerves the temporal and masseter muscles instrumental in the closing of the mouth. The facial nerve innerves the digastric muscle involved in the opening of the mouth as well as the muscles of the lips, which are so important in the articulation of speech. Tomatis stresses that the same trigeminal nerve also innerves the hammer muscle (tensor tympani) and the facial nerve innerves the stirrup muscle. These two muscles are located in the middle ear and are in charge of its regulation. Poor muscle tone slows down the movements of the middle ear muscles affecting auditory processing and the auditory control of speech. The resulting inability to produce the shorter words (described by Laura Meyers), prevents proper construction of sentences. Slow auditory processing and auditory control of speech are typically observed in children with listening-related speech, language and learning difficulties (Tallal, 1976).

Poor middle ear regulation may predispose the individual to ear infections. These are commonly experienced by children with Down Syndrome, (chronic otitis media) producing further middle ear dysfunction, which, in turn, impedes listening even more.

Dr. Tomatis has also shown that high frequency sounds send more neural influx to the brain, and thus provide it with energy. In speech, the higher frequency range is concentrated mostly in the timbre of the voice. The poorly articulated voice of many children with Down Syndrome lacks timbre and is, therefore, poor in high frequency content. Not only does this vice provide very little energy to the brain but it also requires a considerable amount of energy to be emitted. The resulting depletion of energy affects not only language expression but also the thinking process as well as body functions such as posture, balance, motricity and co-ordination. It may also affect lateral dominance. Poorly established mixed dominance is a common trait in the Down Syndrome population. In addition, poor posture affects breathing which is so important in speech and general mental alertness. In response to all of the above, a child with Down Syndrome, usually a keen communicator, has every reason to avoid verbal expression as a way to socialize.

Physical and occupational therapists (Heiniger & Randolph, 1981) recognize the vital need for body movement early in the lives of these children. Movement stimulates the brain through the vestibular system of the inner ear and literally "feeds" it with

energy. Poor muscle tone contributes to the tendency of some children with Down Syndrome to be physically passive. For this reason, their need for stimulation through physical contact, exercise and sound is critical.³

Most children generally love music and readily sing and dance - children with Down Syndrome are no different. Sensory stimulation such as music and motor stimulation such as dance should be a part of the education of these children from as young an age as possible. This will "feed" their nervous system with the energy they greatly need. Music is composed of highly structured series of sounds and contains most of the elements, which constitute language - pitch, rhythm and timbre. Listening to music, singing and dancing help the child with Down Syndrome to prepare the sensor-motor neuro-muscular tracks involved in the acquisition of language.

The Tomatis Method applied to Down Syndrome.

Dr. Tomatis has used his method of sound stimulation and counseling to help children and adults with Down Syndrome at his Paris Centre for over 25 years. The Listening Centre in Toronto and other North American centres using the Tomatis Method have been helping these children for the last five years. Results are considered very satisfactory in more than 70% of the cases. (For further information see Gilmore, Madaule & Thompson, 1989).

The following section is an attempt to classify the different levels of intervention of the Tomatis Method when applied in cases of Down Syndrome. This Classification is based on progress most commonly observed and reported during and after the sound stimulation.

1. It provides "high energy" sounds or, as Tomatis calls them, "charging sounds". These sounds come from violin music by Mozart which is modified by filtering out the low and medium frequencies and electronically densifying the higher frequency range. The mother's voice when modified through the same electronic process has a similar beneficial effect with these children.
2. It actually "exercises" the middle ear muscles, increasing their tonicity by using the above described high frequency music through a device called the Electronic Ear. This apparatus is an amplifier with two channels, each of which has its own filter system. The incoming sound is dispatched from one channel to the other through electronic gates. This provokes a repetitive pattern of flexion-relaxation of the ear muscles as any good exercise does. This exercise increases the child's level of vigilance and alertness, making him or her more attuned and more responsive to external stimuli. It also improves muscular control, posture and body image awareness.

One of the most commonly observed effects of the Tomatis Method on people with Down Syndrome is a rapid improvement in the ability to close the mouth, to

keep the tongue in, and to stop drooling. Soon, following these changes, speech articulation becomes clearer and more intelligible. The results are attributed to the neuro-muscular link between the middle ear muscles, the muscles of the jaw and the facial muscles.

3. It helps to establish or reinforce auditory dominance to the right by a progressive decrease in the sound energy level received by the left ear. Increased facial expression is often observed near the beginning of the sound stimulation program. This is followed by a greater ability to construct phrases and sentences. Improved coordination as well as a better sense of time and space are also frequently noticed.

It helps to establish or reinforce the audio-vocal control loop through active vocal exercises with the Electronic Ear. After his listening ability is improved with filtered sounds, the child is asked to repeat songs, words and sentences. The child's voice is picked up by a microphone, processed and modified with the Electronic Ear and fed back via the headphones to his ear. This modified loop makes the child listen to himself the way a "good" ear would hear his voice while singing or speaking. The result is a faster and more precise control of voice production at the level of phonation, articulation, intonation and rhythm. Better audio-vocal control not only makes speech production easier and clearer but also permits more elaborate sentence structure. Consequently, the thinking process is enhanced. Furthermore, the child increasingly enjoys expressing himself verbally and does so with more spontaneity. This helps to improve his relationship with peers and his overall socialization skills.

Counseling.

The Tomatis Method also provides counseling for the families of any child attending The Listening Centres, including those with Down Syndrome. This counseling usually leads parents to a deeper understanding of the hidden and untapped potential of their child and to ways of helping the child make use of it.

Children with Down Syndrome are more like typical children in the community than they are different. Just like other children they have their unique personalities, personal preferences, strengths and needs. Their developmental pattern is identical to that of any other child but may unfold more slowly. While their pace of learning and motor development may be slower, their difficulty with spoken language should not keep us from acknowledging their capacity for learning and thinking. Children with Down Syndrome can generally expect to master basic academic skills such as reading and writing.

Integration and normalization offer children with Down Syndrome the greatest opportunity to develop their potential, especially when this is reinforced by remedial tools and techniques such as speech and language therapies, extra tutoring,

physiotherapy, computers etc. We strongly recommend that parents make use of recreational and cultural programs to develop their children's skills.

Parents must also remember that children with Down Syndrome, like all children, need to like themselves and feel good about who they are. Good self-esteem is critical for good mental health and intellectual development.

The job of a family is to raise its children to independent living. This is no different for families of children with Down Syndrome even though they may make varying amounts of effort to prepare their child for independent living in the community. Children with Down Syndrome need to learn skills ranging from playing with their friends to using public transportation, banking, working, and self-care.

Other Applications.

The Tomatis Method is also recommended for children and adults with poor muscle tone and control due to genetic or neurological causes. It can be particularly helpful for children suffering some forms of cerebral palsy. Better posture, balance, speech and language are most commonly observed. It is often reported by the physical and occupational therapists of these children that they are keener to accept and be actively involved in therapy during and after the listening program. We attribute this change to a better self-acceptance including greater acceptance of their body.

In the light of such results, the frontier which separates these children from being "normal", whatever meaning this word still manages to retain, is yet again challenged.

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REFERENCE NOTES

- ¹ The author wants to thank Louise Bailey for her help in editing this paper. Mrs. Baley is the director of The Baley Progressive School, 272 Codsell Avenue, Downsview, Ontario, M3H 3X2.
- ² See also "Walking Sleeping Souls" by Jerry Adler and Lisa Drew, Newsweek: March 28, 1988. There are unpublished summaries on her investigation available upon request from PEARL Software, 5000 N. Pakwy Calabosas, Suite 105, Calabosas, CA 91302.
- ³ Other work of interest is that of Christine Nelson, Ph.D. and Raquel Behabibi at the Centro de Aprentizaje de Cuernavaca, Rio Balsas 14, Col. Vista Hermoza, Cuernavaca Mor. Mexico 62290.

About the Author

Paul Madaule studied psychology at the Sorbonne in Paris, graduating in 1972. As a young adult, Paul Madaule met Dr. Tomatis who helped him overcome problems related to dyslexia. After working in several European countries and developing listening training programs in South Africa, he moved to Canada in 1978 to open The Listening Centre in Toronto - the first clinical facility of its kind in North America. He then helped other professionals create a dozen Listening Centres in the U.S. and Mexico. As one of the world's leading authorities on listening Paul Madaule spends much of his time lecturing and giving seminars and workshops. He originated "The Listening Experience" workshop and is the author of a book entitled *When Listening Comes Alive* (Moulin, 1993) in addition to numerous articles on the subject. Paul Madaule's work has been a subject of much recent media attention including a major article about the Centre published in *Equinox* magazine (May 1997), a radio interview on the Canadian Broadcasting Corporation (CBC) will also be broadcasting on the U.S. Central Education Network as well as in Europe. The first documentary "The Child You Do Have" deals with The Listening Centre's work with children with autism and the second, "The Key To The World", is about reading problems with adults.