

It's a Noisy World! We CAN Improve Listening in Noise Ability



We listen in the presence of competing noise all the time, in places like sporting events, restaurants, large group settings, concerts, work/school, or family functions. Environmental noise, as well as competing background noise from people talking at the same time, creates a big challenge in which the desired speech may be the same loudness as the unwanted noise. The ability to listen in the presence of noise creates an access barrier, especially for students with hearing loss. This article will describe the challenges related to listening in noise, and strategies for teaching students to cope in these conditions.

Challenges

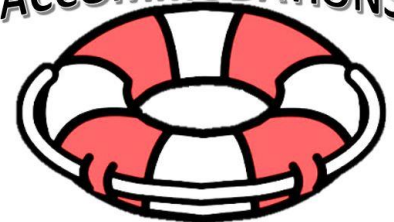
It's challenging to extract speech amid varying levels of unwanted noise. We use two ears together to localize sound and more easily locate the person speaking. Sound localization guides us where to focus our attention. Most students with hearing loss will have difficulty with sound localization thereby causing them confusion about who is speaking.

Trying to listen to speech when unwanted noise is present is a challenge both outdoors and indoors, especially in rooms where sound reverberates. High pitch voices, low pitch voices, fast speaking rates, accents – all can contribute to a listener's ability to differentiate the person speaking from the background noise or other people talking at the same time. Although newer hearing aids have the ability to scan environments and automatically adjust functions to compensate for the additional sounds, hearing aid users still report that background noise and environments with multiple people talking continue to be a significant challenge.

Improve Access

As a first step, provide accommodations in the classroom such as: reducing background noise, using personal Hearing Assistive Technology, and seating a student preferentially, (with 3-6 feet from the sound source). Even with accommodations it is unlikely that the student will be able to access information in noisy environments with the same comprehension level as their hearing peers. Training students to listen in a variety of settings should be incorporated into auditory learning goals and monitored frequently.

ACCOMMODATIONS



= Lifeline to Learning for Students with Hearing Loss

Get Baseline Data

The audiogram may provide some understanding of a student's ability to discriminate speech from information. Speech discrimination scores (SDS) and word recognition scores (WRS) yield information for speech presented in a quiet environment, and speech recognition thresholds (SRT) yield scores from phonetically balanced word lists, presented above an individual's hearing threshold. However, it's difficult for teachers of the deaf and hard-of-hearing, and speech-language pathologists to ascertain the child's ability to access speech, while in the presence of noise, simply from looking at a student's audiogram.

The handouts [Impact of Hearing Loss on Listening, Learning, and Social Interactions](#) use audiogram information to predict speech perception.

Evaluating the ability of students with hearing loss, to access, listen, and gain an understanding of what is being presented orally, in the midst of noise, can be difficult for teachers but *can* be accomplished, even in itinerant settings. It is strongly suggested that the [Functional Listening Evaluation Using Sentences](#), the [ELFLing](#) or the [Developmental Test of Auditory Perception](#) be used to obtain functional listening in noise baseline data. Refer to [our course on administering the FLE](#) and the [White Paper on Estimating Access of Communication Effectiveness](#) for more information.

Obtain functional data about a student's ability to comprehend under a variety of types of noise, and signal-to-noise levels (speech above quiet background noise versus louder noise or competing voices). Teachers should create compromised listening situations with environmental background noise as well as situations where there are multiple people speaking at once, like in a restaurant, to assess their student's ability to accurately understand speech in noise. Signal-to-noise ratios should be manipulated to provide authentic results to the testing session. The teacher reads words and phrases consistently speaking at about 65 decibels, while the background noise is manipulated and require students to answer questions or repeat what was heard verbatim. Scores should be collected for a variety of auditory tasks and testing conditions should be consistent for each student.

Speech in Noise Training

Teaching students to listen in the presence of background noise helps students train their brains to focus on the auditory stimuli. Practicing these skills helps students extract meaning from noisy situations, which helps minimize access barriers for communication. Listening in noise can also encourage students to use compensatory strategies and advocate for accommodations. Students may employ strategies such as speechreading, asking for others to repeat what they are saying, asking others to face them when speaking, advocating for a quieter environment, using HAT in class, and reducing the distance between the speaker and listener. All communication repair and other accommodation strategies can help the student gain meaning from communication in noise.



Students with hearing loss tend to report that they aren't aware that they have missed information, therefore they don't always advocate for communication access.

Teachers can use real life situations to assist students with LIN by using compromised environments such as lunchroom, playground, assemblies, concerts, or extracurricular activities. Have the student practice listening to the teacher while natural background noise provides a barrier. [Ready-made materials with questions](#) can be used, reading passages from core content textbooks and answering questions, or having students repeat after hearing sentences from a children's books are all ideas for stimuli to use while listening in typical background noise. Using a sound-level meter application on a cell phone or a purchased SLM, measure the

Teachers of the deaf and hard of hearing must train the students to identify communication barriers, attempt to gain access through listening, speechreading and advocating for their needs, so that access is no longer an issue. The ability to listen in noise provides one more tool in their toolbelt for communication access.

level of background noise. Then, speaking around 60-65db, have the student try and repeat what is said or answer questions appropriately. Teachers must be cautious about the natural instinct to raise their voices when speaking, in attempts to speak over the level of noise. Practice listening in noise without visual cues, but allow speechreading intermittently to maintain motivation. Teachers can also create compromised listening situations, using background noise from pre-recorded environmental sounds (download the [Classroom Noise Audio File](#)) or sounds of people talking.

Again, a sound level meter is necessary to monitor the level of signal to noise ratios so you control the level of difficulty and can show true progress.

Practicing these skills on a regular basis can easily be incorporated into daily lessons for self-advocacy skill building, auditory training skills, compensatory strategies and for secondary transition preparation.

Identifying barriers to communication which limit auditory access is a skill that needs to be taught to students with hearing loss.

