

## Learning Objectives

- Attendees will be able to describe the importance of using accessible language when instructing audiological testing.
- Attendees will be able to identify the criteria for accessible language and complex language.
- Attendees will be able to recognize if phrases for audiological testing utilize accessible language.

## Background

Children with developmental disabilities have a higher prevalence of hearing loss and unknown hearing status than typically developing children<sup>2</sup>. Therefore, audiologic evaluations are critical for this population to ensure they can access appropriate supports and services. Yet, many children with developmental disabilities have cognitive and linguistic challenges that present a barrier to their participation. Inaccessible language can compromise a patient's ability to participate effectively in testing which can lead to misdiagnoses, overreliance on sedated testing techniques, and a delay in receiving care. While the importance of language is widely acknowledged, no previous studies have examined the accessibility of language used by audiologists during testing.



## Methods

The goal of this project was to evaluate the language accessibility of published scripts used in an audiologic test battery by McTee and colleagues<sup>4</sup>. The evaluation criteria were developed by a team of audiologists and speech-language pathologists based on a set of criteria designed to minimize text complexity for individuals who listen or read with comprehension below a third grade level<sup>3</sup>. Each script received a binary (yes/no) rating for the presence of 25 factors known to support language clarity, such as simple syntax, reduced sentence length, high-frequency word choices, general concreteness, and relevance to the experiences of a child. During training, four graduate students in audiology separately rated the scripts from another study. Fleiss' kappa of .908 was calculated for the training scripts on point-by-point comparisons of the four coders' scripts. For the present study, the same raters coded all of the scripts. Fleiss' kappa was .879, which is considered excellent agreement. Any differences between raters were resolved with discussion.

## References

- Benson-Goldberg, S., Geist, L., Satterfield, B., Bunn, D., & Erickson, K. (2022). Minimizing the complexity of public health documents: making COVID-19 documents accessible to individuals who read below the Third-Grade level. In *Assistive Technology Outcomes and Benefits*.
- Bonino, A. Y., Goodwich, S. F., & Mood, D. (2024). Prevalence and characteristics of developmental disabilities among children who receive hearing health care. *American Journal of Audiology*, 34(1), 60–71. [https://doi.org/10.1044/2024\\_aja-24-00118](https://doi.org/10.1044/2024_aja-24-00118)
- Center for Literacy & Disability Studies, Hadden, Kushalnagar, Cunningham, Schuster, & Erickson. (2021). *MTC Guidelines*. <https://www.med.unc.edu/healthsciences/clds/wp-content/uploads/sites/859/2021/06/Minimized-Text-Complexity-Guidelines-version-2.03.2021.pdf>
- McTee, H. M., Mood, D., Fredrickson, T., Thrasher, A., & Bonino, A. Y. (2019). Visual supports for children with ASD (McTee et al., 2019). *Figshare ASHA Publications*. <https://doi.org/10.23641/asha.10086434>
- Nightengale, E. E., Wolter-Warmerdam, K., Yoon, P. J., Daniels, D., & Hickey, F. (2020). Behavioral audiology procedures in children with Down Syndrome. *American Journal of Audiology*, 29(3), 356–364. [https://doi.org/10.1044/2020\\_aja-19-00076](https://doi.org/10.1044/2020_aja-19-00076)

## Results

Criteria	Number of Scripts that Met the Criteria
1) Is the script/text directly relevant to the lives of the intended audience?	3/8 (37.5%)
1a) Does the script/text include information about what the audiologist will be doing or what will be happening to the child?	8/8 (100%)
1b) Does the script/text include information about the sensory experience?	5/8 (62.5%)
1c) Does the script/text include information about the child's expected response or behavior?	5/8 (62.5%)
1d) Does the script/text only include language, knowledge and background experiences that are relevant to the child?	8/8 (100%)
Does the script/text have a clear, singular focus?	8/8 (100%)
Is the script/text written in the active voice?	5/8 (62.5%)
Are content words repeated throughout the text/script?	6/8 (75%)
Does the script/text include the most important information, what the child is expected to do or how the child is expected to behave, at the beginning or the end of the text/script?	4/8 (50%)
Is there only one idea or key point per sentence?	3/8 (37.5%)
Are all sentences 10 words or less?	2/8 (25%)
Are compound and complex sentences avoided?	2/8 (25%)
Are the sentence types or structures repeated at least once?	2/8 (25%)
Is negation avoided?	7/8 (87.5%)
Are personal pronouns near their reference and clear? Is the use of demonstrative pronouns (this, that, these, those) avoided? Are content words repeated instead of using pronouns?	4/8 (50%)
Is figurative language avoided?	7/8 (87.5%)
Are 92% of the words among the most frequently occurring 3000 words in written English?	5/8 (62.5%)
Are words with the fewest possible syllables used?	6/8 (75%)
Are the majority of the words in the script/text concrete?	8/8 (100%)
Are all the words that describe what the audiologist will be doing or what will be happening to the child concrete?	7/8 (87.5%)
Are all the words that describe the sensory experience concrete?	5/8 (62.5%)
Are complex, or technical words and ideas avoided?	8/8 (100%)
Is the type.token ratio <.40?	0/8 (0%)
Does the text respect body boundaries?	8/8 (100%)
Avoid use of language that promises something won't hurt or won't be uncomfortable.	7/8 (87.5%)

## Discussion

Analyses across the scripts revealed common strengths in the clarity of language in areas such as respecting the body boundaries of the child, avoiding complex words and ideas, and avoiding the use of figurative language. The analysis also returned general areas for improving language clarity by ensuring all sentences were 10 words or less, highlighting only one key idea per sentence, and leveraging the repetition of sentence types and structures. Frequent topics of discussion among the team consisted of variable sentence structure within an individual script and discrepancies in the categorization of abstract language. Compiling this data allowed for the identification of these patterns and the possible refinement of the guidelines in future script analysis. Future studies should further investigate the application of the criteria for minimizing text complexity for the development of scripts that are more accessible to children with cognitive and linguistic challenges. Additionally, it would be important to investigate the impact of such criteria on the comprehension and participation of these children during audiometric assessment.

## Script Revision Process

### Original Script

Audiologist:  
 "Look at this light."  
 "I can see it on your hand. [*shine light onto child's hand*]"  
 "I can see it on your arm. [*shine light onto child's arm*]"  
 "I am going to use this light to look in your ear."<sup>4</sup>

### First Revision

"Look at my light!  
 Look at my light on your hand. [*shine light onto child's hand*]"  
 Look at my light on your arm. [*shine light onto child's arm*]"  
 Do you want to touch the light? [*let child feel specula*]"  
 Now I will look in your ear with my light.  
 Sit still in the chair.  
 Keep your hands still."

### Final Revision

"Look at my light!  
 My light is on my finger. [*shine light on your finger*]"  
 My light is on my arm. [*shine light on your arm*]"  
 You can touch my light! [*let child feel specula*]"  
 My light is on Mom's finger. [*shine light on Mom's finger*]"  
 My light is on Mom's arm. [*shine light on Mom's arm*]"  
 Mom, you can touch my light! [*let Mom feel specula*]"  
 Now I will look in mom's ear. [*point*]"  
 Mom, sit still. [*perform otoscopy*]"  
 Mom, you sat still! [*high five*]"  
 Now it's your turn! [*turn to child*]"  
 Look at my light on your finger. [*shine light onto child's finger*]"  
 Look at my light on your arm. [*shine light onto child's arm*]"  
 Now I will look in your ear with my light.  
 Sit still in your chair. [*perform otoscopy*]"  
 You sat still!"

## About the Authors

The authors are full-time graduate students in the Doctor of Audiology (AuD) program at UNC-Chapel Hill and audiology trainees in the North Carolina Leadership Education in Neurodevelopmental and Related Disabilities (LEND) Program. This project is being completed with mentorship by faculty in the Department of Health Sciences at UNC and in the Department of Speech-language Pathology at Oklahoma Baptist University.