For use in a virtual online environment, the FLE can be used to:
- assess how the variables of background noise, visual access, and internet speech transmission quality impacts understanding of the teacher's voice during remote instruction;
- compare performance under various listening conditions including personal hearing instruments, headphones and/or remote microphone hearing assistance technology;
- demonstrate effects of various face masks.

1. Collect materials
- CD player, iPad, phone or laptop computer to play noise source
- Sound Level Meter or SLM App - use A weighted scale
- Headset microphone connected to computer for examiner
- Classroom noise source (.wav sound file, classroom noise or multi-talker noise is recommended)
- Word/Phrase/Sentence Lists for test stimuli

2. Set-up

a. Presentation Levels

The auditory and auditory-visual modes are presented in quiet (2 presentations) and then in noise (2 presentations) to achieve the four conditions. Sound level measurements of the student's environment and the examiner's voice levels are necessary to achieve +5 dB speech advantage for quiet and a -5 dB speech level for noise. The SLM app should be downloaded to the student's phone or other device prior to administering this procedure. These procedures are:

1) Room Noise Level: Using a sound level meter phone app, guide the student, or other assistant at the student's location, to measure the noise level within approximately 1 foot from the student's ear. Record level under FLE Conditions on the summary form.

2) Calibrate the examiner's voice level: While the examiner is reading a short passage, ask the student or assistant to adjust the volume of the device that they are using for instruction (e.g., computer, notebook) to a comfortable listening level. Using the sound level meter phone app, ask the student or assistant to measure the level of the voice signal within 1 foot of their ear. This computer or device volume level must be maintained throughout the assessment. Record the level under FLE Conditions on the summary form.

3) Speech-to Noise Ratio (SNR) Level: Record the speech level that is above the room noise level. For example, if the speech level was 60 dBA and the room noise level was 40 dBA, the SNR is +20dB. Record the level under FLE Conditions on the summary form.

4) Noise Source: Open the noise source on the examiner's computer or other device. For the noise conditions, adjust the volume of the noise source (classroom or multi-talker noise) while guiding the student or an assistant using the sound level meter app, so that the **noise level is 5 dB greater than the examiner's voice level** within 1 foot of the student's ear. This yields a -5 dB speech-to-noise ratio level. For example, if the examiner's voice level is 60dBA at the student's ear, the noise level should be adjusted to measure 65 dBA at the student's ear. If -5 dB is too difficult, the noise level may be reduced so that the voice level and noise are at the same level (0 dB SNR).


b. Presentation Protocol

Basic Conditions with students personal hearing instrument:
1. Auditory-Visual: Quiet (examiner using headset mic with student facing examiner for visual access)
2. Auditory: Quiet (examiner using headset mic with camera off to eliminate visual access)
3. Auditory-Visual: Noise (same as condition 1 with the addition of noise)
4. Auditory: Noise (same as condition 2 with the addition of noise)

Optional Conditions (5-8): For student - add headphones, add RM HAT system; For examiner: add facemask, add RM system, remove headset microphone; or other modification or condition as desired. Note the conditions on the Scorebox.

3. Scoring and Interpretation

a. Scoring should be completed using the established procedures for the selected test material.

b. Transfer the percentage correct scores from the Scorebox to the same numbered box in the Interpretation Matrix to analyze the effects of the various conditions. Individual scores are summed and 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, comparisons are valid if these variables are kept constant throughout the evaluation.

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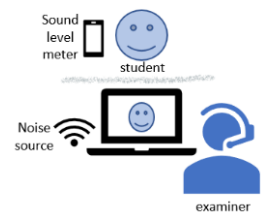
[1] Based on Functional Listening Evaluation by C.D. Johnson & P. Von Almen, 1993; Updated 2013 by C.D. Johnson

[2] 11.19.20. Available from www.ADEvantage.com

THE FUNCTIONAL LISTENING EVALUATION: SUMMARY FORM
Modified for Virtual Administration

Name:_____ Date:_____ Examiner:_____ Age/DOB:_____ Grade:____

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 Aid(s) ☐ Cochlear Implant(s)
         ☐ Bone- conduction device

Hearing Assistance Technology: ☐ RM DM/FM system   Other_____

Headphones ☐   Other_____

Assessment Material:_____

Noise Stimulus: ☐ Multi-talker ☐ Classroom noise ☐ Other_____

Noise level @ listener's ear: ____dBA SPL

Speech level @ listener's ear: ____dBA SPL (without HAT or headphones)

Approximate speech to noise level (SNR): ____dB

Other modifications in protocol:_____

FUNCTIONAL LISTENING SCOREBOX

[Note condition here]
_____ _____

	quiet	noise		
auditory-visual	1	3	5	7
auditory only	2	4	6	8

INTERPRETATION MATRIX

Noise

	quiet	noise
aud/vis	1	3
aud	2	4

Visual Input

	aud	Aud/vis
quiet	2	1
noise	4	3

Other:

	aud-vis	aud
_____	5	6
_____	7	8

Average scores: _____% ____%   _____% ____%   _____% _____%
             quiet   noise   aud   aud/vis   aud/vis   aud

INTERPRETATION AND RECOMMENDATION