Children With Hearing Loss

Developing Listening and Talking

Birth to Six

Third Edition

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Preface

Hearing loss is the most common birth defect. The National Institute on Deafness and Other Communication Disorders estimates that as many as 12,000 new babies with hearing loss are identified every year. In addition, estimates are that in the same year, another 4,000 to 6,000 infants and young children between birth and 3 years of age who passed the newborn screening test acquire late onset hearing loss. The total population of new babies and toddlers identified with hearing loss, therefore, is about 16,000 to 18,000 per year.

The danger is that hearing loss caused by damage/blockage in the outer, middle, or inner ear keeps auditory/linguistic information from reaching the child's brain, where actual hearing occurs. Over the decades, numerous studies have demonstrated that when hearing loss of any degree is not adequately diagnosed and addressed, insufficient auditory information reaches the brain. As a result, the child's speech, language, academic, emotional, and psychosocial development is at least compromised if not sabotaged.

In recent years, there has been a veritable explosion of information and technology about testing for and managing hearing loss in infants and children, thereby enhancing their opportunities for auditory brain access. The vanguard of this explosion has been newborn hearing screening. As a result, in this day and age, we are dealing with a vastly different population of children with hearing loss, a population that never before in history have we had. With this new population whose hearing loss is identified at birth, we can facilitate access of enriched auditory/linguistic information to the baby's brain. The miracle is that we can prevent the negative developmental and communicative effects of hearing loss that were so common just a few years ago. With these babies and young children, we can now work from a neurological, developmental, and preventative perspective rather than from a remedial, corrective one. What has happened in the field of hearing loss is truly revolutionary as we implement brain-based science.

How do we understand and manage this new population of babies and their families? How do we revise our early intervention systems to respond to the desired outcomes of listening and talking that today's parents have a right to expect? The third edition of *Developing Listening and Talking, Birth to Six* is an exciting and dynamic compilation of crucially important information for the facilitation of brain-based spoken language for infants and young children with hearing loss.

This text is intended for undergraduate and graduate-level training programs for professionals who work with children who have hearing loss and their families. This third edition is also directly relevant for parents, Listening and Spoken Language Specialists (LSLSs), speech-language pathologists, audiologists, early childhood instructors, and teachers. In addition much of the information in Chapters 1 through 5, and also Chapter 7 can be helpful to individuals of *all* ages who experience hearing loss, especially to newly diagnosed adults, as a practical "owner's manual."

This third edition covers current and up-to-date information about auditory brain development, listening scenarios, auditory technologies, spoken language development, and intervention for young children with hearing loss whose parents have chosen to have them learn to listen and talk. Additions include updated information about hearing instruments and cochlear implants, discussion about the use and efficacy of coaching and other parent guidance strategies, expansion of the kinds of services a child with age-appropriate skills needs in order to sustain their positive academic trajectory, and ways to build skills for independence and self-advocacy in young children. Parents who are considering preschool placement for their children are referred to the newly revised Appendix 5 for a guide to elements that need to be present in any group setting to address the unique needs of the child with hearing loss. Also new is online access to user-friendly versions of the "Framework for Maximizing Caregiver Effectiveness in Promoting Auditory/Linguistic Development in Children Who Have Hearing Loss" (Chapter 10), and of the "Targets for Auditory/Verbal Learning" (Appendix 3).

Appendices 7, 8, 9, and 10 provide important and useful information and tools for professionals who are interested in AG Bell Academy's Listening and Spoken Language Specialist Certification Program (LSLS)—LSLS Cert. AVT and LSLS Cert. AVEd.

New Context for the Word *Deaf*

Today, hearing aids and/or cochlear implants and wireless microphone technologies can allow the brains of infants and children with even the most profound hearing loss/deafness access to the entire speech spectrum. There is no degree of hearing loss that prohibits the brain's access to auditory information if cochlear implants are available. Degree of hearing loss as a limiting factor in auditory acuity is now an "old" acoustic conversation. That is, when one uses the word *deaf*, the implication is that one's brain has no access to sound, period. The word *deaf* in 1970 or even in 1990 occurred in a very different context than the word *deaf* as used today. Today's child who is deaf but who is given appropriate hearing aids or cochlear implants can actually hear well enough to perceive and understand spoken language. This means that his or her brain has been developed with meaningful sound—that is, with auditory-linguistic information. That child is deaf without his or her equipment but certainly does not function as deaf in the 1970 or even in the 1990 sense. Perhaps we need some new words because the context has changed.

So, how do today's listening and talking children describe their hearing loss? Rhoades (2014), in her work with children, suggests using the term "person with hearing differences," rather than "person with a hearing loss." Addressing the same issue, Kemmery and Compton (2014) conducted an in-depth exploration of four teenager's perceptions of their identity related to hearing loss. The researchers identified a fluid continuum of identity types that included (a) hearing, (b) person with hearing loss, (c) hard of hearing, (d) hearing impaired, and (e) deaf (medical definition). Although the teenagers in the study chose the "hearing identity type" as the one sought after, three key factors influenced which identity type was selected at any point in time: interactions with others, environment, and life experiences. That is, a person may choose one identity type in one context and a different identity type in another context. Finally, parents, practitioners, and teachers need to realize that the ways they view a child may differ from the child's own view of themselves and their hearing loss (their hearing differences) at any point in time.

Hearing Versus Listening

There is a distinction between hearing and listening. Hearing is acoustic access to the brain. For children with hearing loss, hearing includes improving the signal-to-noise ratio by managing the environment and utilizing hearing technologies. Listening, on the other hand, is when the individual attends to acoustic events with intentionality.

Sequencing is important. *Hearing* must be made available before *listening* can be taught. That is, parents and interventionists can focus on developing the child's listening skills, strategies, and choices only after the audiologist channels acoustic information to the brain by fitting and programming technologies—not before.

A Model of Hearing Loss: The Invisible Acoustic Filter Effect

Hearing loss of any type or degree that occurs in infancy or childhood can interfere with the development of a child's spoken language, reading and writing skills, and academic performance (Davis, 1990; Ling, 2002; Madell & Flexer, 2014b). That is, hearing loss can be described as an *invisible acoustic filter* that distorts, smears, or eliminates incoming sounds, especially sounds from a distance—even a short distance. The negative effects of a hearing loss may be apparent, but the hearing loss itself is invisible and easily ignored or underestimated.

> *Lack of high-fidelity acoustic information to the brain is the biggest challenge worldwide. It is imperative to have very high expectations for today's technologies to make soft sounds available to the brain at a distance and in the presence of noise. Children must use technologies that enable them to overhear conversations and to benefit from incidental learning in order to maximize their auditory exposure for social and cognitive development.*

It is critical to note that as human beings we are neurologically "wired" to develop spoken language (speech) and reading skills through the central *auditory* system (Figure 1–4). Most people think that reading is a visual skill, but recent research on brain mapping shows that primary reading centers of the brain are located in the auditory cortex—in the auditory portions of the brain (Chermak et al., 2014; Pugh et al., 2006; Tallal, 2005). That is why many children who are born with hearing losses and who do not have

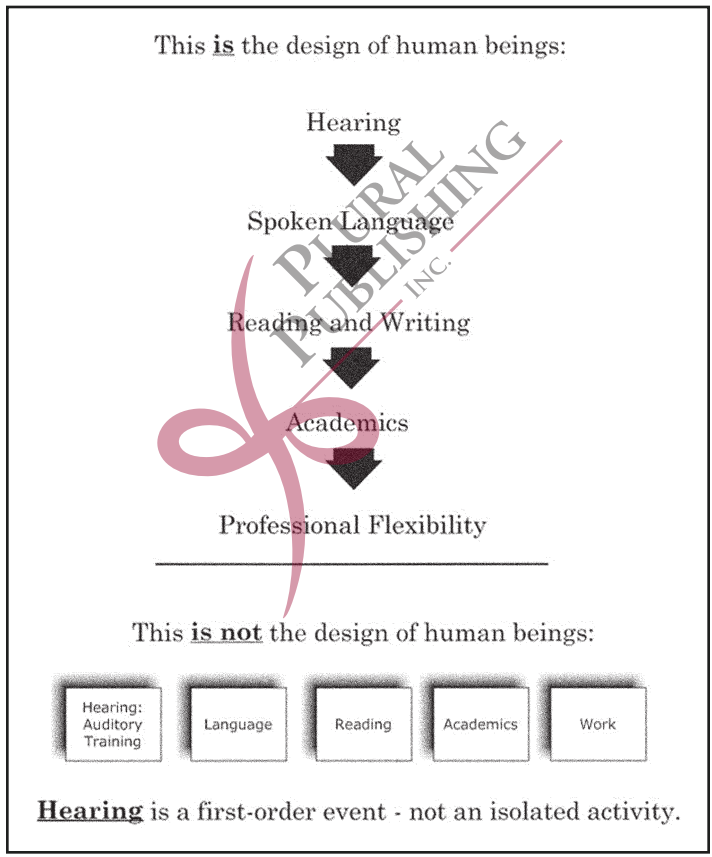


Figure 1–4. The design of human beings is such that hearing (auditory neural growth) is a first-order event for the development of language, reading, and academic skills, not an isolated activity.

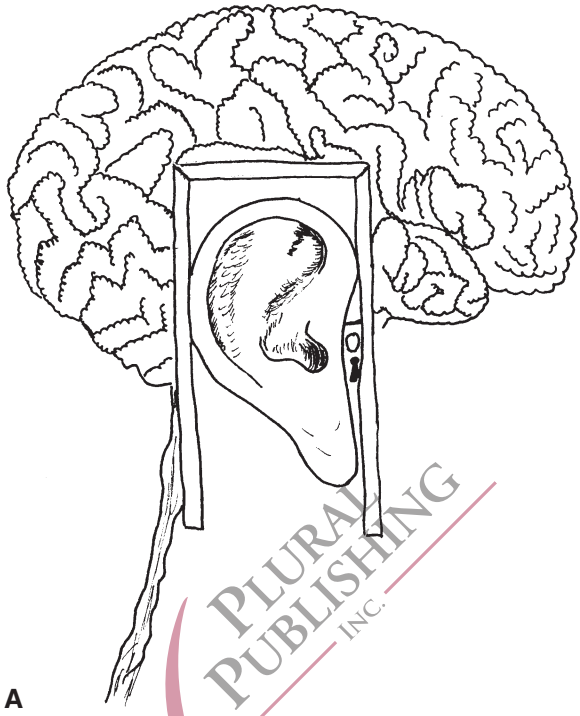
brain access to auditory input when they are very young (through hearing aids or cochlear implants and auditory teaching) tend to have a great deal of difficulty reading even though their vision is fine (Robertson, 2014). Therefore, the earlier and more efficiently we can allow a child access to meaningful sound with subsequent direction of the child's attention to auditory information, the better opportunity that child will have to develop spoken language, literacy, and academic skills. With the technology and early auditory intervention available today, a child with a hearing loss *can* have the same opportunity as a typically hearing child to develop spoken language, reading, and academic skills even though that child hears differently.

Think About Hearing Loss as a Doorway Problem

Here is another way to think about hearing loss. To begin with, we hear with the brain . . . hearing loss represents a "doorway" problem (Figure 1–5). That is, the hearing loss (damage in the outer, middle, and/or inner ear) prevents auditory information from passing through the doorway to the brain. If sound/information does not reach the brain in sufficient quantity and quality, neural connections will not develop well, and the child's spoken language, literacy, and knowledge will be limited. Technology (hearing aids, cochlear implants, FM systems, etc.) are devices designed to transmit auditory information through the doorway to the brain where actual hearing occurs.

Summary: The "Essential Question" That Drives Technological and Intervention Recommendations

The bottom-line *Essential Question* for families to answer is: What is your vision for your child? Ninety-five percent of children with hearing loss are born into hearing and speaking families (Mitchell &



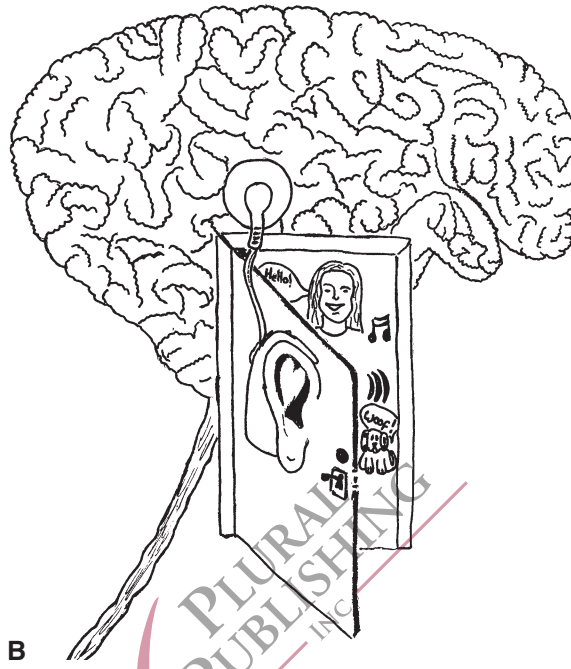
A

Figure 1–5. The ear is the "doorway to the brain" for sound/auditory information. **A.** Hearing loss obstructs that doorway, preventing auditory information from reaching the brain. *continues*

Karchmer, 2004); they are interested in having their child talk. Once we know that listening and speaking are desired outcomes, the next conversation is, "what will it take?"—since that is the *Essential Question* for professionals to answer right from the beginning.

Please note that the second half of this book contains detailed instruction in the development of listening and talking. Here is the answer, in a nutshell. To develop listening and talking, it takes the following:

- Early identification and intervention to take advantage of neuroplasticity and developmental synchrony
- Vigilant, ongoing, and kind audiologic management



B

Figure 1–5. *continued* **B.** Hearing aids and cochlear implants break through the doorway to allow access, stimulation, and development of auditory neural pathways.

- Immediate and consistent brain access of auditory/linguistic information via technology—hearing aid loaner banks—to preserve and develop auditory neural capacity
- Guidance from a professional who is highly qualified in the development of listening and speaking through techniques of parent coaching
- Following the professional's coaching with daily and ongoing formal and informal auditory, language, cognitive, and literacy enrichment
- Integrating and using auditory strategies in all-day, everyday interactions with the child to "grow the baby's brain." See Appendix 1 for a handout of How to Grow Your Baby's or Child's Brain.

What Will It Take?

Because early intervention is a family-focused strategy, it is necessary that families assist in formulating their role. A "what will it take" conversation with families is important to clarify the necessary steps to attaining the family's desired outcome of listening and talking. One strategy is to use the analogy of driving a car. What are the steps necessary to acquire the desired outcome of a driver's license? Well, to begin with, one needs to have access to a car. Then, a coach or driving instructor is sought. Most states then require up to 150 hours of supervised driving practice with a licensed, adult driver. Next is the necessity of passing a written exam and a vision exam, followed by a practical exam—the driving test. If all that is completed satisfactorily, one has a driver's license. If any requirement is deleted, the driver's license is not achieved no matter how badly one wants it or how sympathetic the excuses.