



for hearing impaired children

2011 VOICE Conference  
in Pictures

VOICE Position Paper on  
Listening and Spoken  
Language for Children  
with Hearing Loss

# Sound Matters

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**Auditory Brain Development:  
The Key to Listening, Language,  
and Literacy**

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The VOICE Conference was a smashing success this year with close to 300 delegates in attendance! Dr. Carole Flexer's keynote presentation "Theory of Mind Development in Children with Hearing Loss" was an inspirational reminder that "we hear with the brain ... the ears are just the way in."

Thanks to early identification and advanced hearing technologies, the exposure to more than "in your face" listening opportunities through incidental hearing has enhanced the listening, spoken language and literacy outcomes for children with hearing loss. Dr. Flexer cautioned, that just because a child reaches a level of age-appropriate language does not mean that the "problem" is fixed. It is important to remember that the opportunity to overhear conversations is key to their ongoing development of social skills and vocabulary. Our sincere thanks to ALL the 2011 Conference and Professional Development Workshop presenters, our deepest appreciation to our valued sponsors and exhibitors for your tremendous contribution to this year's Conference, and our gratitude to the VOICE staff and many Conference volunteers who contributed to its outstanding success.

Many members signed up at the conference to offer their support to the VOICE Parent Mentor program, now under the coordination of Anne Cyr. Anne is a bilingual social worker, and herself a parent of a child with hearing loss. Our hope for the VOICE Parent Mentor program is to expand and extend our reach to families with diverse experiences from across Canada. Our multilingual and multicultural mentees have successfully supported families new to Canada for whom English is a second language. Through our database of trained volunteers, we can reach out to all families with children with hearing loss, regardless of whether they live at a distance and share experienced parental guidance.

During May Speech and Hearing Month we are appreciative of the companies who participated in our 2nd annual Dress Loud Day event. Thank you also to all the schools and individuals who "dressed loud" and helped raise public awareness of the needs of children who are deaf or hard of hearing.

We are delighted that the Canadian Paediatric Society has publicly endorsed universal newborn hearing screening in their position statement published on May 9th in *Paediatrics and Child Health*. The

full position paper can be accessed at <http://www.cps.ca/english/statements/CP/cp11-02.htm>.

We are also pleased to be publishing the VOICE Auditory-Verbal Therapy program position statement. You can read more about this initiative in this issue from our Director of Therapy and Training Programs, Anita Bernstein.

VOICE supports the right of parents to choose the communication option for their child. Since the vast majority of parents have no history of hearing loss in their families and want their children to be a part of their listening and hearing communities, they overwhelmingly choose to help their children to successfully learn to speak. Dr. Flexer informed us that the *Oxford Dictionary* publishes 171,476 English language words but that a dictionary of American Sign Language has approximately 5,600 signs. Research shows that a rich vocabulary and oral language are critical to successful literacy outcomes. The VOICE mission remains clear... *to ensure that children with hearing loss have their rights upheld with access to services for developing their abilities to learn to HEAR, LISTEN and SPEAK*. It is imperative that we continue to advocate on behalf of children with hearing loss, their families, and the professionals who support them. Despite all the technological advancements and successful spoken language achievement of children with hearing loss, we cannot be complacent. There have been recent cutbacks in the education and health sectors that are cause for grave concern. In this issue we have published Planning for Success: Supporting Students with Hearing Loss who are Listening and Speaking in the Mainstream Classroom which includes recommended guidelines, based on exemplary models, for appropriate levels of intervention by specialist teachers of the deaf. It is only with the help of our members, volunteers, and supporters, speaking out on behalf of children with hearing loss at the Special Education Advisory Committee tables, in the press, with their elected politicians and with policy makers, that together we can continue to assure that children with hearing loss can Hear, Listen and Speak for life!

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# Sound Matters

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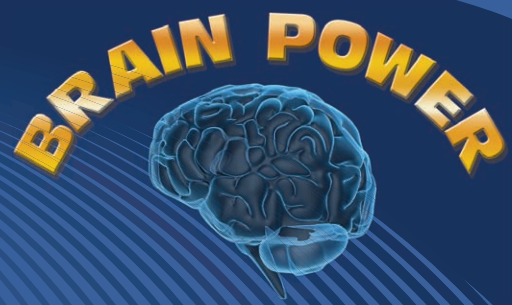
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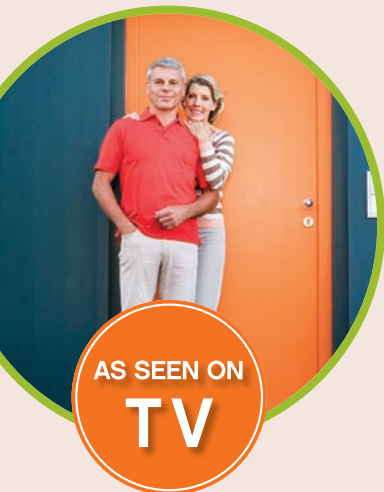
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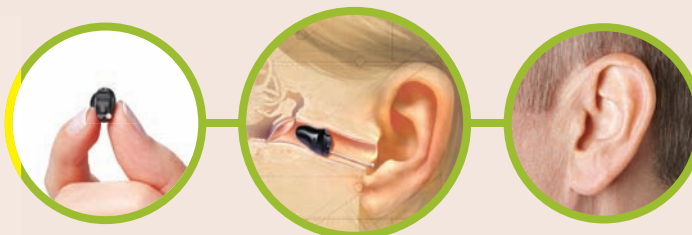
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By Dr. Carol Flexer, PhD, CCC-A; LSLS Cert. AVT  
Distinguished Professor Emeritus, Audiology  
The University of Akron, Akron, Ohio

# Auditory Brain Development: The Key to Listening, Language and Literacy



For hundreds of years, conversations about hearing loss have focused on the ear. Today, the conversation centers on the brain because we hear with the brain; the ears are simply the conduit through which sound travels to access the brain. The challenges posed by hearing loss result primarily from problems in the peripheral auditory system that keep sound from reaching the brain. If sound can be transmitted to the brain in a timely and expeditious fashion, via technology, then the negative consequences of unmanaged hearing loss on speech, language and literacy development can be averted.<sup>1</sup>

Children are unable to listen like adults. Simply stated, when normal hearing adults listen to sounds, the sounds enter an already developed brain with intact language, vocabulary, cognition, and more. In comparison, even children with normal hearing have organic listening limitations in two primary ways. First, the human auditory brain structure is not fully mature until approximately 15 years of age; thus, a child does not bring a complete neurological system to a listening situation.<sup>2</sup> Second, children do not have language and life experience that enables them to “fill-in-the-gaps” of missed or inferred information (called auditory/cognitive closure). Children require more complete and detailed auditory information than adults. Indeed, as compared to normal hearing adults, *all children* need a quieter listening environment and a louder primary signal to create new neural maps and to develop their brains. Children who are hearing impaired need an additional signal-to-noise ratio (SNR) of +10 to +15 dB.<sup>3</sup>

Brain development research shows that sensory stimulation of the auditory centers of the brain is critically important, and indeed influences the actual organization of auditory brain pathways.<sup>2,4,5</sup> The fact is the brain can only organize itself around the stimuli it receives. When complete acoustic events are received, the brain organizes itself accordingly. Conversely, when hearing loss filters speech sounds and prevents these same sounds from reaching auditory centers within the brain, the brain organizes itself differently. Additionally, when the brain centers do not realize full and typical auditory sensations, auditory areas may be re-assigned to visual processing due to neuroplasticity.

“When we want to remember (or learn) something we have heard, we must hear it clearly because memory can be only as clear as its original signal...muddy in, muddy out.”<sup>6</sup>

## Incidental Learning

Incidental learning through “overhearing” occurs when children listen to speech not directly addressed to them – yet they learn from it. Amazingly, babies and very young children learn approximately 90% of the information they acquire incidentally. Of course, incidental learning can occur only if children have access to overhearing conversations that take place at a distance.<sup>7</sup> Unfortunately, without appropriate technology, children with hearing loss (even “minimal” hearing loss) have reduced incidental learning potential because they cannot receive and perceive intelligible speech over distances such as that found in typical classrooms and homes. Reduced distance hearing poses substantial obstacles to classroom (and other) performance because distance hearing is necessary for casual and incidental acquisition of expressive and receptive language. Therefore, for children with hearing loss, their distance hearing ability must be extended as much as possible through hearing access technologies to capture the “free” auditory information that constantly surrounds them.

## Auditory Feedback Loop

The “auditory feedback loop” is the process of self-monitoring and correcting one’s own speech (output). Auditory feedback is of maximal importance for the attainment of auditory goals and to acquire and produce fluent speech.<sup>8</sup> Specifically, children must be able to hear their own speech clearly to produce clear speech sounds. Improving the perceived signal-to-noise ratio of the child’s own speech can boost the salience and accuracy of the speech signal.

## How Much Practice Does it Take to Learn to Listen?

When skills are mastered as close as possible to the time of “intended biological pre-programming,” developmental synchrony occurs.<sup>9</sup> Children are organically receptive to developing specific skills during certain times of development. Further, the brain requires many practice opportunities to develop appropriate, intentional, and accurate neural connections through repeated exposure.<sup>10,11</sup> “Experience dependent plasticity” is a critical concept, meaning repeated auditory stimulation leads to stronger neural connections.<sup>12</sup>

The amount of practice required to continually wire and re-wire the brain for higher order language skills and the acquisition of knowledge is enormous. Gladwell,<sup>13</sup> Levitin<sup>14</sup> and others report 10,000 hours of

practice is needed to become an expert in a particular skill. Hart and Risley reported by the age of 4 years, typical children need to have heard 46 million words to be ready for school.<sup>15</sup> Dehaene reported 20,000 hours of listening are necessary in infancy and early childhood as a basis for reading.<sup>16</sup>

## Summary

To conclude, current research confirms several facts for families who desire a spoken language outcome for today's infant or toddler who experiences hearing loss. Families need to know that very early use of hearing aids or insertion of a cochlear implant for severe to profound degrees of hearing loss to access, stimulate, and grow auditory centers of the brain during times of critical neuroplasticity – followed by thoughtful, intense, and ongoing auditory exposure and enrichment activities to take advantage of developmental synchrony and cumulative practice – offer a high probability of reaching their desired outcome of age-appropriate spoken language and literacy skills.

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# Planning for Success: Supporting Students with Hearing Loss who are Listening and Speaking in the Mainstream Classroom

Over the past two decades, the education of students who are deaf and hard of hearing has seen tremendous changes due largely to improved technology in hearing aids, cochlear implants as well as FM system, giving the majority of children access to sound through which they then can acquire spoken language. As a result, greater numbers of children are able to attend schools within their communities alongside their peers who have typical hearing.

Inclusive education and inclusive schools promote the participation of all students by creating opportunities for children and parents to be actively involved in all aspects of the school with expert guidance and support from well-qualified professionals. Schools are auditory-verbal (AV) environments, where students listen for periods of time and then interact verbally with teachers and peers (Olmstead et al. 2011).

Brophy et al, (2006) identified key facilitators for successful inclusion of deaf and hard of hearing students into schools. Itinerant teachers of the deaf and hard of hearing, classroom teachers, students, parents and administrators who work collaboratively ensure that a positive and productive approach is employed throughout the school years for each student.

Although technology and early intervention services have seen major development and improvements, students who have a hearing loss continue to experience many challenges in the fast paced, noisy classroom environment. Many children who are deaf or hard of hearing are now entering kindergarten speaking with ease. This accomplishment, largely due to newborn screening, early intervention and advances in hearing technology, does not ensure academic success. Support services must be in place to assist the student to transition from the sheltered, quiet home environment to the busy and noisier demands of a classroom. Audition is a foundation skill upon which auditory memory, auditory processing, speech articulation, language, literacy, and academic skills are built. To ensure success and full inclusion in the mainstream school, the student with a hearing loss requires the support of a teacher of the deaf who is a listening and spoken language specialist.

Although the amount of support a student requires to ensure success in school varies depending on a particular child's needs; some degree of support must be provided throughout the student's time in the school program.

## Factors that Affect a Child's Performance in School

1. Auditory skills and verbal ability
2. Reading and math readiness skills
3. Learning style: behaviour, attention span, etc.
4. Use of assistive listening devices (FM systems)
5. Availability of learning support services – Itinerant Listening and Language Specialists (Cert AVTs or Cert AVEs), Teachers of the Deaf and Hard of Hearing, Speech-Language Pathologists, Teaching Assistants, Educational Audiologists, Special Education Teachers, Psychologists, Social Workers, Occupational and Physical Therapists, etc.

## How Much Service Does a Student Require?

Teachers of the deaf and hard of hearing are best equipped to oversee the process of inclusion for students with a hearing loss. The level of service to all students is based on needs and is supported by the documentation of tests and observations, consultation and discussion with the classroom teacher and school personnel.

Some students may require a great deal of support in the early years but that need may lessen later on; whereas some students in the senior years of school may benefit from an increase in service due to the academic demands of the high school years.

Needs must be evidenced based and measurable. The amount of intervention must be based on results of standardized tests which address the student's needs, to ensure access to the curriculum. Changes to the amount of service by an itinerant teacher of the deaf would be based on the measurable progress observed over the school year.

The teacher of the deaf performs standardized diagnostic assessments in order to determine levels of performance in the areas of audition, speech, vocabulary, language, and academic skills. Goals based on informal and formal assessments are set and developed following the expected developmental patterns of children who can hear. Additionally, the itinerant teacher of the deaf routinely checks hearing aids, cochlear implants, and FM systems to ensure the devices are in optimal working order. Critical to the role of the itinerant is the ongoing guidance and coaching provided to the student's parents, classroom teachers, and teaching assistants. In using an approach that is diagnostic and developmental, the itinerant guides the team towards a positive and

# Planning for Success: Supporting Students with Hearing Loss who are Listening and Speaking in the Mainstream Classroom

successful experience for the professionals and specifically for the students and their families.

## Transitioning to the Community School

A variety of services for students who are deaf or hard of hearing exist across Canada, within the same province and even between different school boards within the same city.

### Proposed Supports to Ensure Success for the Student with Hearing Loss

1. Support services based on needs not on level of hearing loss
2. Needs assessment based on information gathered in collaboration with the team of professionals supporting the student with hearing loss – evidence from standardized test as well as informal assessment in the areas of audition, speech, language, literacy, cognition, and academics
3. Evidence-based goals with measurable progress, supported by documented tests, observations and discussions with school team and parents
4. Standardized diagnostic assessments to determine levels of performance in audition, speech, vocabulary, language, and academic skills
5. Team of professionals which would include classroom teacher, teacher of the deaf and hard of hearing, professionals with specialization in listening and spoken language development (certified A-V educators), educational audiologist to provide technological supports, learning resource, and other professionals as required

## Frequency of Service – Suggested Protocol

### Four to Five Times Weekly – One or More of the Following

- Vocabulary and other language scores more than two to three years behind those of normally-hearing children of same age
- Significant academic issues
- Student is a new Canadian and has no spoken English skills

- Child is newly implanted

### Three Times Weekly – One or More of the Following

- Vocabulary and other language scores up to but not more than two years behind those of normally-hearing children of same age
- Academic concerns
- Needy kindergarten student

### Twice weekly – One or More of the Following

- Communicating well, but requires support
- Transitioning to school from early intervention program
- Speech, listening or spoken language concerns, as well as some written language or academic issues

### Weekly:

- Typically doing well – age-appropriate listening, speech and language
- May require active monitoring for: academic support; social skills; or equipment issues

### Equipment Monitoring:

- Clearly demonstrated performance in all areas typical of normally-hearing classmates

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## Auditory-Verbal Mentoring – Cultivating a Change in Professional Perspective



As a speech-language pathologist with six years of practice under my belt I enrolled in my first auditory-verbal course at York University in 1999. Anita Bernstein, the instructor, came offering a wealth of experience and the same enthusiasm for teaching the group of students in 1999 as for her current mentees in 2011. This is a testament to her commitment to the practice of auditory-verbal therapy and the longevity of the approach as she has continued to mentor countless

speech-language pathologists and teachers of the deaf over the years.

Traditionally, graduate programs in speech-language pathology are intensive and cover a broad range of speech and language delays and disorders from birth to geriatric. The training has a strong base in the knowledge of brain and physiological structures associated with hearing, speech and language functions from language acquisition to language loss due to syndrome, trauma or age-related deterioration. Identification of delays and disorders and introduction to therapy approaches to remediate disorders is the primary focus. Best practice is evidence based with research guiding clinical decisions. Courses in counselling are provided but practical application of these skills develops through practice. It is through practice of auditory-verbal therapy and the mentoring process that I have grown and continue to grow in the inclusion of parents in the therapy sessions, goal setting, and advocacy.

There are so many facets to the auditory-verbal approach from ensuring the child's hearing technology is providing the best access to sound, to developing methods for evaluating listening, language, speech and cognition in infants, toddlers, and preschoolers, to developing creative approaches to therapy to maintain the attention of young learners, to coaching and supporting parents as they continue the therapy at home, to team building with schools, audiologists, and other professionals who work with the child. Having a mentor to provide feedback and guidance is invaluable. Over the years Anita has provided me with knowledge and support in each of these areas.

Prior to the implementation of the Infant Hearing Program in 2002, there were small pockets of A-V practice across Ontario with VOICE as an ardent supporter of services for families. Parents sought out the service and early identification was not the norm. Word of mouth was often the means by which parents came to know about auditory-verbal therapy and the services were frequently delivered through private practitioners or enlightened speech-language pathologists or teachers of the deaf. Ministerial funding of the Infant Hearing Program has provided the opportunity to educate and support both parents and therapists in the auditory-verbal approach. I am truly thankful for the opportunities I have had to develop these skills under the guidance of the VOICE mentoring program and for the continued opportunities to work with families, children and professionals in achieving the best outcomes in listening and spoken language for children with hearing loss.



By Babette Bailey, OCT,  
Itinerant Program Resource Teacher – Deaf/Hard of Hearing  
Niagara Catholic District School Board

## My Experience Participating in the VOICE, Listening and Spoken Language Specialist – Auditory-Verbal Educator Mentorship Program (LSLS Cert AVEd)



I began sessions with the VOICE Director of Therapy and Training Programs, Anita Bernstein, a little over a year ago and I will be continuing with Anita's mentoring support through the 2011 – 12 school year as well. The Niagara Catholic District School Board administration, teachers, and parents have been tremendously supportive and helpful in my trek toward gaining LSLS A-V educator certification. Anita keeps me on track in developing the skills and knowledge I need in reaching this goal.

An auditory-verbal educator is a specialist who; teaches children with hearing loss to listen and talk exclusively through listening and spoken language, integrates the foundation skills of listening, speech and cognition with the school curriculum goals and engages parents as active partners in their child's program.

In order to meet the standards of the above description I need to be ever mindful of the principles of auditory-verbal practice. Each of the principles directs professionals and parents to doing everything possible to support the listening and spoken language development of the children they support. As a teacher of the deaf starting out as an A-V educator mentee I was somewhat

confident that to some degree I was already doing these things. Well, let me tell you, at the time, I don't think I knew what some of the principles really meant. There are differences in the way I do things now as opposed to two years ago. Many of the differences are subtle and some are not, but those differences no matter how subtle or significant, add up to huge gains in developing listening and spoken language. The changes are spread out over every aspect of my job and duties as teacher of the deaf. Here are a few examples.

When I first began with Anita she pointed out to me something that I wasn't even aware that I did. I tended to always present auditory messages with a visual up front. I spoke clearly but I always had a picture, pointed to text, or held up some type of cue as I spoke. I needed to work on my auditory-verbal techniques. When I spoke to my students I had to consciously hold back that visual cue, wait, let the student hear the message and then only if it was necessary I could bring out the visual but then I needed to remember to restate my message orally bringing it back to audition. I have to say; time and time again my students showed me that they did not need the visual. And I'm happy to report that this technique is a part of me now and I see growth in each of my student's ability to listen.

Another change that took place over the year was the learning expectations in the lessons I planned with my students. I work directly, two to three times a week with each of the students, mainly withdrawal. Many of the students I work with struggle with reading and somehow over the years I had become the one to work on reading skills with my students. It started off where I had agreed to add just a few minutes of our session time together practicing reading. Well before I knew it much of the session was spent on reading skills, strategies, or sight word drills. I would manage to get some definitions in, or word attack skills, or

### Principles of LSLS Auditory-Verbal Education

(AG Bell Academy for Listening and Spoken Language)

1. Promote early diagnosis of hearing loss in infants, toddlers and young children, followed by immediate audiologic assessment and use of appropriate state of the art technology to ensure maximum benefits of auditory stimulation.
2. Promote immediate audiologic management and development of listening and spoken language for children as their primary mode of communication.
3. Create and maintain acoustically controlled environments that support listening and talking for the acquisition of spoken language throughout the child's daily activities.
4. Guide and coach parents to become effective facilitators of their child's listening and spoken language development in all aspects of the child's life.
5. Provide effective teaching with families and children in settings such as homes, classrooms, therapy rooms, hospitals or clinics.
6. Provide focused and individualized instruction to the

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## My Experience Participating in the VOICE, Listening and Spoken Language Specialist – Auditory-Verbal Educator Mentorship Program (LSLS Cert AVEd)

pull in some phonemic awareness tasks but I needed to get working on those foundation skills of listening, speech and cognition and entrench them in the school curriculum goals. The expectations and strategies in my lesson plans are now what they should be. The language I use in my lesson plans is different; words like auditory self-monitoring, auditory association, auditory memory, auditory sequencing, and auditory comprehension. Hierarchies swim in my head when I'm writing my lesson plans. I now provide focused instruction while maximizing listening and spoken language!

Although each session with a student is evaluated and diagnostic information is collected, the auditory-verbal educator training program has opened the door for me in the area of using formal assessments with my students. This means that at the end of the school year I am able to take a close look at the effectiveness of the previous year's program, monitor the progress of each of my students and confidently develop individualized language program goals.

Another big difference is that parents join the session with their child at the school. When a parent attends sessions regularly it's powerful; it accelerates their child's speech and language development. Parent coaching/guiding goals are written into my lesson plans and parents follow through with that goal until we meet again. For some of my students, both of the parents work so they are unable to attend. Telephone or e-mail is then used to communicate goals to the parent. As well the teacher and educational assistant take on the goal for the week and report the outcome during my next visit.

I am truly grateful for VOICE in offering the training and mentoring program. The impact on the students and families is very positive. Students are making progress and I am able to effectively support teachers and parents in facilitating language development.

It has been a year of constant learning and growing and there is still more yet to come!

child through lesson plans and classroom activities while maximizing listening and spoken language.

7. Collaborate with parents and professionals to develop goals, objectives and strategies for achieving the natural developmental patterns of audition, speech, language, cognition, and communication.
8. Promote each child's ability to self-monitor spoken language through listening.
9. Use diagnostic assessments to develop individualized objectives, to monitor progress and to evaluate the effectiveness of the teaching activities.
10. Promote education in regular classrooms with peers who have typical hearing, as early as possible, when the child has the skills to do so successfully.

### Auditory-Verbal Techniques (Estabrooks & Marlowe)

Acoustic highlighting  
Auditory closure  
Rewording  
Asking ... What did you hear?  
Providing alternatives  
Pausing  
Repeating  
Repetition of previous strategy  
Waiting  
Rephrasing  
Labelling by category  
Asking for or providing a definition  
Changing the task from open set to closed set  
Providing rhyming words  
Suggesting opposites  
Providing a visual clue and putting the stimulus back into hearing  
Moving closer to the child  
Directing the child to listen closely  
Repeating part of the story message containing the answer



SAVE the DATE for VOICE CONFERENCE  
MAY 5, 2012

THANK YOU TO  
ALL THE 2011  
VOICE DRESS LOUD  
DAY PARTICIPANTS

Jonah's principal organized École St. Norbert Immersion's "Dress Loud Day" to raise awareness that deaf and hard of hearing kids can learn to speak and listen. Jonah wore a wacky combination of colours and we wrote "Be Loud" on his forehead, although I have to admit I was tempted to write "Keep it Down." Submitted by Rae Gagnon of Winnipeg.





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You should talk to your physician about who is a candidate for cochlear implantation, the associated risks and benefits, and CDC recommendations for vaccination. Cochlear implantation is a surgical procedure, and carries with it the risks typical for surgery. For additional information please refer to the Nucleus Package Insert (available at [www.CochlearAmericas.com/NucleusIndications](http://www.CochlearAmericas.com/NucleusIndications)).

Not everyone with hearing loss is a candidate for a Baha. All surgical procedures include an element of risk, and it is impossible to guarantee success. For complete information regarding the risks and benefits of a Baha procedure, please refer to the Instructions for use for the Baha implant (available at [www.CochlearAmericas.com/BahaIndications](http://www.CochlearAmericas.com/BahaIndications)).

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## Do You Hear What I Hear?

### Speech Perception and Story Comprehension in Children with and without Hearing Impairments



Caitlin Farrar and Abbey Massar.

The research conducted by Caitlin Farrar and Abbey Massar was completed to fulfill requirements of their honours theses projects in the department of Applied Linguistics at Brock University. This research was supervised by Dr. Lynn Dempsey and Dr. Barbra Zupan. Caitlin Farrar will graduate with an honours degree in Speech and Language Sciences from Brock in June 2011 and will be attending Western University in September 2011 to begin her master's degree in speech language pathology. Abbey Massar graduated with her honours degree in speech and language sciences in June 2010. Abbey is currently focused on gaining additional research and clinical experience before pursuing graduate work in speech-language pathology.

Preschool aged children are surrounded by language in the classroom, at home, and in the community. Narratives make up a large part of this exposure: story time at school, telling someone about their day, listening to the radio in the car, and overhearing other people's conversations are all examples of narrative-based language children are constantly exposed to.

For children, understanding narratives requires a diverse set of skills. They must be able to integrate their knowledge of the world while

understanding sequences of events, making use of their vocabulary and comprehending cause-and-effect relationships. In addition, when children are presented with narratives orally, accurate speech perception is critical to their comprehension. In order to fully process what a speaker is saying, a child must integrate what he hears with what he sees. This is especially important when a child does not get complete information from the auditory signal. When listening to oral narratives, children with hearing impairments must be able to process auditory information very quickly which is a skill that can be quite challenging. If a child who is being told a story mishears information, he may have difficulty understanding what's going on. Think of the common children's story *Goldilocks and the Three Bears*. What if you frequently misheard the "b" sound as a "p"? All of a sudden, you're hearing about *Goldilocks and the Three Pears*, and right from the start, things don't make sense.

Even when provided with assistive listening devices to help overcome these types of obstacles, children with hearing impairments may still miss some auditory information when being told a story. This is what we wanted to investigate: do the speech perception abilities of children with hearing impairments impact their ability to understand stories?

In our study, we compared two groups of 3-to-6-year-old children: 7 children without hearing loss, and 9 children with moderate-to-profound hearing loss, using either hearing aids or cochlear implants. We assessed their speech perception skills using a computer-based task in which they were shown a person speaking and asked what they heard. Sometimes the person's lip movements matched the sound the speaker was saying, and sometimes the sound and the lip movements did not match.

To assess narrative comprehension, we read children three versions of a story. The first version was the complete story read at a typical pace, the second version was missing information that the child was prompted to fill in, and the third version contained incorrect information that the child was asked to identify. We also examined receptive language skills, speech production ability using standardized tests, and completed a thorough literacy profile. For children with hearing impairments, a detailed hearing history was obtained.

After comparing the results, we discovered that speech perception abilities differed between the two groups. As a whole, the children

with hearing impairments did not have a preference for the information they used (auditory versus visual) to interpret the speech heard. In other words, they reported the sound they heard and the sound they saw an equal number of times. This means that the children with hearing loss were using whatever information was available and least ambiguous in the moment, regardless in the modality it was presented in. This was in contrast to the children without hearing impairments, who most commonly identified the auditory information as the sound they had heard. Results of the narrative tasks revealed that children with hearing impairments understood the stories just as well as the children with no hearing loss, and their preferred method of speech perception did not impact their ability to understand the stories.

There are two factors that we think contributed heavily to this positive result. First, all of the children with hearing loss had appropriate access to sound through their hearing technology and were enrolled

in auditory or auditory-verbal therapy. Although they did not rely as much on the auditory signal during the speech perception task, they were still able to use the auditory information during oral narratives similarly to children without hearing loss. Second, all of the children were routinely exposed to literacy activities. Every child was read to at least once a day by their parents in addition to regular preschool literacy exposure, positively impacting narrative comprehension development.

Although we only tested 16 children, the overall findings are very exciting! In order to confirm these results, we acknowledge that further research is needed, especially with a larger population. However, what we found indicates that with frequent literacy experience, a devoted support system and effective therapy intervention, children with a hearing impairment are able to compensate for their loss and make use of auditory information to excel in areas of receptive language.

feature

By Ainsley Latour

## Been there ... Done that ... Transitioning to College or University



Thank you to the 2011 Teen Workshop Coordinator Ainsley Latour! Ainsley is a 4th year teacher of the deaf who also has a hearing loss. She has shared some thoughts for teens on taking the big post-secondary step.

With today's hearing technology, achieving successful post-secondary outcomes is a realistic goal for many parents and their students with hearing loss. With effective planning, action and advocacy, and of course, hard work, you will obtain a diploma or degree.

For the student with hearing loss, parents devote enormous amounts of energy into meeting transition points leading up to higher education. Diligent parents facilitate a child's language skill development early in their life. They typically advocate for their child's needs at school entry, as they progress through elementary school, and in post-secondary transition planning. The student is expected to participate in the Individual Education Plan and Transition Plan upon the age of 14 and is expected to participate in considering their options for post-secondary and the plans that need to be in place to facilitate a smooth transition.

To begin planning for life after high school, it is important to understand the differences between post-secondary schools and high schools with regards to how disability issues are handled. College and university students have the right to be accommodated in the schools,



but the extent or degree of the services offered will vary from school to school.

As students enter post-secondary, it is the responsibility of the student to make the appropriate offices or staff aware of their hearing loss and any other needs. The young adult student is responsible for making sure they request and receive the accommodations they need to achieve academic success.

They need to be good self advocates. They need to be self-confident, be socially appropriate and possess sound knowledge of their assistive listening devices (including personal FM systems, alerting devices, hearing aids, and audiograms). They should possess a thorough understanding of the implications of their hearing loss in a variety of learning environments.

Students and parents will find it helpful to talk to others who have successfully transitioned to work and post-secondary school. VOICE can help.

Here are some tips on transitioning to college, university and/or work with a hearing loss

1. When you are applying for jobs, most people do not identify themselves as an individual with a hearing loss on their resume. It is advisable to wait until you are offered an interview to disclose any information regarding your hearing status.
2. Contact the Office for Persons with Disabilities at the post-secondary institution to find out about their registration process. You will need to register both with the university (i.e., register for classes) AND the Office for Persons with Disabilities. You may wish to visit this office during a campus tour early in your application process to establish contact with the appropriate staff and investigate the supports that are available.
3. Familiarize yourself with the terminology and impact of hearing loss across a variety of communication settings. You will need to explain your hearing loss and the impact of your hearing loss on communication to someone unfamiliar with the needs of students who are deaf or hard of hearing. This may be something your itinerant teacher can support you with before you graduate from high school or refer to the VOICE Transition Guide.
4. Be familiar with the different kinds of assistive listening devices, hearing aid and/or cochlear implant features. Knowing the specific features and options of various systems will help you to choose the right technology and determine any accessory components you may wish to order. If you have funding for an FM, you may wish to include things like extra batteries (the FM draws additional power from your implant or hearing aid battery), clips, etc. Your itinerant teacher may be a good initial resource, but you will have to take personal responsibility for your equipment upon entering post-secondary.
5. Be familiar with provincial funding programs for assistive listening devices, such as ADP (Assistive Devices Program) in Ontario. Each Canadian Province has a different program with varying degrees of support.
6. If you are an Ontario resident you should apply for OSAP. Even if you are ineligible for this support, applying may assure eligibility for funds set aside for students with special needs. You might want to ask staff in the Office for Persons with Disabilities about potential funding sources, including the necessity to apply for OSAP. Check out the VOICE Scholarship Directory at [www.voicefordeafkids.com](http://www.voicefordeafkids.com)
8. Have a current audiogram completed. Contact the special needs office at the College/University to see what other documentation they require if you have additional exceptionalities.

More resources for students transitioning are available from the Canadian Hard of Hearing Association (<http://chha.ca/chha/scholarships-chha.php>) (<http://chha.ca/chha/publications-youth.php>)

**Hearing the Learning: Post secondary education handbook for students who are hard of hearing (Y-3)**

**Price: \$8.00**

This guidebook for students is designed to provide students with information, tips and strategies to enhance their success in a post-secondary environment.

**Towards the Future - SOUNDINGS: Strategies for hard of hearing post-secondary students (Y-6)**

**Price: \$10.00**

Soundings will help post-secondary students with hearing loss recognize their strengths and the roadblocks which they can also expect to encounter on their way to an education. They will see how much they share in common with our focus group of students who have hearing loss and are currently in the education system or on their way to a working career. By reading their dialogue with each other, it is our hope that students, who are hard of hearing, will find some strategy to make their education a touch more manageable.



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By Lisa Katz, MHSc, SLP(C), Reg. CASLPO, LSLS Cet AVT; and  
 Maria Emilia de Melo, MFga, SLP, Aud(C), Reg. CASLPO, LSLS Cet AVT  
 Infant Hearing Program, Toronto Public Health

# Toronto Infant Hearing Program and Auditory-Verbal Therapy: What Do We Do When the Therapist and Family Speak Different Languages?

Toronto is a city which is home to a multitude of cultural groups and where more than 100 languages and dialects are spoken. In the Greater Toronto Area, more than 50% of the population was not born in Canada. Rich ethnic diversity, religion, and lifestyle help define and set Toronto apart from other world cities.

Auditory-Verbal Therapy (AVT) is a family-centred approach which caters to the individual needs of the family and child. In keeping with this, the therapist must strive to refine and tailor the service to meet the specific needs of the family. When providing AVT to families of different cultural and/or linguistic backgrounds, there are a number of factors that a therapist should consider.

Language barriers may lead to difficulty understanding therapy goals, techniques and strategies and other explanations the therapist provides. Parents may find it challenging to follow through with guidance and carryover activities provided by the therapist. In addition, parents who don't speak the language of the community may have difficulty advocating for their child.

Aspects such as scheduling and attendance in therapy may also be impacted by cultural differences. Some mothers, for example, require a male escort at every therapy session and the therapist might need to make special arrangements to manage this. Other examples may include specific accommodations that need to be made for religious customs and holidays.

Another factor to consider is the selection of therapy toys and materials. Some Learning to Listen (LtL) toys, specifically certain animals, may have a cultural or religious significance. It is important that the therapist is aware of this.

Parents of different cultural backgrounds may have different expectations for their child's behaviour and overall development. In certain cultures, for example, it is acceptable for infantile behaviours to persist into childhood. This may include being bottle fed, as the primary source of nutrition, for the first three years of life, and sleeping

in the parents' bed until puberty. These habits may encourage parents to see their children as younger than they really are, diminishing the expectation that they can learn to listen and talk when it is developmentally appropriate to do so.

Members of some cultures view individuals with impairment as inferior, incapable, and disabled. Some families may hide their child's hearing loss from relatives and friends. They may delay seeking services and resist "buying into" the therapy process. Some parents may not put the hearing technology on their child when they are out in public. This ultimately affects the child's self esteem and compromises his/her overall potential. It is advised that the therapist take it upon him/herself to inquire about a family's culture and also do some independent research. This will result in the ability to provide a considerably more effective service.

Working with families of different cultural and/or linguistic backgrounds can be an overall enriching experience which ultimately heightens the therapist's awareness and sensitivity to differences. The knowledge and information gained from these experiences provide valuable information to help the professional in his/ her work with other families.

## Multilingualism Myths

In the past, parents of children newly diagnosed as deaf or hard of hearing were told that their child would not be able to learn spoken language, sing, or learn multiple oral languages. With the use of current hearing technology, many children with all levels of hearing loss are able to learn more than one language in a manner similar to their hearing peers.

Concerns about learning a second language were related to the belief that learning that language would interfere with mastering the primary language and could precipitate language impairment. Research has shown that this is not true.

It is now known that children worldwide are able to learn more than

## Toronto Infant Hearing Program and Auditory-Verbal Therapy: What Do We Do When the Therapist and Family Speak Different Languages?

one spoken language without developing speech or language problems. Bilingual children develop language skills in the same manner as other children do. Instructing a parent or caregiver to speak English, if he/she is not fluent in the language, limits parental input. It also does not provide for optimal language learning in the child's natural environment. Research has shown that when non-fluent English-speaking parents speak English with their children, they use less vocabulary and engage their children in less language discourse than a native English speaker.

### Multilingualism Facts

Every bilingual child is unique. Developing skills in two languages depends on several factors including the quality and amount of exposure in both languages. It is not uncommon for children to occasionally mix grammar rules or use words from both languages in the same sentence. This is a normal part of bilingual language development.

When a second language is introduced, some children may not talk much for a while. This "silent period" can sometimes last several months.

Again, this is normal and will typically go away. If, however, a child appears to have problems in both languages, it is important to seek professional help.

### Parent Guidance

Review of the literature suggests a variety of strategies which parents may use to teach their children to learn more than one language. Among them are advising one parent to speak one language and the other parent to speak the second language. Another strategy is for both parents to speak one language in the home and the child learns a second language at school. Finally, one language can be used in the home and at school and the second language in the community. It is important to evaluate the practicality of using these strategies on a case-by-case basis. No matter which strategy is chosen, parents and caregivers should give their children multiple opportunities to listen to and use the languages in everyday situations.

In promoting an optimal way for children to learn more than one language, it is recommended that parents do the following things:

- Ensure that there are opportunities for vocabulary development in everyday life.
- Create equal and relevant situations for all children to develop the languages.
- Avoid abrupt changes in language use.
- Do not force multilingualism. Make it a natural part of family life.
- Be consistent with the pattern chosen; for example, one parent speaks one language, the other parent speaks the second language.
- Avoid mixing languages.
- Be aware of individual differences among their children.
- Speak the language that is most comfortable for them.
- Keep the grammar of each language suitable for the child's age.
- Keep the child interested and motivated. Parents should help their child feel proud of his/her language and culture. If the child is learning more than one language, teach him/her the names of the languages.
- Participate in community programs. In addition to socializing with children who speak the language of the community, parents should encourage their children to play with peers who speak the same language as them. Parents should also talk to their children about what they did at playgroup or nursery school in their language.

### Initial Appointment

In the Toronto Infant Hearing Program, wherever possible, we try to match families with a therapist who speaks the same language as the family. When calling a family who does not speak English to book an initial appointment we use Language Lines, a telephone interpretation service.

In our face-to-face meetings and in every therapy session, we use interpreters which are funded by our program. These professionals interpret the entire conversation as well as the therapist's explanation of the policies and procedures, consent forms, and other relevant information.



At the initial meeting, we routinely ask families to share any relevant information about their culture and language. We also provide a package of information to all families. If we know that a family speaks a different language, we provide materials in that language where available. Toronto Public Health has materials and resources in multiple languages.

## Assessment

As part of our diagnostic AVT sessions, we routinely conduct both informal and standardized assessments, report outcomes and when necessary and available, we partner with a speech-language pathologist who speaks the same language as the family.

Having an interpreter present at every therapy session supports our ability to effectively conduct informal assessments. The professional interprets information provided by parent report; for example, information about the child's everyday progress, and answers to parent questionnaires and checklists.

The interpreters also help us to understand the child's productions during the sessions. For example, it can be difficult to know whether a word is in fact an actual Mandarin word, a word approximation, or just jargon or babble. It is not uncommon for parents to report what the child should have said rather than what he/she actually said. This is true for English speaking parents as well. For example, the parent may report that the child said "I want more water," when he/she actually said "More." If we don't know the meaning of the child's utterance and whether or not it is grammatically appropriate, the interpreter helps us decipher this.

When conducting formal assessments, the therapist must consider that the use of tests and tools which are normed on children who speak English cannot be used on children who speak other languages in a standardized way. In cases where the test items are translated into the child's primary language, the results, which often provide valuable information, can only be used in an informal or criterion-referenced fashion. The initial items on Preschool Language Scale – 4 (PLS – 4), for example, lend themselves quite well to being translated. Items later on do not. This is because the higher level items involve the understanding or use of specific grammatical morphemes which may not exist in the child's language. If the therapist uses a test like the PLS – 4 to assess a child in English, if it is not his/her primary language, then the results will likely underestimate the child's actual language level as well as his/her auditory-verbal potential.

## Partnering with Interpreters

When partnering with interpreters there are a number of factors one should consider. The first is the consistency of the professional. If the therapist has built up a good rapport with the interpreter it is preferable to use the same person for every session. The interpreter becomes familiar with the child and the family as well as the session routine and terminology. Equally as important, the child and the family become familiar with the professional. Another consideration is gender preference. Some families may prefer a female rather than a male interpreter, typically for religious reasons. Interpreters need to

be informed that their translation needs to be as close to the original utterance as possible. For example, if the therapist says, "Find something that you wear on your head" and the interpreter says "Get the hat," then the target for the task has changed. In addition, when providing parent guidance where there is a lot of information to convey, the therapist and parent should avoid the use of continuous dialogue and long sentences. Finally, one person should speak at a time. This will prevent the message from being misinterpreted.

## Therapy Sessions and Case Conferences

When planning a therapy session or organizing a case conference in which an interpreter is present, the therapist must consider that more time will be required to deliver the same amount of content compared with a typical session. The therapist also needs to be aware of grammatical differences among languages. For example in Mandarin there are no plural markers. This information can be provided by the interpreter. Ltl sounds can be adapted to reflect the fact that different languages may have different onomatopoeic sounds. At the same time, one needs to keep in mind the rationale behind the use of the Ltl sounds. It is important to ensure that the full range of speech sounds is represented. Partnering with the interpreter also involves familiarizing him/her with terminology used in the session, for example, cochlear implants and auditory-verbal therapy.

## Additional Supports and Services

Toronto Public Health can provide families with access to a range of helpful supports and services where the family's first language can be used. Among them are public health nurses, family home visitors, and parent-to-parent mentors. Besides speaking the same language as the family, these professionals may share the same cultural background. These professionals may be better able to address some of the culturally specific behaviours mentioned previously, for example sleeping and eating habits. This support will ultimately help the child achieve his/her optimal auditory-verbal potential.

Editor's Note: The VOICE Parent Mentoring Program offers multilingual and multicultural support to families from across Canada.

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## Provinces and Territories Urged to Screen All Newborns for Hearing Loss

All provinces and territories should provide universal newborn hearing screening (UNHS), says the Canadian Paediatric Society in a position statement published May 9 in *Paediatrics & Child Health*.

“Neonatal hearing loss is one of the most common congenital conditions,” said Dr. Hema Patel, author of the CPS position statement. “When we diagnosis a hearing impairment early, it has a significant lifelong effect on the neurological development and learning potential of the child.”

Up to 3 in 1,000 babies are born profoundly deaf. Another 3 in 1,000 have serious hearing loss. Most hearing-impaired children are healthy and born to hearing parents.

“The ability to accurately detect hearing loss in newborns and to re-establish hearing is one of the major advances in paediatrics in the last 20 years,” said Dr. Patel. “It’s not surprising that most developed nations have well established infant hearing screening programs.”

While several jurisdictions have universal newborn hearing screening, many parts of Canada do not.

When newborns are tested, a diagnosis is usually at 3 months or earlier, with intervention by 6 months. Children with hearing impairment who have early intervention can be expected to develop to their full potential. In unscreened children the average age at diagnosis is 24 months old.

Diagnosing hearing loss as early as possible also appears to be cost-effective. A recent Quebec report suggested that a province-wide screening program would result in a net savings of \$1.7 million, largely through savings in education and training.

The Canadian Paediatric Society is a national advocacy association that promotes the health needs of children and youth. Founded in 1922, the CPS represents nearly 3,000 paediatricians, paediatric subspecialists and other child health professionals across Canada.



## VOICE for Hearing-Impaired Children Launches a Position Paper on Listening and Spoken Language for Children with Hearing Loss

The Auditory-Verbal (A-V) programs offered by VOICE, which include direct therapy services to families as well as A-V mentoring and training to professionals, are consistent with the VOICE Mission "To ensure that all children with hearing loss have their rights upheld with access to services for developing their abilities to learn to HEAR, LISTEN and SPEAK."

The following are the principles which guide the VOICE A-V program offerings. Please refer to the VOICE website ([www.voicefordeafkids.com](http://www.voicefordeafkids.com)) for the complete position paper including research which supports VOICE's position on the listening and spoken language communication option for children with hearing loss.

**VOICE for Hearing-Impaired Children supports listening and spoken language development for children identified with permanent hearing loss.** A-V intervention is a diagnostic approach that provides maximal auditory stimulation to develop the child's auditory pathways during the critical learning period. A-V practice is grounded in a model that requires parental involvement throughout the child's pre-school and school years. The overall goal of this approach is to enable children to participate fully in typical learning and social environments.

**VOICE supports parents' right to choose the communication option for their child.** To support parents who would like a spoken language outcome for their child with hearing loss, VOICE provides A-V intervention and actively engages in advocacy to promote listening and spoken language development.

**VOICE advocates that parents be provided with information based on the best available evidence to make an informed decision about communication development for their children.**

**VOICE supports access to appropriate services provided through qualified professionals.**

Children with hearing loss and their families require access to professionals with specialized education, training and accreditation in the language and communication method chosen by the parents for

their child. VOICE supports service provision by professionals who have attained certification in A-V communication or are engaged in mentored-training leading towards certification. All VOICE therapists are Listening and Spoken Language Specialists (LSLS), certified Auditory-Verbal Therapists or Auditory-Verbal Educators. A-V practice must be conducted in adherence to all 10 LSLS Principles of Auditory-Verbal Therapy and Auditory Verbal Education as well as the Principles of Professional Behavior and Code of Conduct set out by the AG Bell Academy International Certification Program for Listening and Spoken Language Specialists. ([www.agbellacademy.org](http://www.agbellacademy.org)).





# Communication Options for Children with Hearing Loss: Helping Parents make a Choice for their Child

When a child is born, parents anxiously await each developmental milestone and excitedly share their child's first words with friends and family. But what if that child has a hearing loss? Children who are born with normal hearing progress through a series of stages before using first words. Over the past years, research has exploded the myth that children do not respond to speech until they are one year old<sup>1</sup>. We now know that children respond to sound even before birth. Initially, infants cry when they are in distress or need something, and coo when content. Interestingly, an infant's cry is distinct to the language used in their environment from birth – such distinctions develop as babies hear the intonation patterns of their native language. By age six months, the sounds made by infants are distinct to their native language, and they use combinations of consonant and vowel sounds called babbling. First words appear at one year of age, and from there, vocabulary grows, and children combine words to form phrases and sentences until they become proficient in the language(s) spoken in their environment. Spoken language contributes to children's success in school because oral language lays the foundation for literacy. Universal Newborn Hearing Screening programs across Canada, the United States, and Europe are allowing children with hearing loss to progress through developmental milestones and achieve academic success similar to children without hearing loss.

## Communication Choices

When a child is identified with hearing loss, families are faced with choosing a communication lifestyle: the listening/speaking option which includes auditory-verbal/oral approaches, or a visual/manual system of communication, such as American Sign Language (ASL), or Total Communication (TC), which combines basic signs, gestures, and speech. Parents need support in sorting out which approach best meets their family's needs.

Newborn Hearing Screening statistics in Canada indicate that 90% of children born with hearing loss have hearing parents. Some professionals support the notion that a child, regardless of hearing ability, is born into the linguistic culture of the family (English, French, Spanish, etc).<sup>2</sup> These are the fluent language models that families naturally provide. For these families, an auditory-verbal/oral approach may be preferred. The rapid development of assistive technology for hearing loss has made auditory/oral options achievable for the majority of children born with hearing loss. Parents who choose an

auditory-verbal/oral approach can assist their child to listen and speak with well-fit hearing technology (hearing aids or a cochlear implant).

Deaf culture advocates, on the other hand, assert that visual/manual languages are the natural language for all children with hearing loss. Pursuing this option requires family members to learn a "new" language for communication. However, exposure to fluent language models is important for a child to learn that language. Hearing parents who are new to sign language have a limited capacity to provide fluent models for their child.

## Do Children with Hearing Loss Prefer Visual Input?

Historically, it was thought that children with hearing loss have a stronger sense of vision to compensate for their less than perfect hearing. This makes intuitive sense, especially for children who were born with a hearing loss prior to the 1980s when hearing technology was limited. However, infants with normal hearing naturally show a preference for auditory information. The auditory system begins to respond to sound at 12 weeks gestation, whereas it takes the visual system up to six months after birth to reach the same levels. Infants born with hearing loss, who are diagnosed and given access to sound by age six months, can develop hearing and visual systems in synchrony with each other, just as for children with normal hearing. Researchers have recently shown that children with normal and impaired hearing show a similar preference for auditory information.<sup>3</sup> Thus, families who follow an auditory-verbal/oral approach, and provide stimulation with well fit hearing technology, can be reassured that this is an advantageous approach.

Ideally, all children need to make use of both auditory and visual cues when processing information since information provided by these systems is complimentary and redundant. This assists all children in processing speech, and other elements of communication such as facial expression and emotional cues. The common use of emoticons while using electronic devices illustrates our need to convey emotional tone in our communication, without which misunderstanding may occur. Children and adults can more accurately determine a message when they can integrate the visual and auditory cues (facial expression and tone of voice). Children who receive early access to hearing technology and pursue an auditory/oral approach show better auditory integration skills, and process information more quickly and accurately.<sup>1-6</sup>

# Communication Options for Children with Hearing Loss: Helping Parents make a Choice for their Child

## Literacy Development: The Key to Future Success

Literacy skills are another important factor in a parent's choice regarding communication. Research demonstrates that a child's ability to understand the connection between sounds of spoken words and print/ letters, is essential to reading and writing.<sup>7,8</sup> Children with hearing loss who learn an auditory-verbal/oral language have superior outcomes in literacy scores as compared to children who use visual/manual languages.<sup>7,8</sup> Many families view literacy outcomes as a significant factor in their choice of a language. In a society where literacy skills are important for higher level education and future employment opportunities, the path is clear for most parents.

## Informed Parental Choice is Critical

No matter what choice parents make for their child with hearing loss, it is important for professionals to be respectful. Many parents are initially confused by the seemingly polar perspectives on communication options for a child with hearing loss. Some worry that their child may not be able to succeed in an auditory-verbal/oral approach. Parents need to know that they can adjust their choice based on the changing needs of their child. Communication options need to be considered in the context of many factors, including language fluency, availability of technology, future education prospects, and factors intrinsic to the global developmental needs of the child. By providing evidence-based information that outlines the potential outcomes of each approach, professionals provide families with the information they require to make the important decision regarding which option is best suited to their family and child.

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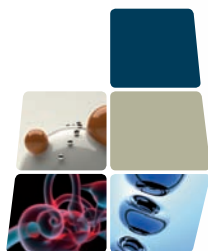
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