

# THE FUNCTIONAL LISTENING EVALUATION

## Purpose of The Functional Listening Evaluation

The purpose of this evaluation is to determine how listening abilities are affected by noise, distance, and visual input in an individual's natural listening environment. It is designed to simulate listening ability in situations that are more representative of actual listening conditions than can often be replicated in sound booth assessment. Through observation of the administration of the evaluation, the student's teachers, parents, and others may gain appreciation of the affects of adverse listening conditions encountered by the student. The evaluation results are also useful in justifying accommodations, such as assistive listening devices, sign language or oral interpreters, notetakers, captioning, special seating, and room acoustic modifications. This protocol is based on a listening paradigm suggested by Ying (1990), and by Ross, Bracken, and Maxon (1992).

## Materials Needed

Cassette Tape Recorder or CD player  
Sound Level Meter - use A weighted scale (can be purchased inexpensively from Radio Shack)  
Noise Tape or CD - Multitalker is recommended (available from Auditec)  
Tripod or stand to hold sound level meter (optional)  
Word/Phrase/Sentence Lists for test stimuli  
Tape measure or yard stick  
Masking tape or marker (optional)

## Environment for Testing

Use the student's classroom during a time when it is empty. If this is not possible, choose a room that most closely approximates the size, ambient noise level, and floor and wall surfaces of the student's classroom. While performance during actual class sessions would seem ideal, the test process itself may be disruptive to instruction for the rest of the class and may not reflect the adverse conditions encountered by the student throughout the day.

## Physical Set-up of Test Environment

Due to room size and instructional style variations, the occupied classroom should be observed to determine maximum listening distances. The distance used should be recorded on the scoring form. These distances can be marked using masking tape on the floor. Be sure that the markers are from the student's ear to the examiner's mouth.

- Close: Noise and examiner are 3 feet in front of the student (see Diagram A).  
Distant: Noise remains 3 feet in front of the student; examiner moves back to the pre-determined distance [12 to 15 feet in this example] from the student (see Diagram B).



## Types of Evaluation Materials

The type of evaluation material utilized depends on the purpose of the assessment. If a measure of speech intelligibility is desired, conventional single word test stimuli should be utilized. However, if listening ability is to be assessed, the evaluation stimuli should more closely approximate material that is encountered by the student in the classroom. Consideration should be given to both familiar and new material that a student may encounter. In other words, a student may perform better with familiar material than with stimuli containing unfamiliar vocabulary. However, considering the nature of instruction in the classroom, students are faced with new material daily. The examiner must determine what they want to demonstrate and adjust the material accordingly.

Age and limited language and memory abilities of some students should also be considered when determining test stimuli. In selecting either sentence or word materials, consider whether the vocabulary and sentence structure are appropriate for the student's language ability. For students with poor speech intelligibility, it may be necessary to use materials that permit picture-pointing responses. If closed-set materials are utilized, performance can be expected to be better than with open-set materials. Once the stimuli are determined, it must remain constant throughout the assessment so that the variables manipulated are noise, distance, and visual input. Report the material used on the scoring form.

Sentence Materials:	BLAIR Sentences SPIN Sentences(older students) PSI Sentences	WIPI Sentences BKB Sentences
Phrase Materials:	Common Children's Phrases	Children's Nonsense Phrases
Word Lists:	PB-K WIPI	NU-CHIPS

Note: BLAIR, SPIN, WIPI, PSI, BKB sentences and the Common Children's Phrases are reproduced in the Educational Audiology Handbook (Johnson, Benson, & Seaton, 1997); Children's Nonsense Phrases are available from the author; word lists are available through any audiologist.

In most cases there will not be enough lists for the entire protocol (8 lists are needed). If it is necessary to use a list twice, select the lists that were more difficult for the student in order to reduce familiarity with the material.

## Presentation Levels

Speech to noise ratios should be based upon the auditory environment encountered by the student in the classroom. Sound level measurements of classroom discourse and activity may be necessary to determine these levels. For this example, levels will achieve approximate values of a +5 dB speech to noise ratio in the close condition and a -5dB speech to noise ratio in the distant condition (12-15ft). Levels will vary slightly depending upon the acoustics of the room and consistency of the speaker's voicing of the stimuli. Record the classroom ambient noise level (unoccupied) and approximate speech and noise levels on the scoring form.

Speech: Monitor speaker's voice with the sound level meter so that speech averages 75dBA at 1 foot from the examiner's mouth (will be approximately 65dBA at listener's ear).

Noise: Adjust volume of cassette or CD player, which is 3 feet from the student, using the sound level meter so that the multitalker noise averages 60 dBA at the student's ear.

## Presentation Protocol

The evaluation should be conducted in the student's typical hearing mode. If hearing aids are usually worn at school, they should also be worn during the evaluation. This evaluation can also be used to demonstrate the improved listening ability with FM or other assistive amplification, whether personal or sound field.

Eight sentence or word lists should be presented in the order indicated by the numbers on the scoring matrix. This order balances for difficulty across conditions so that the final task is the easiest of the distance conditions. The examiner may choose to alter the order for other reasons however.

The examiner should present the speech materials at a normal speaking rate. The student repeats the test stimuli or points to the appropriate picture, as dictated by the material used.

Test administration takes approximately 30 minutes, including set up, with sentences and 20 minutes with words.

1.	Auditory-Visual	Close	Quiet
2.	Auditory	Close	Quiet
3.	Auditory-Visual	Close	Noise
4.	Auditory	Close	Noise
5.	Auditory-Visual	Distant	Noise
6.	Auditory	Distant	Noise
7.	Auditory	Distant	Quiet
8.	Auditory-Visual	Distant	Quiet

## Scoring

Scoring should be completed using the protocol established for the selected test materials. All scores should be reported in percent correct in the Scorebox.

## Variations in Protocol

This protocol is based on the listening situation of a typical classroom. For an individual student, it may be useful to modify this protocol to account for variations in the level and source of noise, classroom size, teacher's voice, typical listening distances for the student, or other factors. In order to accommodate these variations, the following modifications may be considered. Modifications other than distance and speech and noise levels should be noted on the test form.

Placement of noise/tape recorder

Distance of examiner from student for the distant condition

Order of presentation.

Level of noise.

## Interpretation Matrix

The Interpretation Matrix analyzes the effects of noise, distance, and visual input for the various conditions. It is completed by transferring the scores from the Scorebox to the interpretation matrix. Individual scores are averaged to determine the overall effect of each condition. Although scores may be affected by different speakers, rate of speaking, attention of the listener, or status of amplification, as long as these variables are kept constant throughout the evaluation, comparisons are valid.

Individual and condition scores can be used to justify accommodations that may be beneficial for the student. They should be discussed with the student, his/her parents, and teachers to help them understand the student's listening abilities and needs. A summary of the Interpretation Matrix and appropriate recommendations should be included on the scoring form.

## References

- Auditec of St. Louis, Multitalker Noise Tape. 2515 S. Big Bend Blvd., St. Louis, MO 63143-2105; 800-669-9065, [www.auditec.com](http://www.auditec.com)
- Johnson, C.D. & VonAlmen, P.(1993). The Functional Listening Evaluation. In *Educational audiology handbook*, (pp 336-339). Johnson, Benson, & Seaton (1997). San Diego: Singular Publishing Group, Inc.
- Johnson, C.D. Benson, P.V., & Seaton, J.(1997). *Educational audiology handbook*, Sentence and Phrase Lists, Appendix Section 15 (pp 477-489). San Diego: Singular Publishing Group, Inc.
- Ross, M., Brackett, D. & Maxon, A. (1991). Communication Assessment. In *Assessment and management of mainstreamed hearing-impaired children* (pp 113–127). Austin, Tx: Pro-Ed.
- Ying, E. (1990). Speech and Language Assessment: Communication Evaluation. In M. Ross (Ed.), *Hearing-impaired children in the mainstream* (pp 45–60). Parkton, MD: York Press.

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Name: \_\_\_\_\_ Date: \_\_\_\_\_ Examiner: \_\_\_\_\_ Age/DOB: \_\_\_\_\_

## AUDIOMETRIC RESULTS

Hearing Sensitivity: Pure Tone Ave: Right Ear \_\_\_\_\_ dB Left Ear \_\_\_\_\_ dB

Word Recognition: Right Ear \_\_\_\_\_ % @ \_\_\_\_\_ dBHL Left Ear \_\_\_\_\_ % @ \_\_\_\_\_ dBHL

Sound Field: Aided Unaided

Quiet \_\_\_\_\_ % @ \_\_\_\_\_ dBHL

Noise \_\_\_\_\_ % @ \_\_\_\_\_ dBHL @ \_\_\_\_\_ S/N

## FUNCTIONAL LISTENING EVALUATION CONDITIONS

Amplification: None Hearing Aids FM Cochlear Implant

Sound Field Other \_\_\_\_\_

Classroom Ambient Noise Level (unoccupied): \_\_\_\_\_ dBA

Assessment Material: \_\_\_\_\_

Distance (distant condition): \_\_\_\_\_ ft Noise Stimulus: Multitalker Other \_\_\_\_\_

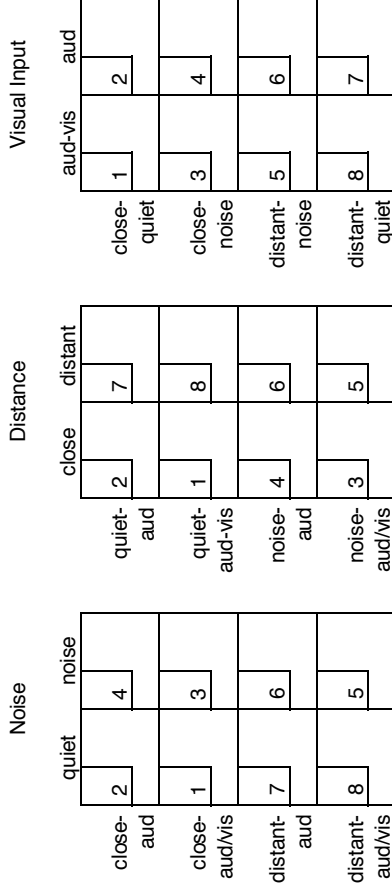
Speech level @ 1ft from examiner's mouth: \_\_\_\_\_ dBA

Noise level @ student's ear: \_\_\_\_\_ dBA

Approximate speech to noise levels: close + \_\_\_\_\_ dB distant - \_\_\_\_\_ dB

Other modifications In protocol:

## INTERPRETATION MATRIX



Average of above scores: \_\_\_\_\_ % quiet \_\_\_\_\_ % noise

\_\_\_\_\_ % close \_\_\_\_\_ % distant

\_\_\_\_\_ % aud/vis \_\_\_\_\_ % aud

## INTERPRETATION AND RECOMMENDATIONS

## FUNCTIONAL LISTENING SCOREBOX

	close/quiet	close/noise	distant/quiet	distant/noise
auditory-visual	1	3	8	5
auditory	2	4	7	6