What really is deafness? Is it a number on a decibel scale that describes the severity of hearing impairment? Is it a disease like mumps or measles or meningitis? Is it an ankylosed stapes? Is it a piece of tissue in the auditory system that would be judged to be abnormal if viewed under a microscope? Is it an affliction to be conquered by the ingenious scientist? Is it the burden of a child whose parent hopes persistently and fervently that the scientist will be successful and soon? Is it a special mode of communication? Is it something that is encountered occasionally in the man or woman whose fingers fly and whose utterances are arrhythmic and strident? Is it a cause to which diligent, skillful, and patient teachers have committed themselves for generations? Is it the agony of isolation from a piece of the real world? Is it the joy of accomplishment that mocks the handicap? Is it the bright mind and the potentially capable hands for which the economy has no use because they are uncultivated? Is it a crystallization of attitudes of a distinctive group whose deafness, modes of communication, and other associated attributes . . . that they have in common cause them to band together to achieve social and economic self-realization? Of course, it is all of these and more, depending on who ask the question and why.

—Davis & Silverman (1978, p. v)

Key Concepts

After completing this chapter, readers should have a basic understanding of:

- Audiologic descriptions of hearing acuity
- The importance of hearing and speech
Chapter 1  Introduction to Hearing and Deafness

- Major concepts in the book

- Perspectives of the authors

Despite the use of a few outdated words and phrases, the passage by Davis and Silverman (1978) at the beginning of this chapter continues to be awe inspiring, perhaps prophetic even, more than 30 years since its publication. One can see the precursors to the major perspectives on deafness, often characterized—on a superficial level—as the clinical-cultural dichotomy (e.g., Baker & Cokely, 1980; Paul, 2009; Paul & Jackson, 1993). Clinically, deafness, in its broadest meaning, includes all degrees of hearing loss, from slight to profound, and is viewed as a disease; a disability; something that causes problems; something to eradicate, overcome, or prevent. Culturally, deafness (i.e., mostly individuals with severe-to-profound hearing loss, who are members of a culture) is a natural condition, which should be preserved and revered, especially because it is often accompanied by the use of the language of signs. It can be argued that categorizing perspectives as either clinical or cultural is most likely an oversimplification that undermines the complexity of the manner in which humans develop their attitudes, mores, and belief systems.

Most likely, Davis and Silverman did not have a crystal ball that would have illustrated graphically and strongly the varying implications of what they wrote. Viewing deafness as a natural, cultural condition in which individuals are often associated with members of a sociological group has resulted in an extension of effective methods used in the education and rehabilitation of children and adolescents. Educators, clinicians, and other professionals have been (or should be) exposed to ideas and positions pertaining to the rights of Deaf individuals (capitalized D refers to members of the culture).

It is important also to be introduced to, to understand, and to respect the terminology reflecting the empowerment of minorities, in this case the terms Deafhood, Deaf Identity, DEAF-WORLD, and Deaf Epistemologies (similar to Feminist or African American Epistemologies, which is the basis for Feminist [or Women] or African American Studies, respectively. Note: epistemology refers to the nature, extent, and perspective on knowledge.). This awareness has led to the call and need for the involvement of Deaf teachers, administrators, and researchers and for the right of every d/Deaf person to learn to communicate effectively. Within this perspective, some scholars might add that effective communication is most likely via the use of a sign language, particularly American Sign Language in the United States (e.g., see discussions in Bauman, 2008; Ladd, 2003; Lane, 1992; Lane, Hoffmeister, & Bahan, 1996).

However, Davis and Silverman (1978) could not foresee our deeper, current understanding of the effects of any level of hearing loss on the development of speech, language, and literacy in English (in our case). Just think of the impact of conditions such as unilateral (one ear) hearing loss, fluctuant hearing loss, and chronic otitis media (middle ear infections). In one sense, to put it mildly, and perhaps metaphorically, hearing is or might be important for the development of speech, language, and literacy in English. We shall expound on this proclamation periodically throughout this text.

Our goal is not to promote one perspective over the other. We feel that there is a place for both in the education and/or rehabilitation of children, adolescents, and adults who
are d/Deaf or hard of hearing. In essence, both views should be valued and respected, and
the decision to adhere to or apply one or the other or some combination of the two frame-
works might best be left up to educators and parents and, ultimately, to children who are
d/Deaf and hard of hearing as they become older and more mature.

Nevertheless, the tensions and controversies engendered by these dichotomous, albeit
limited, perspectives may have resulted in the downplaying of the importance of the vari-
ables of hearing and speech in the developmental stages of most individuals who have
severe-to-profound hearing losses and—from a radical standpoint—even in those with
less severe hearing losses. More often than not, the concepts of hearing and speech have
become, or can become, negative, perfunctory terms and/or are deemed to be, for the most
part, inaccessible to or inappropriate for many individuals who are d/Deaf or hard of hearing (e.g., see discussions in Lane, 1992; Lane et al., 1996; cf., Paul, 1996, 1997; Trezek,

In our view, professionals who work in fields such as deaf education, audiology, speech
and language pathology, educational interpreting, and in other related fields need an ade-
quate understanding of the contribution and rehabilitation of hearing (and speech). A
strong case for developing such an understanding can be made given the advent of advanced
amplification systems and the emerging focus on the importance of phonemic and phono-
logical awareness for both English language and literacy development (e.g., National Read-
ing Panel, 2000; Paul, 2009; Snowling & Hulme, 2005; Trezek et al., 2010).

It might come as a surprise that this also applies to learning English either as a first or
second language. In fact, the interrelations among hearing, speech, language, and literacy
are so incredibly complex that research has not teased out the major contributions of their
various aspects (e.g., McGuinness, 2004, 2005). Nevertheless, the interrelations cannot
be ignored by educators and professionals.

In this text, our major focus is to provide up-to-date information on an array of criti-
cal areas in speech and hearing, such as hearing aids, cochlear implants, speechreading,
aural rehabilitation, and the necessary constructs for developing English language and lit-
eracy. We want professionals not only to possess such current knowledge, but also to develop
skills that can be used in their work settings. With our backgrounds (speech and hearing
science and education), we feel that we are in a position to illustrate clearly the connec-
tions between knowledge and practice, particularly from an interdisciplinary framework.
We aim to produce a text that is solid with respect to theory and research and that also
contains demonstrations of practice.

As you read this chapter, we encourage you to think of questions that you expect to be
answered or at least addressed. For example, you might consider questions related to the
Key Concepts:

■ What are the audiologic dimensions of a hearing loss? Is this important to know for
the development of speech and language?

■ Why is audition (hearing) important for speech and language development? Will this
be related to the development of English? Will this be related to the development
of English literacy? What about English as a second language?
Chapter 1 Introduction to Hearing and Deafness

- What are the major concepts to be discussed in this text? What will this chapter discuss with respect to these concepts?
- What are the theoretical/research orientations of the authors? Why is this important for me to know as a reader?

We shall return to these questions and more (hopefully, some of yours!) in the summary section of this chapter.

Audiologic Descriptions of Hearing Acuity

Hearing impairment is a generic term referring to all types, causes, and degrees of hearing loss. To delineate the impact of a hearing loss on the development of English speech, language, and literacy, a number of descriptive variables have been identified, including degree of hearing impairment; age at onset; age at identification; etiology; presence of additional disabilities; and hearing status, level of involvement, communication mode, socioeconomic status of the parents or caregivers. In this chapter, our goal is to provide some introductory information and to focus mainly on the degree of hearing loss and age at onset—two critical traditional variables for habilitation and rehabilitation purposes. These two variables have had a pervasive effect on the development of speech, language, and literacy in English. Age at identification, another critical variable, is discussed in the chapter on early intervention (Chapter 9).

An individual's hearing threshold level is indicated on the audiogram across a range of octave frequencies between 250–8000 Hz. The individual's audiogram results are often reflected in one number, known as a pure tone average (PTA). It is the average unaided threshold across three frequencies (500, 1000, and 2000 Hz) and is thought to reflect an individual's abilities to detect speech information. The PTA is designed to chart hearing sensitivity from 0 to 110 dB (see discussions in Ross, 1986; Schow & Nerbonne, 2007).

Much of the emphasis in describing hearing loss has been placed on the degree of hearing loss. Although all of the factors mentioned previously should be considered concomitantly, degree of impairment has assumed the most weight in determining the educational placement of children who are d/Deaf or hard of hearing, rehabilitation procedures, and even the selection of amplification systems (e.g., Karchmer, Milone, & Wolk, 1979; Paul & Quigley, 1990).

To simplify matters, here we group hearing loss into five categories: slight, mild, moderate, severe, and profound (see Table 1-1). Traditionally, students in the first three categories have been referred to as hard of hearing, whereas those in the last one are labeled as deaf. Students in the category of severe hearing loss can constitute a mixed bag, so to speak. Historically, these students have been labeled as either hard of hearing or deaf, depending on their use of residual hearing (i.e., remaining or usable hearing).

It is possible for an individual in the severe category, for example, to function like a hard of hearing person in the areas of speech, language, and literacy even though she or he may...
be audiometrically deaf (Paul, 2001, 2009; Schow & Nerbonne, 2007). Our contention is that with early intervention and early amplification many individuals with severe-to-profound hearing losses can perform like hard of hearing individuals, which essentially means that they are connected to the world of sound (or audition). Being connected to the world of sound facilitates the development of spoken language and its written equivalent.

### Table 1-1: Categories of Hearing Loss

<table>
<thead>
<tr>
<th>Degree of Hearing Loss in dB</th>
<th>Description</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 26</td>
<td>Normal</td>
<td>No special class or treatment is necessary, but professionals should monitor language and academic progress.</td>
</tr>
<tr>
<td>27–40</td>
<td>Slight</td>
<td>Typically, special class or treatment is not required. Some individuals might need instruction in speechreading and speech. May need amplification and/or assistance in language and literacy development.</td>
</tr>
<tr>
<td>41–54</td>
<td>Mild</td>
<td>A number of individuals need special class and/or school placement. Most of these individuals will require targeted instruction in speechreading and in certain aspects of speech. Typically, most individuals in this area need specialized assistance in language and/or literacy development.</td>
</tr>
<tr>
<td>55–69</td>
<td>Moderate</td>
<td>Many individuals in this category require special class and/or school placement. A large number might need instruction in speechreading and in the development of speech. Almost invariably, these individuals will need specialized instruction in language and literacy.</td>
</tr>
</tbody>
</table>

(continues)
What might be surprising to most professionals and other interested individuals is that limited research exists on the relationship between a specific category of hearing loss (i.e., slight, mild, etc.) and educational achievement. Nevertheless, professionals need to be aware of and attend to children with any level of hearing loss, from slight to profound. Even a slight hearing loss can affect the development of language and literacy.

With respect to Table 1-1, scholars have offered general educational implications with regard to degrees of hearing loss (e.g., Paul & Quigley, 1990; Schow & Nerbonne, 2007). These implications (e.g., effects on speechreading, educational placement, etc.) are affected by individual differences, especially when age at onset and age at identification are considered in conjunction with degree of impairment.

<table>
<thead>
<tr>
<th>Degree of Hearing Loss in dB</th>
<th>Description</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>70–89</td>
<td>Severe</td>
<td>Most individuals in this category require a full-time special education program with specialized, targeted instruction in language and literacy. An array of support services should be provided, as well as training in speechreading, speech, and the use of residual (i.e., usable or remaining) hearing.</td>
</tr>
<tr>
<td>&gt;90</td>
<td>Profound or extreme</td>
<td>Most individuals require a full-time special education program with specialized instruction in language and literacy development. Comprehensive support services are needed. Training in speechreading, speech, and the use of residual hearing is mandatory. A number of individuals might require the use of sign communication.</td>
</tr>
</tbody>
</table>

Note: A few scholars (e.g., Schow & Nerbonne, 2007) assert that there should be two sets of categories for slight and mild—one for children and one for adults; however, research has not documented substantial differences between these two sets. Others argue that the slight impairment category should begin at 15 or 16 dB, instead of 27 dB (e.g., Ross, 1986).

Sources: Adapted from Paul (2009), Ross (1986), and Schow & Nerbonne (2007).
Age at onset refers to the age at which the loss is sustained. It is often examined in relation to the optimal period for the acquisition of a spoken language, usually from birth to about 2 years. The more severe the hearing loss, the more crucial age at onset becomes for the development of a spoken language. When degree of impairment is considered in conjunction with age at onset, research has shown a significant effect on the development of spoken and written English skills (e.g., King & Quigley, 1985; Paul, 2009; Trezek et al., 2010). For example, children who acquire a severe-to-profound hearing loss at age 5 years may exhibit the same level of loss as those who incur this loss at birth; however, their language and communication skills are very different (e.g., Paul, 2009; Quigley & Kretschmer, 1982). As is discussed later in this text, the effects of age at onset can be minimized or reduced if the age at identification occurs early; that is, by early intervention at as early an age as possible.

**Importance of Hearing and Speech**

It seems axiomatic to discuss the importance of hearing and speech for language and literacy development in English. There is little debate that the loss of hearing affects the communication process with respect to the use of a spoken language. The root of the problem, however, resides in the pervasive impact of the hearing loss on the acquisition of oral or spoken foundational symbols; that is, the experiential and meaningful stimuli deemed necessary for the development of spoken language.

Let us illustrate this point another way with a passage that is still applicable, albeit with some updates that are discussed later in this text (Lovinger, Brandell, & Seestedt-Stanford, 1991):

Stop for a moment and listen. What do you hear? ... How did we learn to discriminate these sound differences, associate sound to experience, and then give them meaning? How did we learn to understand sound, to form words to communicate?

The role of the ear in the normal course of speech development cannot be overemphasized. The ear serves as the main feedback mechanism in the development and production of speech. Sound is received by the ear, is interpreted by the brain and a reaction is expressed by the use of words. Input of sound to the brain for storage, analysis, and association is done through the ear. Not to hear the human voice is not to develop the ability to speak. It is well established that individuals born with significant hearing loss are unable to develop oral communication naturally. Whereas normal hearing children learn language first, later applying rules, deaf children learn the rules of language first in order for linguistic competencies to be obtained. (p. 17)

The conservation and rehabilitation of hearing (and speech and language) become necessary tasks for educators, audiologists, and speech-language pathologists. We can drive home the point by noting (again) that it is not always obvious that even a relatively slight hearing loss can negatively affect the development of spoken language, literacy, and academic achievement (e.g., Ross, Brackett, & Maxon, 1982; see also, the discussions in Paul, 2009; Spencer & Marschark, 2006). **Audition**, the meaningful use of hearing (or residual
Chapter 1 Introduction to Hearing and Deafness

hearing), plays a critical role in the internalization, storage, and retrieval of spoken-language information by individuals, which becomes evident during a variety of cognitive and linguistic functions (e.g., answering questions, drawing conclusions, reciting a poem, writing a paper, presenting on a topic, reading).

With respect to typical language development, the production and comprehension of speech occur after a reasonable growth of inner (or internalized) spoken-language structures (i.e., structures related to phonology, morphology, syntax, etc.). Inner language results from the process of relating incoming, meaningful auditory stimuli to appropriate kinesthetic, tactual, and visual images (e.g., Ling, 1989, 2002; Ross, 1986). The individual internalizes these stimuli via the use of auditory perceptual abilities. In other words, individuals possess the ability to attend to, discriminate, recognize, and retain sensory input.

In order to develop adequate auditory perceptual abilities, individuals need reasonably intact peripheral mechanisms of hearing. The peripheral mechanisms involve the outer, middle, and inner structures of the ear (see Chapter 2). Also critical is the proper functioning of the central nervous system mechanisms and the auditory cortical structures of the brain, which results in the transmission, integration, assimilation, and interpretation of incoming auditory stimuli.

In essence, the development of spoken-language structures requires, at the very least, the exploitation of reliable, consistent auditory/articulatory experiences at as early an age as possible. To prevent or minimize the condition of auditory sensory deprivation, educators and other professionals should promote and utilize early detection and intervention (e.g., see related discussions in Harrison, 2006a, 2000b; Spencer & Marschark, 2006). To understand the underlying components of intervention, professionals need knowledge of and skills in amplification systems (e.g., see Chapters 4 and 5); speech, language, and literacy (Chapters 6 and 7); and speechreading and auditory development (Chapter 8).

Speech, Hearing, and Literacy

Since the seminal work of Vickie Hanson (1989), there has been a growing awareness that the connections among speech, hearing, and the development of English literacy skills are often overlooked by many current speech-language pathologists, and even by those who become teachers/educators of d/Deaf and hard of hearing children. Consequently, a great deal of attention in speech and language intervention or therapy for d/Deaf and hard of hearing students in their formative educational years is placed on producing intelligible speech, rather than on relating the elements of speech (i.e., via phonemes, sounds) to the conditions of print (e.g., phoneme–grapheme relationships).

There is no question that intelligible speech is desirable; however, it is becoming clear that a cognitive knowledge (i.e., representation) of speech sounds, particularly as it relates to the alphabet, is a critical factor for the development of literacy skills. This cognitive knowledge requires adequate or reliable access to the sounds of speech (actually, the sound system of a language) either via the peripheral mechanisms of hearing or through alternative mechanisms based on vision and touch. However this is accomplished, it is crucial for
children to access the phonological level of a spoken language in order to develop language proficiency.

Phonology represents the building blocks of a language, whether spoken or signed. Phonological access is also critical for acquiring other components of the English language, such as morphology (e.g., word parts), syntax (word order), and aspects of semantics (meaning). A good rendition of the above discussion can also be found in other texts on language development (e.g., Catts & Kamhi, 2005; Owens, 2004; Pence & Justice, 2008).

Before becoming too enamored with the importance of speech and hearing skills for English language and literacy development, keep in mind that phonological and phonemic awareness are not the same as speech perception. Speech perception is the ability to detect and discriminate sounds. Because of the overlap of processing between speech perception and hearing ability, children with severe-to-profound hearing loss may also have poor speech discrimination skills. Even some children with otherwise typical intact hearing may have difficulty discriminating among speech sounds. For a number of reasons, children who possess poor speech discrimination skills have difficulty acquiring phonological awareness.

All of this does not mean that we should not work on the development of speech awareness, perception, and discrimination; we need to keep in mind that something more is needed for phonological and phonemic awareness. In any case, a deep awareness of phonology is important for developing both English speech, language, and literacy skills. This may become even more apparent when one considers the strong relations between phonology and short-term memory (peripheral memory) (discussed in Chapter 7).

The link between the conversational and written forms of English is also important for students learning English as a second language. Second-language students, including ASL-using d/Deaf students, typically do not begin English literacy development possessing the same level of proficiency of the English language and culture as native first-language learners (e.g., see discussions in Bernhardt, 1991; Horwitz, 2008; Paul, 2009). In addition, most second-language students have difficulty understanding the linguistic aspects of written English, for example, vocabulary, syntax, and the alphabetic principle.

Thus, if we hope to improve the English language and literacy levels of students who are d/Deaf and hard of hearing, then we need to find more effective methods (technological and educational) to assist them in learning the connections between the phonemes of speech and the graphemes of print (as well as other components related to English literacy). It should come as no surprise that this inevitably means that professionals need to understand the underpinnings of the development of language, speech, and audition and the accompanying amplification aspects (e.g., hearing aids, cochlear implants, etc.).

**Major Concepts**

By now, you might have figured out all or most of the major concepts that are discussed in this text. We present a brief description of these concepts in the following paragraphs. We also show how the chapters are connected.
Chapter 1 Introduction to Hearing and Deafness

If we intend to make a case for hearing, as accomplished eloquently by Davis and Silverman (1978) more than 30 years ago, then it is relevant to discuss the anatomy and physiology of the auditory mechanism (in Chapter 2). We shall present introductory information on the nature and perception of sounds and the nature of hearing loss.

After exposure to and understanding of the basic information in Chapter 2, you will be ready to interpret and use an audiogram and to understand hearing evaluations and hearing losses—the focus of Chapter 3. Professionals need knowledge of the development and characteristics of the audiogram from start to finish or, metaphorically and literally, from top to bottom. Relating the audiogram to the selection of a hearing aid or other amplification device is a given. However, a clearer picture of the value of hearing and the presence of an audiogram should shed light on the challenges of developing speech and language, especially a phonemic language such as English.

Having a solid background of the audiogram and hearing evaluation should facilitate the understanding of issues in the next two chapters (Chapters 4 and 5) on hearing aids and cochlear implants. The basic information on hearing aids should definitely not go into one hearing aid and out the other!

With respect to knowledge about hearing aids, it is important for professionals to know how to troubleshoot these systems (e.g., check for problems; provide basic maintenance, such as changing a battery, etc.). Troubleshooting is absolutely mandatory for teachers of the d/Deaf and hard of hearing and speech-language pathologists given the potential for breakdowns and situations that are bound to occur during a typical school day, especially with young children.

Research and development on digital hearing aids has benefited from advances in cochlear implantation research. Nothing causes more controversy (actually lots of heat and not much light!) than this topic, especially research on cochlear implants and the development of speech, language, and literacy. Like it or not, in our view there is no turning back—which is often the case for assistive technological innovations. During the 1980s, cochlear implants were like the early Ford Model T—and there were only a few of them. Now, more and more children are having cochlear implantations, and the devices have become more sophisticated.

With universal newborn hearing screening in place and the improvement in technology, cochlear implants have become more accepted and useful for individuals with severe-to-profound hearing losses. Educators, clinicians, and other professionals not only need to know the structure and function of a cochlear implant, but also, like a hearing aid, they need to know how to troubleshoot the instrument. We present a synthesis of the salient research findings on cochlear implants in Chapters 5 and 6.

We then move on to an examination of the development of speech and language (Chapter 6). Readers are introduced to the production of speech and the stages of language development, including specific components such as phonology, morphology, syntax, semantics, and pragmatics. We also focus on the nature or pattern of speech errors in children who are d/Deaf or hard of hearing.

It might be an understatement to assert (actually, repeatedly in our case) that hearing, or audition, contributes to the development of English language and literacy (i.e., reading and writing skills). We have argued that phonology represents the building blocks of learning.
ing a language, especially a language based on sound. In Chapters 6 and 7, we intend to
demonstrate this principle and to relate the component of phonology to the development
of the other components of English and to English literacy.

We emphasize that phonological (as well as phonemic) awareness assists children in
understanding the relations between sounds and letters for beginning reading acquisition.
Professionals should understand that to master the alphabetic system, the system upon
which English writing is based, children need a working knowledge of phonology, phonemic
awareness, and phonics skills, as well as other reading-related competencies.

Another important concept, examined in Chapter 7, is that of working memory and
its relation to reading. Finally, Chapter 7 presents alternative techniques of developing
phonological awareness. This entails a discussion of techniques such as cued speech/lan-
guage and visual phonics.

After completing Chapters 1 through 7, readers should have a sufficient background to
understand the major concepts in Chapter 8; that is, the development of aural rehabilita-
tion techniques or procedures, such as speechreading and auditory learning/training.
Speechreading (also known as lip reading) refers to the process of understanding a spoken
message by observing a speaker’s face. Auditory learning/training refers to the use of tech-
niques to assist children in their development of audition or the use of residual hearing.
Both speechreading and auditory learning/training are critical for the development of
speech production and speech reception abilities. In addition, both can contribute, indi-
rectly, to the development of English literacy skills.

One of the most important areas for the habilitation and rehabilitation of hearing is age
at identification, especially for the development and use of early intervention techniques
(Chapter 9). In our view, universal newborn hearing screening should truly be universal;
that is, for everyone on earth. In Chapter 9, we cover some of the basic tenets of early inter-
vention, for example, tasks of early identification of hearing loss, early amplification, the
involvement of parents, and the educational preparation of professionals (e.g., see Harri-
son, 2006a, 2006b; see also Yoshinaga-Itano, 2006).

We are aware that early amplification is a hotly contested issue, especially when the
decision involves cochlear implants. Nevertheless, we feel that there is no greater import-
ant issue than early intervention, and we have little or no doubt that the growth and
improvement in technology will minimize or resolve many of the conflicts associated with
early identification and amplification.

In Chapter 10, we argue for a team approach involving the collaboration of profes-
sionals working with children and adolescents who are d/Deaf and hard of hearing. At the
very least, we are concerned with this process for educators, educational audiologists,
speech-language pathologists, and educational interpreters. Other professionals, such as
those who provide occupational or physical therapy and other ancillary services, can be
involved as needed.

Collaboration is the key to success. School professionals need to be willing to work
together to ensure the most positive education experience for the child. Chapter 10 out-
lines the different professional roles that are involved in a d/Deaf or hard of hearing child’s
education. It also discusses how professionals can work together and what they should be

Major Concepts
Chapter 1  Introduction to Hearing and Deafness

offering to each other to foster an effective working relationship. No person is an island when it comes to serving the wide variety of needs of children and adolescents in the schools.

In Chapter 11, we reexamine the ongoing controversy on the development and use of speech and hearing for individuals who are d/Deaf and hard of hearing. In fact, after getting out our crystal ball, we present a few—perhaps, bold—surprises with our own reflections! Finally, the chapter offers a few recommendations for teacher education and clinical education programs in university settings.

Perspectives of the Authors

Our backgrounds are in education, both elementary education for typical children and deaf education, and audiology. We both favor the use of a traditional scientific approach, which involves some version of the scientific method (generating and testing hypotheses, analyses, etc.). We believe that there is such an entity as objectivity and that an adequate understanding of the world is possible via a dispassionate objective synthesis—similar to our attempts within the current text. We know that there is a bias in our integrative conceptual framework. Most likely, the bias cannot be removed completely, but it can and should be minimized via the use of the traditional scientific method.

We certainly have faith in the application of different research methods (e.g., quantitative as in the use of statistics or qualitative as in the use of case studies, ethnography, or critical analyses) as long as the undertaking of the study is rigorous and systematic. Whatever approach is used to develop theory and conduct research is acceptable as long as there is a reciprocal relation between theory and research; that is, theory building needs to yield to new research findings, which either support or refute aspects of the theory, and research thrusts should be guided, eventually, by well-grounded and well-developed theories. We also acknowledge that practice can inform theory and research as well as vice versa.

We are driven by our theoretical perspectives (e.g., cognitive and social theories), which guide our discussions of research, practice, and issues related to the development of speech, hearing, language, and literacy in English. We should emphasize that our heads are not only in the clouds (so to speak), but also in the classrooms and clinics. We are passionate about the desire to improve the educational and social welfare of children and adolescents who are d/Deaf and hard of hearing. Thus, we want to create a text that is useful and usable for students and perhaps reinvigorating for inservice professionals. Not only do we discuss research, but we also provide what we hope to be helpful examples and exercises related to the major concepts in this book. Our strongest bias is this: hearing is important if the goal is to acquire a spoken language such as English, including the ability to read and write in this language.

Summary of Major Points

Now that you have completed this chapter, we hope that you have found some possible answers to the questions that you developed at the beginning of the chapter. It might be that you need to read further in this text. If your questions did not get answered, then
we encourage you to do additional reading and/or to dialogue with your instructor. The overall intent of this chapter was to provide a brief introduction to the major themes and concepts that are discussed in the rest of the text. The Key Concepts were as follows:

- Audiologic description of hearing acuity
- The importance of hearing and speech
- Major concepts in the book
- Perspectives of the authors

With respect to audiologic descriptions of hearing acuity, we remarked that

- Clinical descriptions employ the use of audiologic and linguistic dimensions such as degree of hearing loss, age at onset, etiology, location, presence of additional disabilities, and hearing status of parents/caregivers.
- Two of the long-standing factors that have influenced educational placement and other issues are degree of hearing loss and age at onset. Both were described in detail in this chapter.

With respect to the importance of hearing and speech, the following points were made.

- Audition plays a critical role in the internalization, storage, and retrieval of spoken-language information by individuals, which becomes evident during a variety of cognitive and linguistic functions.
- With respect to typical language development, the production and comprehension of speech occur after a reasonable growth of inner (or internalized) spoken-language structures. Inner language results from the process of relating incoming, meaningful auditory stimuli to appropriate kinesthetic, tactual, and visual images. The individual internalizes these stimuli via the use of auditory perceptual abilities.
- The development of spoken-language structures requires, at the very least, the exploitation of reliable, consistent auditory/articulatory experiences at as early an age as possible. To prevent or minimize the condition of auditory sensory deprivation, educators and other professionals should promote and utilize early detection and intervention.
- It is becoming clear that a cognitive knowledge (i.e., representation) of speech sounds, particularly as it relates to the alphabetic system of English, is a critical factor for the development of literacy skills. This cognitive knowledge requires adequate or reliable access to the sounds of speech.

In our review of major concepts, it was highlighted that

- Professionals who work in fields such as deaf education, audiology, speech pathology, educational interpreting, and in other related fields need an adequate understanding
Chapter 1  Introduction to Hearing and Deafness

of the contribution and rehabilitation of hearing (and speech) to the development of English, including English literacy skills.

■ With the advent of advanced amplification systems, early intervention, and the emerging focus on the importance of phonemic and phonological awareness for both English language and literacy development, there needs to be a reconceptualization of the contributions of hearing (i.e., audition) in the lives of professionals who serve children and adolescents, especially those with hearing losses.

■ Rehabilitation and alternative means are also important. These include speechreading, auditory learning/training, and the use of visual phonics and cued speech/language.

■ Increased collaboration is needed among the various professionals working with individuals who are d/Deaf and hard of hearing.

In the section on the authors' framework, it was remarked that the authors

■ Favor the use of the traditional scientific method, particularly for building upon previous research and for offering generalizations.

■ Believe in the concept of objectivity, especially via the use of an integrative conceptual framework (i.e., synthesis). Such scholarly endeavors—indeed, all scholarly endeavors—should continually be debated and tested in a scientific and/or logical manner.

Now that you have finished the first chapter, we think that you are ready for more. All of the major topics and themes introduced in this chapter are elaborated upon in the rest of the book. In the next chapter, we focus on the anatomy and physiology of the hearing mechanism.

Chapter Questions

Note: Some answers to the questions can be found in the chapter; however, others have a variety of possible responses based on the students’ backgrounds and experiences.

1. What do you think is the significance of Davis and Silverman’s passage at the beginning of the chapter? Does this passage provide a perspective on the question “What is deafness”? Do you think there is a God’s-eye view (an all-encompassing description) of deafness that would satisfy all professionals? Why or why not?

2. List and describe, briefly, the two major views of deafness.

3. From this chapter, can you glean the authors’ purpose for writing this text? Do you or your instructor agree with the need for current and preservice professionals to be more knowledgeable in these areas? Is this really a problem?

4. Describe, briefly, the five categories of hearing loss. What are the two most important factors in the audiologic description of deafness? Do you think it is important to be aware of these categories? Why or why not?
5. According to the authors, why are speech and hearing important? Can you relate this to the development of English literacy skills? Was the connection between hearing and speech and reading new for you?

6. In this chapter, we mentioned that phonology represents the building blocks of a language. What does this mean?

7. Select and describe three major concepts that are discussed in this text.

8. How would you describe the authors’ framework for discussing the contributions of speech and hearing to the development of English? Is this similar to or different from your own mental framework? How is it similar or different?

9. If you had an opportunity to converse with the authors, what burning questions would you ask them? Share and discuss these questions with your instructor and classmates.

**Challenge Questions**

Note: Complete answers are not in the text. Additional research/reading is required. In some cases, reading further or elsewhere in the text might provide some information to guide a response to a particular question.

1. The authors mention that phonology represents the building blocks of any language. Does this mean that this can serve as the litmus test for all invented language/communication systems for d/Deaf and hard of hearing students (e.g., signed English; signing exact English; seeing essential English; cued speech/language, etc.)?

2. What are your current views on cochlear implants? Can you support your views with theoretical and/or research data? Do you think that advances in technology such as digital hearing aids or cochlear implants will eradicate the Deaf culture? Why or why not? Should d/Deaf children (younger than age 18) of hearing parents have the opportunity to benefit from such technology? Why or why not? Who should make this decision? [Note: We will ask this question or a related question a couple of times in this text!]

3. It has often been remarked that “there is no God’s-eye view of deafness.” What does this statement mean? Do you agree or disagree? Why? Do you think that this statement applies to all aspects of deafness, for example, the development of speech, hearing, language and literacy development, and so on? Why or why not?

**Suggested Activities**

1. If possible, plan a visit to the following locations:
   - A residential school for d/Deaf or hard of hearing students
   - Special classes in a public school for d/Deaf or hard of hearing students
   - A speech and hearing clinic
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For the school placements, list the similarities and differences with respect to communication methods, instructional techniques, and approaches for developing speech, language, and hearing skills. Interview a few teachers and a few clinicians (in the speech and hearing clinic). Ask about their views on the development of speech, language, and hearing skills. Share your findings with your instructor and the rest of your class.

Make a list of the major journals in deaf education, Deaf studies, and speech and hearing science. Select a few recent journal issues and list the range of topics discussed in these publications. How many of the articles (i.e., what percentage) are related to the development of speech, language, or literacy skills? Share your findings with your instructor and the rest of your class.

References


Further Readings


Further Readings


