

# 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

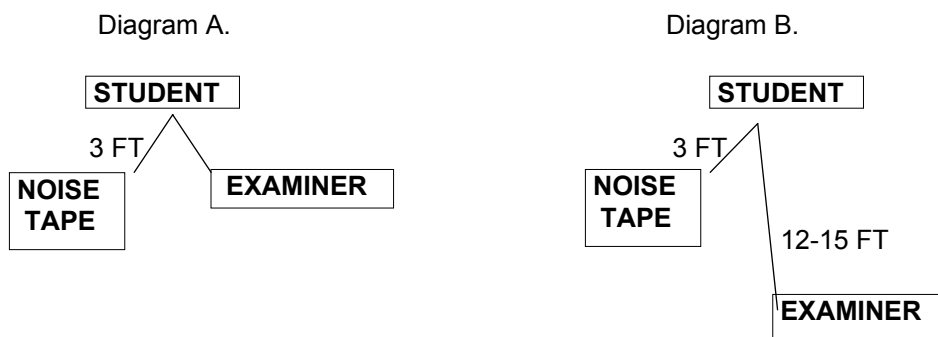
Use the student's classroom during a time when it is empty. If this is not possible, choose a room that most closely approximates the size, ambient noise level, and floor and wall surfaces of the student's classroom. While performance during actual class sessions would seem ideal, the test process itself 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**

In order to simulate classroom listening ability, the evaluation material utilized should approximate material that is encountered by the student in the classroom. Additionally the stimuli should have sufficient length to reflect reverberation characteristics of the room. Consideration should also be given to both familiar and new material that a student may encounter. Individuals will usually perform better with familiar material than with stimuli containing unfamiliar vocabulary. Individuals with unilateral and mild hearing losses tend to perform well under all conditions due to the audibility and inherent redundancy in phrase and sentence material utilizing familiar vocabulary. Nonsense phrases have been constructed to decrease these performance effects.

Age, limited language, and memory abilities of the individual should also be considered when determining the test stimuli. In selecting word, phrase or sentence materials, consider whether the vocabulary and syntax 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 type of stimuli is 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:	B-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 many of the above materials 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 71dB SPL at 18 inches from the examiner's mouth (will be about 65dBA at listener's ear for close conditions).
- 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	Order of presentation.
Distance of examiner from student for the distant condition	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.

# THE FUNCTIONAL LISTENING EVALUATION

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 @ 18 inches from examiner's mouth: \_\_\_dBA  
 Noise level @ student's ear: \_\_\_dBA  
 Approximate speech to noise levels: close + \_\_\_dB distant - \_\_\_dB  
 Other modifications in protocol:

## FUNCTIONAL LISTENING SCOREBOX

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

## INTERPRETATION MATRIX

	Noise		Distance		Visual Input	
	quiet	noise	close	distant	aud-vis	aud
close-aud	2	4	2	7	1	2
close-aud/vis	1	3	1	8	3	4
distant-aud	7	6	4	6	5	6
distant-aud/vis	8	5	3	5	8	7

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

quiet      noise      close      distant      aud/vis      aud

## INTERPRETATION AND RECOMMENDATIONS

## COMMON CHILDREN'S PHRASES<sup>1</sup>

### LIST 1

1. He fell down.
2. Clean this up.
3. It's not for you.
4. Can you see me?
5. Can I play now?
6. Look over there.
7. It's lunch time.
8. Can you help me?
9. Close your eyes.
10. Let me have it.
11. Clean up the mess.
12. Hold this toy.
13. Bring it here.
14. Who is missing?
15. Take my hand.
16. Ring the bell.
17. Let me have it.
18. You can't make me.
19. Can I have some?
20. Go right now.

Score (@ 5% each) \_\_\_\_\_

### LIST 2

1. Can I go play?
2. Who is that?
3. Can we go?
4. Have a nice day.
5. What's the matter?
6. What's going on?
7. How are you?
8. Can you play?
9. I don't want to.
10. It's snowing outside.
11. That is neat.
12. No way man.
13. Leave me alone.
14. Do I have to?
15. Where's the crayons?
16. Why can't I go?
17. I want that.
18. That's cool.
19. When can I?
20. No way.

Score (@ 5% each) \_\_\_\_\_

### LIST 3

1. See you later.
2. Got to go now.
3. Let me have it.
4. I'm tired.
5. That's awesome.
6. Way to go.
7. That's tough.
8. Turn the light off.
9. Stop that now.
10. Guess what?
11. Do you want to play?
12. Give it over.
13. Can we be friends?
14. She did it.
15. Do you know what?
16. You can't do that.
17. Watch this.
18. Tie my shoe.
19. What's up?
20. I can't find it.

Score (@ 5% each) \_\_\_\_\_

### LIST 4

1. Can I watch TV?
2. Where is it?
3. Let's go play.
4. I don't feel good.
5. Can we draw?
6. I want to.
7. Like my picture?
8. Can I go too?
9. Can we play that?
10. I want that toy.
11. Where are we going?
12. Where's my shoe?
13. Leave me alone.
14. Can we stop?
15. I want some.
16. That one is mine.
17. I get the front.
18. It was my turn.
19. Did you see mine?
20. Let's stop there.

Score (@ 5% each) \_\_\_\_\_

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<sup>1</sup> Phrase lists have been matched for length and for comprehension difficulty using the Flesch Reading Ease Index; they had not yet been field tested.

LIST 5

1. Why can't I?
2. Do we have to?
3. Soccer is cool.
4. Can I open it?
5. Pick a team.
6. Where's my shoe?
7. How come?
8. I get to go.
9. Stop it now.
10. School was fun.
11. We played outside.
12. I know a song.
13. Can you do that?
14. Come in my house.
15. I don't know.
16. It's time for art.
17. Make my day.
18. I am hungry.
19. Go for it.
20. Why not?

Score (@ 5% each) \_\_\_\_\_

LIST 6

1. Know what Mom?
2. I'm sick.
3. Where's my present?
4. Give me that.
5. I didn't do it.
6. Put your shoes on.
7. That's so cool.
8. Who is it?
9. He threw it.
10. What time is it?
11. He tripped me.
12. Lets play Nintendo.
13. It's time for lunch.
14. Want to ride bikes?
15. This is dumb.
16. It's my turn.
17. I wrecked my bike.
18. Watch out.
19. My tooth is loose.
20. I want money.

Score (@ 5% each) \_\_\_\_\_

LIST 7

1. I broke my arm.
2. My lunch is gone.
3. Is it recess?
4. Do I have to?
5. Stay off the hill.
6. Don't worry.
7. That's my sweater.
8. My dog is gone.
9. I want an A.
10. Buy me that book.
11. I hate spinach.
12. I don't feel good.
13. You can't make me.
14. That's my phone.
15. Get that off.
16. Change the channel.
17. What a ride.
18. It's mine now.
19. Finders keepers.
20. Get off my bed.

Score (@ 5% each) \_\_\_\_\_

LIST 8

1. I bit the dust.
2. He kept it.
3. That song is sad.
4. He poked by eye.
5. I like candy.
6. Get the ball.
7. He kicked me.
8. Why can't I?
9. No thank you.
10. Where's the ball?
11. I don't know.
12. You know what?
13. My homework is late.
14. I hate that.
15. I don't get it.
16. Don't mess with me.
17. Keep your hands off.
18. That's my steak.
19. Let's get pizza.
20. I skinned my knee.

Score (@ 5% each) \_\_\_\_\_

## PEDIATRIC NONSENSE PHRASES

### LIST 1

21. Down fell he boat.
22. Up this clean floor.
23. You table not.
24. Me you see can.
25. Now play I go.
26. There over look.
27. Lunch not time do.
28. Help you can me.
29. Eyes yours on blue
30. Have me let ball.
31. Mess up the clean.
32. Toy hold this now.
33. It here bring me.
34. Missing who done.
35. Hand my take go.
36. The ring bell not.
37. Have it let me.
38. Can make me you.
39. Now go right house.
40. Have some can I.

Score (@ 5% each) \_\_\_\_\_

### LIST 2

1. Play go can I.
2. That is who stop.
3. Go we can draw.
4. Day nice have down.
5. Matter the what.
6. Going on what.
7. Snowing you are.
8. Play you here can.
9. I do want not to.
10. Outside it is.
11. Neat that ahead.
12. Man no become.
13. Alone me leave.
14. Do have I to
15. Crayons the where.
16. Can go why I.
17. Want I come book.
18. Cool that on hope.
19. I when can here.
20. Way no ball count.

Score (@ 5% each) \_\_\_\_\_

### LIST 3

21. You later see.
22. Now to go got.
23. It have me let.
24. Tired am I.
25. Awesome that is.
26. Go way to here.
27. Tough is that now.
28. Off light the turn.
29. Now that stop from.
30. What guess you home.
31. Play to want you do.
32. Over it give.
33. Friends be we can.
34. It did she go.
35. What know you do.
36. That do can you.
37. Watch no this go.
38. Shoe my fix now
39. Up what is tie.
40. It find cannot.

Score (@ 5% each) \_\_\_\_\_

### LIST 4

21. TV watch can.
22. Book is it where.
23. Play to let go.
24. Good feel not do.
25. Draw we can here.
26. Food to want dog.
27. Picture my like.
28. To go I can.
29. That play we hope.
30. Toy that want I.
31. Going we are.
32. Shoe my is where.
33. Alone me leave.
34. Stop we can now.
35. Some want I tell.
36. Mine is one that.
37. Front the get back.
38. Turn my was now.
39. Mine see you did.
40. There stop let is.

Score (@ 5% each) \_\_\_\_\_

NOTE: Exact repetition of each phrase is required to be correct.

**PEDIATRIC NONSENSE PHRASES**

LIST 5

- 21. I not can why.
- 22. To have we do.
- 23. Cool is soccer.
- 24. It open I can.
- 25. Team a pick you.
- 26. Shoe my is where.
- 27. Come how to here.
- 28. Go to get it.
- 29. Now it stop pen.
- 30. Day fun was school.
- 31. Outside play we.
- 32. Song to know I.
- 33. That do you can.
- 34. House my in come.
- 35. Know I do not.
- 36. Art for time is.
- 37. Day my make go.
- 38. Hungry am I here.
- 39. It for go home.
- 40. Not is why eat.

Score (@ 5% each) \_\_\_\_\_

LIST 6

- 21. Mom what know me.
- 22. Sick am I here.
- 23. Present my where.
- 24. That me give book.
- 25. Paper It do.
- 26. On shoe you put.
- 27. Cool so that is.
- 28. It is who gone.
- 29. Threw he become.
- 30. It is time what.
- 31. Me tripped he.
- 32. Game play us for.
- 33. Lunch for time is.
- 34. Bike ride to want.
- 35. Dumb is this for.
- 36. Turn my come is.
- 37. Bike my wreck here.
- 38. Out is watch go.
- 39. Loose is my gum.
- 40. Money want I.

Score (@ 5% each) \_\_\_\_\_

LIST 7

- 21. Arm my broke I.
- 22. Gone is lunch my.
- 23. Recess it is.
- 24. To have I do.
- 25. Hill the off stay.
- 26. Worry not do.
- 27. Sweater that is.
- 28. Gone is dog my.
- 29. Boat want go now.
- 30. Book that me buy.
- 31. Spinach like me.
- 32. Good feel not do.
- 33. Me make not can.
- 34. Phone my is that.
- 35. Off that get here.
- 36. Channel the eat.
- 37. Ride a what to.
- 38. Now mine is it.
- 39. Keep the find key.
- 40. Bed my off get.

Score (@ 5% each) \_\_\_\_\_

LIST 8

- 21. Dust the bit I.
- 22. It kept he gone.
- 23. Sad is song that.
- 24. Eye by poke here.
- 25. Candy like I done.
- 26. Ball the get gone.
- 27. Me kicked he for.
- 28. I not can why.
- 29. You thank no see.
- 30. Ball that where on.
- 31. Know not do lunch.
- 32. What know you for?
- 33. Late is work home
- 34. That hate to do.
- 35. It get not done.
- 36. Me with mess not.
- 37. Off hands your keep.
- 38. Steak my is that.
- 39. Pizza get let.
- 40. Knee my hurt now.

Score (@ 5% each) \_\_\_\_\_

NOTE: Exact repetition of each phrase is required to be correct