



COMMUNICATION

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Introduction

Hearing loss affects a student's ability to communicate. There are many different approaches to and opinions about how students who are Deaf or hard of hearing (DHH) should communicate, but everyone agrees that early language acquisition, whether that language is spoken or signed, is the most important factor for learning and success.

During the critical stages of language development (from birth to five years of age), children pass through natural stages of language acquisition that do not occur in isolation, but that parallel development in the areas of cognition and socialization. Language acquisition, cognitive development, and socialization together form the organizational framework for the child's developing communicative competence (Roth and Spekman). For many students who are DHH, this process is hindered, which has an impact on learning potential because language is the tool we use for thinking and learning in social, academic, and other communicative situations.

What Is Language?

Most people communicate through spoken language, so there may be an assumption that these two things—speech and language—are the same, but they are not.

Speech involves production of vocal sounds to form distinctive words. It requires the coordination of the articulators (lips, tongue, teeth, and soft palate) and use of voice (Boston Center for Deaf and Hard of Hearing Children). A baby babbling is an example of speech sounds without language—there is no meaning.

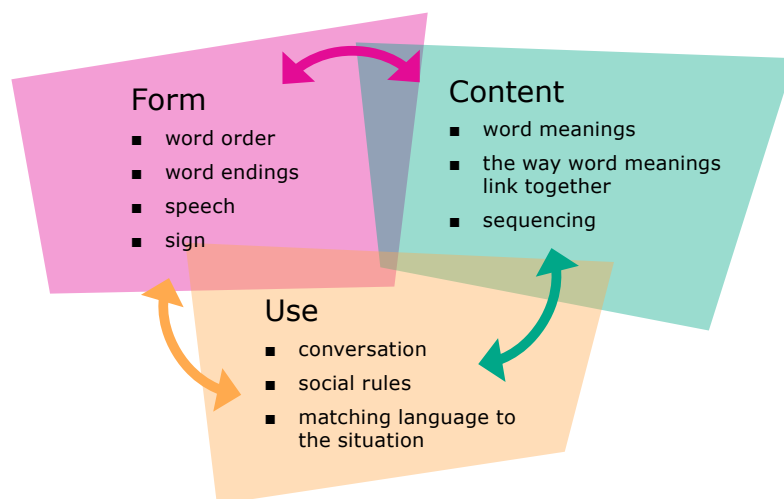
Language is a rule-governed set of symbols that is shared among people within a culture or a community. Language can be communicated through vocal/spoken words, through symbolic and meaningful visual/manual signs, and through written form (Boston Center for Deaf and Hard of Hearing Children). When we read and write, we are using language but not speech. Using signed language is another example of language that happens without speech. The signs connect to ideas or thoughts and help people to understand the world and other people.

As stated by the Boston Center for Deaf and Hard of Hearing Children, “**receptive language** refers to how an individual understands language” (e.g., comprehends questions, statements, stories), and “**expressive language** refers to how an individual uses language (e.g., communicates needs, shares ideas, requests information, asks questions, expresses thoughts or feelings)” (11).

The chart below shows how the areas of receptive/expressive language relate:

Figure 11

Receptive/Expressive Language



Reference: Bloom, Lois, and Margaret Lahey. *Language Development and Language Disorders*. Wiley, 1978.

“Language is created in the same areas of the brain regardless whether a person speaks English or uses American Sign Language to communicate, new results found” (Moskowitz).

How We Learn Language

In order to develop a language, children require continuous exposure to that language, and rich, repeated, and meaningful interactions with conversational partners throughout the day. Various language areas in the child’s brain process the information received and begin to attach meaning to the language patterns perceived, whether they are spoken or signed language patterns. In this way, language skills are developed. This is a very complex process.

There is a critical language learning period from birth to age five during which language learning is typically effortless and the brain is primed to form neural connections upon which language is processed and understood. After age five, this brain development slows down, neural connections are deleted if not used, and the development of language becomes more difficult. Lack of access or exposure to early language learning experiences may result in significant delays.

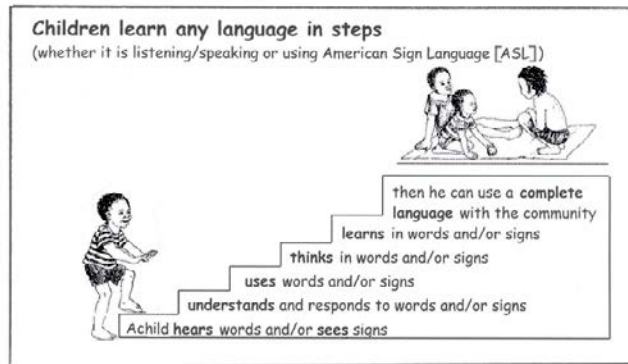
For young children to develop spoken language, it is important to provide them with auditory access through amplification and intensive spoken language exposure as early as possible. Children whose hearing loss is identified in infancy will have an easier time developing listening and spoken language skills than a child whose loss is identified later.

In the same way, for young children to develop ASL, it is important to provide them with visual access and intensive ASL exposure as early as possible. The later a child’s hearing loss is identified and the later the exposure to language input, the more difficult it will be to develop understanding and use of ASL.

Children learn any language (whether it is listening/speaking or using ASL) in steps.

Figure 12

Language in Steps



Source: Niemann, Sandy, Devorah Greenstein, and Darlena David. “Chapter 2: Children who cannot hear well need help early—Learning Language.” *Helping Children Who Are Deaf: Family and Community Support for Children Who Do Not Hear Well*. Illus. Heidi Broner. Berkeley, CA: The Hesperian Health Guides, 2014. 1. http://en.hesperian.org/hhg/Helping_Children_Who_Are_Deaf:Learning_language. Adapted with permission.



Language is essential for cognitive development.

The Importance of Language

“The need for and right to communication and language is fundamental to the human condition. Without communication, an individual cannot become an effective and productive adult The importance of communication and language for [D]eaf and hard-of-hearing children is so basic as to be beyond debate.” (Siegel 258)

Language allows us to attach words to objects and concepts and to develop our minds. It helps us to understand our experiences and how the world around us works. It allows us to talk to ourselves and think, to make our needs and wants known, to interact with others, and to be part of a community. Language enables us to make comparisons, to sequence and plan, to understand explanations, to manipulate ideas, to reason, to make judgments, and to understand that others may have different points of view. Language allows us to develop a theory of mind, to learn academics, and to effectively function in our world.

Some parents of children who are DHH are satisfied if their child learns some basic communication skills, but in order to be successful, children need to develop comprehensive language skills.

Figure 13

Staying Away From Danger



Source: Niemann, Sandy, Devorah Greenstein, and Darlena David. “Chapter 2: Children who cannot hear well need help early—Learning Language.” *Helping Children Who Are Deaf: Family and Community Support for Children Who Do Not Hear Well*. Illus. Heidi Broner. Berkeley, CA: The Hesperian Health Guides, 2014. 3. http://en.hesperian.org/hhg/Helping_Children_Who_Are_Deaf:Learning_language. Reproduced with permission.

Without language, a child will not be able to understand why the well in the picture above must be covered. He will not be able to understand his father’s explanation that the cover is there for his safety. The child may go through his day not understanding why certain things occur or why they are done a certain way. This lack of language and understanding can cause the child to feel confusion, uncertainty, fear, and isolation. Comprehensive language skills would allow the child to make sense of his world.

Communication Continuum

Students who are DHH may learn to communicate through

- listening/speaking
- ASL
- sign supported speech (SSS)
- augmentative/alternative communication (AAC)

The following chart demonstrates how students may differ in their use of visual and auditory information. Student communication needs may be used to steer recommendations regarding language and communication approaches and strategies.

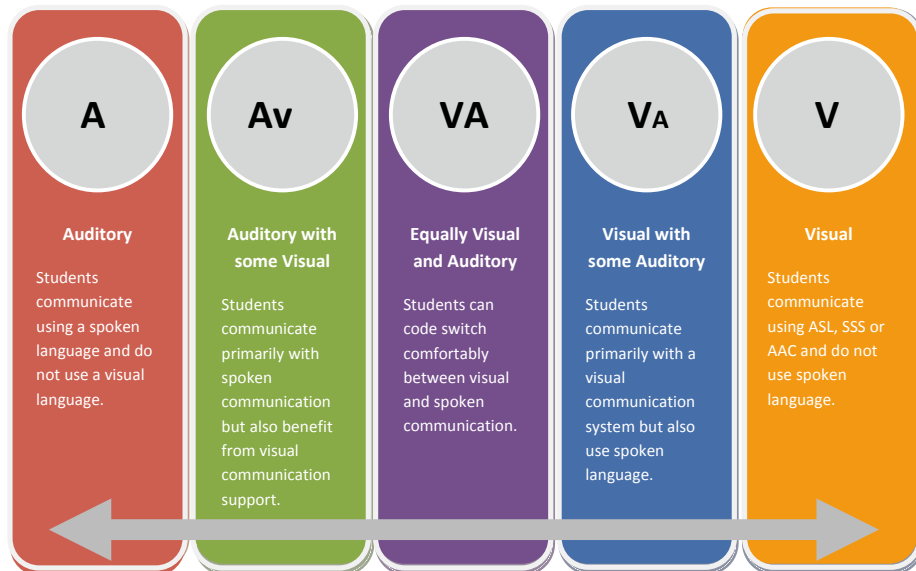
sign supported speech (SSS)

is when some degree of sign is used as a support to spoken language. SSS may also be used as a bridge to develop spoken language.

See page 45 for a definition and further information on AAC.

Figure 14

Communication Continuum



Students may move from one communication approach, depending on their needs/skills, to another, and the approach may change over time (e.g. from one year to the next). Also, the approach may vary, depending on the communication situation. For example, the student may

- express their ideas verbally, but use ASL to receive information
- sign or speak, depending on the communication approach of their conversational partner
- require visual language support, depending on the noise level of the environment or the number of people speaking

The student's ability to receive information (receptive language) and share information (expressive language) may differ. For example, a student may readily understand spoken language, but have complicating factors (e.g., progressive hearing loss, auditory neuropathy, apraxia) that may limit his or her effective use of speech.

Another student, on the other hand, may be able to speak clearly and fluently, but may not understand the information without visual cues or sign language.



A one-size-fits-all approach will not meet the needs of all children with hearing loss. A combination of language and communication approaches may be employed and modified over time as the student's language skills evolve (Nussbaum and Scott). It is valuable to consider a child's access to language in all environments.

Listening and Spoken Language Approaches

Advances in newborn hearing screening, hearing technologies, early intervention programs, and the knowledge and skills of professionals all contribute to the development of listening and spoken language skills in children who are DHH. The two main listening and spoken language approaches are the auditory-oral (AO) approach and the auditory-verbal (AV) approach. These approaches have more similarities than differences as they both focus on the development of spoken language. Both approaches emphasize the use of residual hearing through the use of hearing aids/CIs, and focus on the development of spoken language through listening. In the AO approach, students may also use visual cues (speechreading, gestures) to assist with comprehension. In the AV approach, there is an intensive focus on using listening skills throughout the day, without the use of visual cues. The AV approach involves rigorous application of techniques, strategies, and procedures, with family participation as an integral part of the therapy process.

Listening and spoken language approaches stimulate auditory brain development and allow children to attach meaning to what they hear. Auditory input that is relevant and significant makes it possible for children to recognize and comprehend sound.

We use our hearing in many ways—to comprehend the speech of others, to monitor our own speech, and to monitor the surrounding environment. Many factors affect a child's ability to learn through

"[T]he choice of a cochlear implant is usually associated with the choice of spoken language as the primary communication mode of the deaf child and family."
(American Speech-Language-Hearing Association 20)



As verbal language develops through the auditory input of information, reading skills can also develop.

Listening and Spoken Language Specialists (LSLS)

are “licensed speech-language pathologists, audiologists, or educators of the deaf who have become specialists in supporting children who are deaf or hard of hearing develop spoken language and literacy primarily through listening.”

(Alexander Graham Bell Association for the Deaf and Hard of Hearing)



Are ASL and English related?

ASL has regional variations in the signs used. For accuracy, consult *The Canadian Dictionary of ASL* or your educational interpreting consultant.

listening. Children, however, benefit most when parents and professionals collaborate to build the foundations of learning through listening by doing the following:

- Ensure that hearing aids/CIs are functioning optimally. Troubleshoot hearing aids/CIs on a daily basis.
- Use clear, well-articulated speech.
- Reduce environmental noise.

Auditory (listening) skills can be integrated into play, daily routines, and other meaningful activities.

The four main stages of listening are detection, discrimination, identification, and comprehension. The stages are sequential and can overlap. Please see page 50 (Auditory Training) for a detailed explanation of the stages of listening and auditory skill development.

Certain children, such as those who were diagnosed late, those who just received a hearing aid or whose CI has just been activated, or those who received amplification late, benefit from focusing on specific listening activities that are integrated into other meaningful activities. The idea is that in a one-on-one quiet setting, the child has successful experiences in listening alone. This will help the child in everyday noisy classroom environments (where there is speech in noise, speech at a distance, or muffled or mumbled speech) make optimal use of auditory cues in combination with visual cues.

Some students may have a hearing loss that was not identified during the critical language learning period (from birth to 5 years of age). For these students, developing listening skills may become a major challenge, as the auditory pathways in the brain did not receive adequate stimulation. Although amplification may help these students to hear sounds, they may struggle to make meaning out of the auditory signals. These students may benefit from visual supports or a visual language to access communication.

American Sign Language (ASL)

American Sign Language (ASL) is not English expressed through hand movements. Rather, ASL

- is a **native language**—ASL is the primary language that people from the Deaf community in Canada and the USA use to communicate. There is a regional dialect of ASL used in the Manitoba Deaf community. Langue des Signes Québécoise (LSQ) is used in Francophone communities. Students develop ASL skills through exposure to native ASL users (e.g., Deaf adults who are fluent in ASL). ASL is valued by the Deaf community.

Research indicates that children exposed to ASL from a young age, through interactions with fluent users of ASL, develop language in the same manner as children acquiring a spoken language.

Children who are Deaf born to parents who are Deaf acquire their first language (ASL) in a normal developmental way.

For detailed information about ASL grammar, visit the ASL University website at www.lifeprint.com/asl101/ (Vicars).

Metalinguistic knowledge

is the ability to think about and comment on language.

- is a **visual language**—ASL has distinctive components including handshapes, orientation, location, and movement to express ideas and concepts. It is different from spoken languages in that it has no written form.
- has a **unique grammar**—ASL is a complete language with its own structure and rules, its own grammar and syntax. It includes all the components found in recognized languages including morphology, phonology, verb agreement, classifiers, semantics, and pragmatics. It also combines grammatical components that are distinctive to signed languages across the world, such as non-manual markers, manual markers, handshapes, and facial expression.

Some people who are DHH consider English to be their primary language and use varying amounts of sign to support their understanding of speech. In these cases, signs are typically used in English word order. This would be considered using sign supported speech rather than ASL.

Language Acquisition

Research has shown that early language exposure is essential to normal development of any language, including ASL. Students require consistent exposure to skilled ASL language models in order to develop language, academic, and social skills. Lack of exposure may result in significant delays in each of these areas.

Only four percent of children who are Deaf are born to signing parents who are Deaf. The majority of children who are Deaf are born to hearing parents who have little or no exposure to ASL. As these families struggle to deal with this new situation, the child's exposure to language is often limited, delaying language development. In these cases, ASL is often introduced later in childhood (Mitchell and Karchmer).

Fluency in a language typically takes an average hearing student seven years; therefore, a signing student may only be emerging in their first language when entering school.

English as an Additional Language (EAL) for ASL Students

In the course of learning one language (ASL), a student acquires a set of skills and **metalinguistic knowledge** that can be drawn upon when working in another language (English). Conceptual knowledge developed in ASL helps to make input in English comprehensible.

For example, if the student already understands the concept of feelings or honesty in one language, all they have to do is acquire the label for these terms in English (written or spoken). They have a far more difficult

task if they have to acquire both the label and the concept in the second language.

Often a focus on developing a student's ASL skills (e.g., vocabulary, grammar) and world knowledge is important in assisting the development of English language skills.

Information about supporting the development of English as an additional language in the classroom is available on page 80 of the Education section.

"One observation seems equally sure: Being exposed to two languages from birth, by itself, does not cause delay and confusion to the normal processes of human language acquisition." (Petitto et. al, qtd. in Nussbaum 56)

Augmentative and Alternative Communication (AAC)

Students who are DHH may require an augmentative and/or alternative communication system (AAC) to support their use of speech/ASL.

Augmentative communication refers to the use of aids or techniques that supplement an individual's existing verbal or ASL communication skills.

Alternative communication refers to the method used by an individual who cannot effectively use vocal ability to communicate.

An AAC system

- helps students with little or no speech to communicate
- provides the student with appropriate, efficient, and effective means to communicate with a wide range of partners in a variety of contexts
- may be provided for students to express their wants, needs, and ideas, and to engage in social interactions

An *unaided* AAC system can include the following:

- gestures
- signs
- body language

An *aided* AAC system can include the following:

- real objects
- photographs
- communication book with picture symbols



Use of keyword signing simultaneously with speech would be an example of an unaided AAC system.

- speech-generating device
- tablets or laptops with programs that assist the student in communicating

The student’s AAC system and strategies are individualized for their learning and communication needs. The development of an AAC system is a team process. Information and support from the parents, the school team, and other professionals (e.g., TDHH, SLP, AV therapist, occupational therapist, audiologist) are needed to provide a complete assessment and plan for the student’s communication needs and abilities.

The student’s team will need to identify the level of symbolic functioning (e.g., real objects, photographs, picture communication systems, written language) to be used to facilitate the development of language, be it ASL or English.

Research indicates that the use of AAC supports spoken language, and possibly ASL, by increasing social interactions and language skills.

Information about supporting the use of AAC in the classroom is available on page 80 of the Education section.

Language and Learning

Literacy

is the ability to read, write, communicate, and comprehend. (Education Oasis)

Language provides an important foundation for **literacy** and learning skills for all students. The relationship between language and learning can be illustrated in a hierarchy, as in the figure that follows.

Figure 15

Language and Literacy Hierarchy*



* Source: Robertson, Shari. "Read with Me! Stress-Free Strategies for Building Language and Pre-literacy Skills." Canadian Association of Speech-Language Pathologists and Audiologists (CASLPA) Annual Conference. Winnipeg, MB. 3–6 May 2006. Available online at http://student.plattsburgh.edu/derm2044/robertson_readwithme.pdf. Adapted with permission.

- The bottom block represents all the words or signs that the student can understand (receptive language), and it is the largest.
- Only a portion of these words make up the ones the student can speak or sign (expressive language).
- Again, only a portion of those expressive words will be the ones the student can read (receptive written language), and even less will be part of their writing (expressive written language).
- As the top block indicates, only a small portion of the student's receptive language is brought to the task of learning in other content areas (science, math, social studies, and so on).

If the student's receptive language base is limited, all other areas of language and literacy learning may be affected, including reading, writing, and other classroom learning.

Each level does not need to be taught separately. An integrated approach should be taken to developing reading, writing, and learning in the classroom, always considering the student's background knowledge and skills.

In cases where a student's receptive language skills are limited, the curriculum needs to be adapted to the student's level of understanding.

Assessments in language, concepts, phonological awareness, and so on, conducted by the SLP, TDHH, and AV therapist, help in targeting goals for the IEP.

Phonological awareness

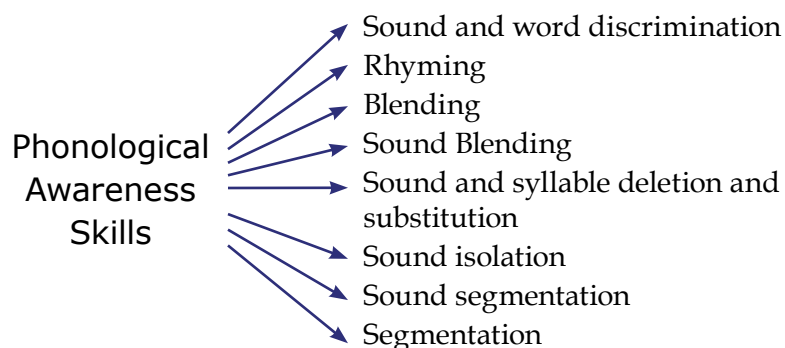
is the ability to hear and manipulate the sound structure of language.



See Appendix D for a developmental list of phonological skills.

Phonological Awareness—Spoken English

Phonological awareness is a listening task that requires an individual to manipulate speech within sentences, words, syllables, or sounds. Phonological awareness activities include rhyming, identification of sounds within words, and segmenting/blending sounds. These skills emerge in preschool and continue to develop through the early school years. Phonological awareness is directly linked to success in early reading and spelling. Students who are DHH may experience some difficulty with various phonological awareness tasks as they may not clearly hear all of the speech sounds.



Phonological Awareness—ASL

ASL also has its own phonology, looking at the smallest building blocks of language that are used to create signs. Each sign consists of five basic parts called **parameters**. These are as follows:

- handshape—the shape of the hand
- movement—how the hand moves
- location—where the sign is made on the body or in the air
- palm orientation—the orientation of the hand or palm as the sign is made
- non-manual signal/marker—facial expressions and/or head/body shifts made as part of the sign

Each of these parameters has a variety of aspects called primes. For example, there are over 40 different handshapes or primes in the handshape parameter.

A change in one parameter of a sign alters the meaning of the sign or makes it meaningless (i.e., a movement that is not a true sign). For example, the words *apple* and *onion* in ASL have the same handshape, movement, and palm orientation, but are signed in different locations, which results in a different meaning.

Students learning ASL must learn to manipulate these parameters to understand and create different signs, just as children learn to manipulate sound in spoken English.

Grammar Acquisition—English

English grammar structures are a challenge for many students who are DHH. If the student has a functional and well developed first language (such as English or ASL), the difficulties may be somewhat lessened, but grammar will still typically remain a challenge for the majority of students with a hearing loss.

Students need to develop knowledge and understanding of

- how words are formed (**morphology**)—for example, *cat's*, *baked*, *cooking*
- the meaning of words (**semantics**)
- the set of rules used to string words together to form phrases, clauses, and sentences (**syntax**)

Morphemes

are meaningful parts of words (e.g., suffixes, roots, prefixes).

Semantics

is the aspect of language concerned with meaning.

Syntax

is the set of rules for combining words into phrases, clauses, and sentences (eg., noun-verb agreement).

Incidental language learning

occurs when students learn words without direct instruction.



Students with hearing loss tend to be stronger semantically than syntactically.

Hearing students learn English grammar through exposure to other people's comments and conversations—this is called **incidental learning**. More than 90 percent of our language learning occurs incidentally. Basic grammar skills are usually well developed by midway through elementary school and the finer points are taught in the later grades.

Many students who are DHH, however, have limited access to incidental learning and thus limited exposure to English grammar. In addition, they may

- not have access to high frequency sounds (cannot hear the /s/ in plurals, possessives, and verbs)
- have difficulty with speech perception skills—speech sounds are not clear or they may not understand the grammatical structures (lengthy or complex sentences)

As a result, they may experience significant language delays and/or have gaps in their knowledge of various language structures and rules. They will require direct, explicit instruction and practice on specific grammar skills (e.g., using past tense verbs) to build their communication competence. Once the basic skills are developed, the student can scaffold or build on those skills to learn structures that are more complex. Consult the SLP, TDHH, or AV therapist involved with the student for specific grammar goals to include in the individual education plan (IEP).

Typical areas of concern for students who are DHH include the following:

- plurals—regular and irregular (e.g., cat/cats, mouse/mice)
- possessives (e.g., Mom's hat)
- third person singular (e.g., he wants; she reads)
- copula (or *to be*) verb (e.g., She *is* smart.)
- present progressive tense (*be + ing*) verb (e.g., He *is* running.)
- subject/verb agreement (e.g., *He is* running. *We are* running. *She has* a book. *We have* a book.)
- past tense—regular and irregular (e.g., They *walked* to school. They *ran* to school.)
- article and pronoun use (e.g., *That is her* book.)

Difficulties in these areas are often reflected in the student's comprehension and expression of language (written and spoken).

Repeated exposure and opportunities to practise new skills in a variety of contexts are crucial. Opportunities to apply new skills through exposure to a wide variety of literature are also important.

Students who are DHH may learn English grammar through speaking/listening or through reading/writing only, depending on the degree of residual hearing, the communication approach used, and/or individual learning styles.

More information on strategies for helping students to acquire English grammar is available in the Education section on pages 83 to 85 and 95 to 96.

Grammar Acquisition—ASL

Students using ASL need to develop a knowledge and understanding of

- how signs are formed (morphemes and phonology)
- the meaning of signs (semantics)
- the set of rules used to string signs together to form phrases, clauses, and sentences (syntax)

Students need exposure to good ASL language models and direct instruction to develop these skills. Often in schools, the only person with whom they can sign is their interpreter. If they receive support from a signer with limited skills, their ASL exposure and development may be severely limited in school.

Students need opportunities to meet and interact with DHH peers and adults to increase their exposure to ASL and to enrich their own language skills. This can occur through links with other signing students in the school or in other schools in the division, regional social gatherings of students who are DHH, and participation in Deaf community events. Contact your TDHH for information on these types of opportunities.

Students can also benefit from support from the ASL/education consultant from Manitoba Education.

More information on strategies for helping students to acquire ASL grammar skills is available on pages 81 and 103, and by consulting the Manitoba Education ASL/education consultant and the TDHH.

Development of Communication Skills

Students with hearing loss may benefit from intensive instruction in auditory skills, which helps them to learn to listen and interpret what they hear through their hearing aids/CIs. With specialized, intensive language instruction, many of these children can learn to listen and speak effectively. This instruction could be in the areas of auditory training and speech therapy (articulation, oral motor therapy, and vocal quality). In addition, students may demonstrate skills in speechreading.

Auditory Training

Students with hearing losses ranging from mild to profound may benefit from auditory training. The degree to which a student who is hard

of hearing can develop his or her auditory (listening) skills will vary, depending on a variety of factors, including the following:

- residual hearing
- age of onset
- age of diagnosis
- age of intervention
- use of appropriate amplification
- environment for listening (quiet, acoustically sound)
- exposure to a variety of speech and environmental sounds and experiences
- desire to develop auditory skills
- cognitive ability

Auditory training involves developing skills in the following areas:

- detection/awareness of sound: responding to the presence or absence of sounds
- discrimination: perceiving similarities and differences between sounds
- identification: naming/pointing/drawing/writing to indicate the source of a given sound, imitating a given speech sound
- localization: identifying the direction of the sound source
- phonetic listening: discriminating the supra-segmental aspects of speech (pitch, duration, loudness); discriminating sets of words varying in difficulty from phonetically dissimilar words (e.g., *ball*, *elephant*) to phonetically similar words (e.g., *tap*, *tack*)
- auditory comprehension: understanding the meaning of sounds (e.g., ringing phone means someone is calling) and showing an understanding of speech by answering questions, following instructions, recalling information, conversing, sequencing information, and identifying absurdities
- auditory memory: recalling what was heard, recalling longer and more complex messages
- critical listening: listening for critical information in the presence of background noise at various distances from the speaker

When planning for daily auditory training, it is essential to establish a quiet setting, with a minimum of extraneous noise and distractions. Development of the student's listening skills are emphasized; therefore, it is beneficial to minimize speechreading cues during auditory training sessions. The consistent use of appropriate amplification is essential for auditory training. Goals in the areas of language, vocabulary, and basic concepts can be reinforced during auditory training sessions.

For strategies to develop students' auditory skills, see the Education section, page 82.

Speech Therapy

Speech therapy can include work on articulation, oral motor therapy, and work on vocal quality.

Articulation

Students who are DHH, depending on the degree and type of hearing loss, may have articulation or speech sound errors. Misarticulations are characterized by difficulty in producing speech sounds correctly. Common speech sound difficulties for students with hearing loss may include

- omissions (e.g., *-kool* for *school*)
- substitutions (e.g., *but* for *bus*)
- distortions (e.g., *shair* for *chair*)

A high-frequency hearing loss is the most common type of hearing loss. Students with a high-frequency hearing loss may experience difficulty hearing and producing high-pitched sounds, including /s/, /th/, /f/, and /sh/ (Doyle and Dye 8).

The /s/ phoneme is the most frequently occurring speech sound in the English language and also carries the most meaning. The /s/ and /z/ speech sounds are grammatical markers for plurals (e.g., *cat/cats*), possessives (e.g., *mom/mom's*), and verb tenses (e.g., *run/runs*). Not hearing these sounds may affect the intelligibility of a student's speech, depending on the hearing loss and the benefit the student receives from amplification.

Hearing loss/articulation difficulties may be reflected in the following areas of classroom learning:

- oral expression
- written expression
 - spelling
 - grammatical structures
 - editing

An SLP will assess a student's speech sound production. Speech sound intervention may include direct therapy by the SLP, indirect therapy, and/or a home program.

For classroom strategies to support accurate speech production, see page 82 of the Education section.

A student's articulation difficulties will impact their speech intelligibility.

Some students who are DHH may not have enough residual hearing to develop intelligible spoken language.

Hearing test results alone cannot predict success in developing spoken language.

With the improved sound of hearing aids and cochlear implants, it may be easier for students to monitor their own voice quality.

Oral Motor Therapy

In conjunction with speech therapy, oral motor therapy may be used as a warm-up for the speech mechanism, increasing oral muscle strength, control, and range of motion. The SLP can assist in determining the need for oral motor therapy.

Oral motor approaches may be used

- with young non-verbal (and in extreme cases, non-vocal) students to develop the basic foundations of speech (e.g., an oral airstream, basic laryngeal (throat) movement on an airstream, tongue movement, lip shaping)
- in promoting speech sounds, when students are unable to imitate or follow verbal instructions to produce particular sounds, even at a single sound level. Muscle control for producing an individual vowel or consonant sound (e.g., lip rounding for vowels, placement of tongue for specific consonants) may be practised and then incorporated into speech. (Williams, Stephens, and Connery)

Strategies to use with students who are DHH and who appear to be having difficulty acquiring speech are available on page 82 of the Education section.

Vocal Quality

Voice problems related to hearing loss vary considerably according to the type and degree of hearing loss. The more significant the hearing loss, the more likely that the student will have vocal quality issues.

Students who are DHH may not receive adequate auditory feedback to monitor their own voices. A vocal quality problem may interfere with the intelligibility of a student's speech.

Vocal quality difficulties may occur in the following areas:

- **Timing, Rhythm, and Phrasing (word emphasis, pauses):** Since the rhythm of English is especially stress-oriented, these dimensions are extremely important for speech intelligibility.
- **Intensity (volume):** Intensity problems can range from too loud to too soft, or there may be erratic changes in loudness levels. Students who are DHH may use a loud voice in a noisy classroom so they can hear themselves speak.
- **Pitch and Intonation:** Pitch and intonation may vary from insufficient pitch change, which may result in a monotone voice, to excessive or erratic pitch. The excessive variation may result from attempts by the student to increase the amount of feedback they are receiving from the activity of producing speech.

Appropriate pitch may be difficult to master because the student may not have a conceptual appreciation of what pitch is. Hearing people describe pitch in terms of high and low. Students who are Deaf may not have the same opportunity to learn by hearing high and low in the auditory domain. This is why a student who is Deaf may attempt to raise the pitch by increasing the loudness level of his or her voice.

- Resonance (hyper-nasality, hypo-nasality): Hearing individuals subconsciously learn to adjust resonance through the auditory channel and through trial and error. An individual who is Deaf may not have access to the auditory information required to develop appropriate resonance.

Atypical resonance in some individuals who have a hearing loss can also be the result of structural abnormalities (e.g., cleft palate, syndromes).

The SLP will diagnose specific problems in these areas and may give recommendations to promote their development.

Speechreading

Speechreading was previously known as lip-reading, but now encompasses lip movement and facial expression. Speechreading provides some information when used in conjunction with residual hearing, amplification, and other strategies that assist in communication for a student with hearing loss.

Identifying speech sounds on the lips is not a reliable means of communication when used in isolation, as only 33 percent of speech sounds are visible on the lips (e.g., /b/, /m/, /l/); the rest are not visible (e.g., /k/, /g/, /ng/). The speechreadability of words will vary within the sentence, due to the words or sounds that come before and after the word. It is also easier to speechread when the context of the conversation is known.

Misunderstandings occur when speechreading. Factors that may affect the student's ability to speechread for information include

- prior knowledge of the content
- predictability of the message
- familiarity with the vocabulary used
- the speaker's rate of speech
- visibility of the speaker's face (e.g., whether the speaker is face on or turned away, or in shadow, or whether there is a distracting background)
- distractions such as gum chewing, eating, a moustache

Speechreading for information is a skill that may develop over time, as the individual grows in knowledge, reasoning, and language skills.

Language Knowledge and Skills Needed in the Classroom

All students need certain knowledge and skills to be successful in school. These include the following:

- vocabulary
- concepts
- following directions
- wh- questions
- storytelling
- Theory of Mind
- critical thinking
- executive functioning
- social skills

Vocabulary

Vocabulary is one of the essential components of language development and reading skills acquisition. Many students, including those who are DHH, have poorly developed vocabulary in both spoken and written language.

It is estimated that the average student hears approximately 30 000 words per day. A student who is DHH may not have access to many of those words. We cannot, therefore, assume that students who are DHH will learn language, including vocabulary, incidentally.

Learning Vocabulary

For the purposes of learning vocabulary, various groupings can be used:

- Association (how things go together)
- Function (what items are used for)
- Categories (name for a group of items that belong together)
- Attributes (descriptors)
- Comparisons (how items are the same/different)
- Synonyms (words that mean the same thing)
- Antonyms (opposites)
- Definition (how to define the word)
- Exclusion (how an item does not belong)
- Multiple-meaning words (words that have more than one meaning)

Classroom Connections

Students who are DHH may

- have a limited vocabulary



Children with hearing loss may struggle with vocabulary learning because they may not be acquiring new words incidentally.

Students may need to be taught explicitly and intentionally using specific word instruction, word-learning strategies, repetition, and active engagement.



It is important to teach multiple meanings of words to build comprehension.



Students will increase their vocabulary skills if they have a wide range of experiences, sufficient number of exposures to the words, active engagement, consistent direct instruction, and useful word-learning strategies.



Understanding of these concepts is essential for classroom success and is necessary for performing everyday classroom activities such as reading, writing, arithmetic, listening, and speaking.

- not have made the associations that certain items go together and why
- be weak in identifying categories or in classification skills
- need vocabulary to be taught in multiple modalities (e.g., English print, ASL, spoken language)
- need vocabulary to be intentionally linked to whatever background knowledge may or may not exist (in which case background knowledge would need to be taught)
- need vocabulary and unfamiliar concepts to be pre-taught and reviewed
- need links made to similar items and need categories identified—in many cases, students have picked up words here and there and do not have anything to link these pieces of information to (linking vocabulary to a category and giving it a name will help students form concepts and vice versa)
- benefit from using graphic organizers such as semantic webs and maps
- need development of multiple-meaning words—students may learn a word in spoken language or English print and associate it with only the one meaning (this becomes especially difficult as language becomes more complex in the later years and directly affects comprehension and production of written and oral material)

Concepts

Basic concepts are the building blocks that students need to follow directions, engage in classroom routines, and provide descriptions. Acquisition of concepts occurs in a developmental sequence.

Concepts include the following:

- Colours (e.g., red)
- Numbers/counting (e.g., 3)
- Letters (e.g., A)
- Size (e.g., big, short)
- Comparisons (e.g., same, different)
- Shapes (e.g., circle)
- Direction/position/location (e.g., on, behind, near, next to)
- Self-/social awareness (e.g., happy, mother, young)
- Texture/material (e.g., hot, smooth, clear)
- Quantity (e.g., many, enough, nothing)
- Time/sequence (e.g., night, next, before)

Concept development may be delayed in students who are DHH.

Classroom Connections

Students who are DHH do not necessarily develop concepts in sequential (developmental) order. They may have mastered higher-level concepts but have gaps in earlier concepts. Thorough assessment of all concepts may be necessary, and any gaps in development may need to be intentionally taught.

Hands-on experiences and the use of actual objects are a great way to teach concepts and can easily be integrated into any lesson. Presenting pictures and the words in print on the board also facilitates learning.

More suggested strategies to help students develop vocabulary and concepts are available on pages 83 and 84 of the Education section.

Following Directions

Following directions in a noisy classroom can be very challenging for a student who is DHH.

Following a direction involves hearing or seeing the message, understanding, and remembering a set of instructions presented in a specific order or sequence. A student who is DHH may not be able to follow a direction due to a breakdown in any one of the following areas:

- The student may not be able to hear the direction or may only hear part of it due to the noise level in the classroom or the distance the student is from the speaker. A student using sign language may not see the full signed message.
- The student may not understand the concepts, vocabulary, or the grammatical structures used in the direction.
- The student may not be at the developmental listening level to remember the number or sequence of directions.

Classroom Connections

Strategies that a teacher can incorporate on a daily basis in the classroom setting to aid a student who is DHH are available on page 85 in the Education section.

Wh- Questions

Understanding and responding to wh- questions is a complex language task. Frequently, students who are DHH have difficulty with wh- questions, especially if they are not familiar with the topic.



Please refer to Appendix E for a hierarchy of question forms.

Understanding is improved if the question concerns

- an item that is concrete/visual in the room (e.g., “Who is that girl?”)
- a topic that they have experienced directly (e.g., fishing) and that has affected them

Wh- questions vary in complexity. From simplest to hardest the basic question forms are

- Who?
- What?
- Where?
- When?
- How?
- Why?
- Negative why?

Classroom Connections

The “why” questions require abstract reasoning skills and are crucial for success in the classroom, specifically for following directions and instructions. The most difficult wh- questions (e.g., Why? How?) are also the most frequently used in the classroom setting. Cognitive and/or language issues and the lack of an experiential base play a large role in this area of difficulty.

Strategies to help students with wh- questions are available on page 85 of the Education section.

Storytelling

A story or narrative is an account of an experience or event that is sequenced in a particular order to convey meaning. Stories are an integral part of everyday life and are an important source of information about language and our world.

Students are constantly exposed to stories and expected to comprehend them in a variety of forms, including signed storybooks or oral stories, television, movies, and cartoons.

Students who are unable to understand stories may have difficulty reading, telling, or writing stories, or even difficulty recounting events that have happened.

The student who is DHH may be delayed in his or her understanding and use of narratives due to limitations in the following areas:

- vocabulary
- concept development
- grammatical language
- auditory memory
- overall background knowledge
- ability to grasp the main idea
- part-to-whole reasoning (e.g., how story components are interrelated)
- sequencing and time concepts

Due to limitations in language, the student may understand the action but not the underlying intentions or beliefs of a story, which will affect his or her ability to understand or retell the story.

For example, in the preschool story of Little Red Riding Hood, the story is much more than a tale of action in which Little Red Riding Hood is just taking food to her grandmother. The content of this story is related to the desires and beliefs of the characters.

Little Red Riding Hood has a false belief, in that she thinks that the wolf is her grandmother, but the reader or listeners know that the wolf is deceiving her and intends to eat her. The student must see beyond the mere action of the story and understand that Red Riding Hood does not know what the listener knows.

Classroom Connections

Strategies to promote understanding and use of narratives in the classroom are available on page 85 of the Education section.

Theory of Mind

Theory of Mind (ToM) is the ability to understand that what you think, feel, or believe may not be the same as what someone else thinks, feels, or believes. Skills in ToM allow one to recognize the thoughts and feelings of others; to understand, explain, predict, and influence how other people behave; to put oneself in another's shoes and see their perspective; to develop empathy for others; and to read social cues. ToM has been described as falling into four domains: cognitive, affective, interpersonal, and intrapersonal.

Typically, children begin exhibiting ToM skills at about age four with skills developing in a trajectory. By adulthood, a complex skill set of ToM allows people to make and maintain social relationships and manage everyday social situations.

“Effective and appropriate social communication/pragmatic language skills require a communicator to have a theory of mind.” (Westby and Robinson 362)



See Appendix F for Revised Bloom’s Taxonomy.

There is a strong connection between language and ToM. Children need exposure to and interaction in a language-rich environment in order for ToM skills to develop. They need opportunities to hear/see and participate in conversations that include different points of view, the use of mental-state terms (e.g., *know, believe, think, wonder, need, hope*), and a range of language structures.

For some students who are DHH, a lack of language exposure, the inconsistent use of amplification, difficult listening environments, and a lack of shared language in the home can result in limited exposure to these concepts and thus delays in skills. A lack of ToM skills can have a significant negative impact on social interactions and relationships and on pragmatic communication. People need to see other perspectives to effectively solve problems, negotiate, and consider the feelings of others in conversation and actions. A delay in ToM skills also has an impact on academic achievement, as these skills are involved in a wide variety of areas including reading comprehension, writing, and understanding the motivations of people (social studies, history, politics).

Classroom Connections

Strategies teachers can use to support the development of ToM are available on page 86 of the Education section.

Critical Thinking Skills

The development of age-appropriate critical thinking skills for students who are DHH is complicated because there is often an overlay of language difficulties.

Higher-level language abilities are often missing due to lack of experiential language which, in turn, has an impact on reasoning skills. Many of these students are concrete thinkers who need direct assistance to develop more abstract reasoning skills. Direct therapy to teach problem-solving constructs may be necessary.

Developmentally, a student needs to acquire the following skills:

- classification skills
- comparing and contrasting skills
- answering true/false questions
- making and explaining inferences
- identifying causes of events
- identifying problems and solutions

Students with a hearing loss may experience difficulties developing these skills.

Classification Skills

The ability to classify is a basic cognitive function that enables students to organize ideas, sequence them, and think about them logically. These skills are the foundation for all abstract thought.

Comparing and Contrasting Skills

The ability to sort objects into sets based on attributes and to be able to look at the similarities and differences between the sets develops with classification skills.

Answering True/False Questions

Answering true/false questions requires taking in information and questioning its validity.

Students need to assess information based upon their prior knowledge and newly acquired data. They need to evaluate information, form opinions, know the difference between opinion and fact, and be able to express their understanding.

Making and Explaining Inferences

Making and explaining inferences involves combining old information with new, evaluating what is important, and analyzing the results from this logical process. This is a high-level language ability.

Identifying Causes of Events

To identify the causes of events, students look at a situation and determine the probable cause from a number of options. This skill moves from the concrete through to a highly abstract reasoning ability and requires flexible thinking processes.

Identifying Problems and Solutions

The ability to identify problems and solutions can be actively taught as a process. An effective tool in teaching the process is the use of external frameworks or visuals such as the one in Appendix G.

Classroom Connections

Strategies teachers can use to develop critical thinking skills in each of these areas are available on page 87 of the Education section.



The teacher may need to provide a solid background in critical thinking skills to facilitate effective problem solving.

Executive Functioning

Executive functioning (EF) is a complex set of abilities/skills that work together to regulate and direct one's thinking, behaviour, and emotions in order to stay on task and achieve goals. It is a self-management process. EF skills include the following: planning, organizing, attending, sequencing, controlling mental effort, using working memory, self-monitoring, inhibition control, flexible thinking and problem solving, and juggling multiple tasks. EF abilities guide social behaviour and are thus linked to social cognition (Theory of Mind). Students need EF abilities in order to achieve success on higher-level cognitive tasks.

EF emerges in the first year of life and continues to develop through early adulthood with significant growth between ages 4 to 6. Complex language is needed to effectively carry out EF processes, and research shows there is a high correlation between language abilities and EF skills. Increasingly sophisticated language is required for EF development as a person matures.

Research shows that many students who are DHH have delays in EF skills due to a lack of language exposure and language skills. These delays can have a significant impact on their self-management, social interactions, and academic achievement.

Classroom Connections

Strategies teachers can use to promote the development of EF skills are available on page 89 of the Education section.

Social Skill Development for Students Who Are DHH

Students who are DHH may experience difficulties in the development of appropriate social skills.

The Significance of Incidental Language Learning

Many social skills are acquired in the hearing population through incidental learning. This means that hearing students learn social nuances in their everyday interactions by seeing and hearing others around them. These skills help them navigate the social world.

Students who are DHH may have limited access to this incidental learning, especially if they are in an environment where their primary mode of communication is different from that of their family and peers.

As families begin to deal with alternative forms of communication or adjust to their child's hearing loss, often communication is basic and directive (e.g., "Go to bed"; "Time to eat").



Students who are DHH may have difficulty with paying attention, taking turns, and making eye contact if they are struggling to understand a hearing world without clear expectations of how they are to behave.

Students who are DHH need exposure to interactive communication so that they become aware of the grammar and use of their language. This also helps students develop social skills.

Using Language

Use of language can be broken into several categories reflecting maturation and language development. These categories are

- pre-language skills
- pragmatics or the functions of language
- social skills

Pre-language Skills

Pre-language skills are behaviours that a student must acquire in order to adequately develop language. They include the following:

- making eye contact
- taking turns
- being able to focus on the same task as another person
- paying attention to things and people
- being able to imitate and use gestures and sounds
- playing appropriately with toys
- understanding cause and effect
- communicating with intent

Pragmatics or the Functions of Language

Pragmatics delineates how students use language to have an impact on the world around them. Pragmatics basically explains why a person communicates. These purposes include the following:

- making a request
- protesting about something
- greeting or saying goodbye
- responding to another person's communication
- asking for information
- thinking, planning, and problem solving
- sharing feelings, ideas, and interests

Students who lack pragmatic language skills may experience social awkwardness or difficulties, as they may not understand the rules, nuances, and language of social interaction with others. The student may be puzzled by confused or negative responses from peers and adults.

It should also be noted that if a student uses ASL, Deaf culture has its own expectations for social behaviour that may or may not be the same as hearing culture expectations. These need to be taken into account. Exposure to both systems of relating is recommended.

Social Skills

Social skills are the behaviours a student exhibits to survive in a social world. Grasp of social nuances is crucial as these students mature. These skills may include the following:

- social register (e.g., how a student addresses a teacher versus a peer)
- non-verbal conversational skills (e.g., body language, facial expression)
- ability to express opinion
- ability to express emotions
- conversational skills
- manners
- ability to resolve conflicts
- problem-solving skills

With higher-level social skills, the demand for language skills increases. Exposure to a variety of social situations is crucial for the student who is DHH to grasp the often subtle cues that influence social appropriateness.

Issues most often seen with the DHH population include poor problem-solving skills, difficulty with conversational skills, poor self-esteem, and difficulty with the higher-level language skills that go along with the social aspects of interaction.

