

CHAPTER TWENTY

PSYCHO-EDUCATIONAL ASSESSMENT AND DIAGNOSIS FOR CHILDREN WITH HEARING IMPAIRMENT

Abbah Victor Ojochenemi

*Department of Special Education and Rehabilitation Science (HH)
Faculty of Education, University of Jos*

Introduction

Individuals with hearing impairment face unique challenges in their daily lives. One of the most pressing of these challenges is the educational setting. Traditional measures of educational attainment, such as standardized tests and classroom activities, rely heavily on auditory input. This means that individuals with hearing impairment may struggle to demonstrate their true potential in these areas. To overcome this issue, psycho-educational assessments have been developed explicitly for individuals with hearing impairments. These assessments are designed to measure cognitive and academic skills without relying on auditory input. Currently, hearing impairment is a widespread problem in society. According to the World Health Organization (WHO), approximately 466 million people worldwide live with hearing loss, and approximately 34 million of them are children, with over 60% of childhood cases being preventable (WHO, 2020).

Diagnosis refers to the identification of the nature and cause of an illness (Wiktionary 2023). Tests to diagnose hearing loss may include: physical exam, where a health care provider looks in your ear for possible causes an individual's hearing loss. Standard diagnostic tests may include pure-tone audiometry, speech audiometry and tympanometry. Therefore, it is crucial to diagnose and provide appropriate interventions for children with early hearing loss to develop adequately. The diagnostic process involves a multi-faceted approach that includes audiological evaluations, medical examinations, and behavioral assessments (Smith et al., 2015). Audiological evaluations utilize various tests such as pure-tone audiometry, speech audiometry, and emittance measures to determine the degree and type of hearing loss (Bess & Humes, 2015). Medical examinations assess the root cause of hearing impairment, identifying any organic factors affecting the auditory system (Agrawal et al., 2017). Behavioral assessments, such as observation and interviews, are employed to gauge the functional impact of hearing loss on daily life (Antonelli, 2018).

Hearing impairment is a broad term used to describe any type of hearing loss or hearing problem. Also, Hearing impairment is an umbrella term that refers to a condition where there is a decrease in the individual's ability to hear and discriminate sounds. Hearing impairment is classified by age of onset which can further be declassified under congenital and adventitious hearing loss, degree of

hearing loss which can also be declassified under hard-of-hearing and deafness, and site of lesion, which can also be declassified into three classifications namely conductive, sensorineural and mixed loss. (Babudoh. 2021).

Intervention on the other hand is an orchestrated effort and/or attempt to offer professional help to an individual suffering any disabling condition (Wiktionary 2023). Some of the intervention options include treatment, working with a professional or team who can help a child and family learn to communicate, getting a hearing device such as hearing aid, joining support groups, taking advantage of other resources available to children with hearing loss and their families.

Psychological assessment is a process of gathering and analyzing information to make inferences about a person's psychological functioning, personality traits, and abilities. Psychological assessment is crucial in diagnosing persons with hearing impairment because people with hearing loss can experience emotional and mental health challenges that impact their overall well-being. Diagnosis for hearing impairment typically involves a series of tests and examinations by a medical professional specializing in hearing disorders such as an audiologist or otolaryngologist.

Education is a process teaching and receiving instruction or knowledge such that the receiver becomes enlightened. The aim of this educational enlightenment is to make the educated become an independent, self-reliant and responsible member of the society.

A psycho-educational evaluation is a comprehensive assessment used to identify a child's functioning level and help guide educational and intervention planning. Different factors need consideration when evaluating children with hearing impairments. For instance, audiometric assessment is mandatory and used to measure the degree and type of hearing loss. Behavioral assessments, including observation, rating scales, and parent/teacher interviews, are used to obtain information about the child's general adaptation, emotional, social, and academic functioning (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, 2014). Additionally, it's essential to assess a child's cognitive functioning through psycho-educational tests with appropriate modifications to ensure that they obtain an accurate measurement without relying on their hearing ability (Pindzola et al., 2017). Research has mentioned that children with hearing impairments tend to have lower cognitive abilities than those without hearing loss (Korbi et al., 2016). Therefore, obtaining an accurate cognitive level is crucial in developing appropriate educational plans.

Psycho-educational assessments typically take place in educational or clinical settings, such as schools, universities, private clinics, or assessment centers. It is essential to consider the individual's cultural and linguistic background when conducting psychological assessments with hearing impairments.

The thesis statement of this chapter is hinged on a) various forms of psychological assessment, b) professionals involved in psycho-educational assessment, c) intervention and educational planning, d) benefits of psycho-educational assessment, e) challenges of psycho-educational assessments, f) Implications, g) Conclusions, h) suggestions.

Forms of Psycho-Educational Assessment for Children with Hearing Impairment

Psychological assessment for individuals with hearing impairment may involve various tests such as cognitive and IQ tests, personality and emotional assessments, adaptive behavior assessments, and social skills assessments. These assessments aim to identify the psychosocial factors that could impact the social and emotional development of individuals with hearing impairment. The diagnostic process may start with a physical examination of the ear and a medical history review to identify possible causes such as infections, trauma, genetic or hereditary factors, medication use, and noise exposure. For example, individuals with hearing loss may experience communication difficulties, which may lead to feelings of isolation, low self-esteem, and poor social skills. The psychological assessment can identify these issues and provide targeted interventions to help individuals overcome these challenges. These various tests are further expounded.

1. Cognitive Assessments

Cognitive tests are standard assessments that evaluate an individual's intellectual abilities and cognitive functioning. Individuals with hearing impairment may experience difficulties in verbal communication, which can cause difficulties in standard cognitive tests that rely heavily on verbal communication. Therefore, alternative tests are used that do not rely on verbal communication for assessment. Examples of alternative cognitive tests for individuals with hearing impairment include Non-Verbal Intelligence Tests (NVIQ), such as the Raven Progressive Matrices test, which is a standardized cognitive test that assesses the ability to recognize patterns in shapes, figures, and colors. Other nonverbal tests may include tests of working memory, attention, and visual-spatial abilities that require minimal or no verbal communication.

The cognitive assessments developed for individuals with hearing impairment focus primarily on nonverbal cognitive skills. These assessments help to measure the cognitive abilities of individuals without relying on auditory input. Some of the most common cognitive assessments for individuals with hearing impairment include:

a. Kaufman Assessment Battery for Children (KABC-II)

The KABC-II is a widely used assessment tool that measures cognitive abilities across a wide range of domains. This assessment tool is particularly useful for individuals with hearing impairment because it utilizes nonverbal stimuli to measure cognitive abilities. The KABC-II includes several

- subtests, including sequential processing, simultaneous processing, and learning ability.
- b. Universal Nonverbal Intelligence Test (UNIT)
The UNIT is another popular assessment tool designed to measure cognitive abilities without using verbal stimuli. The UNIT measures cognitive abilities across several domains, including attention, memory, and problem-solving. This assessment tool is particularly useful for individuals with hearing impairment who may struggle with language-based tests.
 - c. WISC-V Nonverbal
The WISC-V is one of the most widely used assessment tools for measuring cognitive abilities. While the standard version of the WISC-V relies heavily on verbal stimuli, a nonverbal version is also available. This nonverbal version measures cognitive abilities using only nonverbal stimuli, making it an ideal assessment tool for individuals with hearing impairment.

2. Academic Assessments

Academic assessments for individuals with hearing impairment measure academic skills without relying on auditory input. These assessments help to measure academic skills and identify areas where individuals may need additional support or accommodations. Some of the most common academic assessments for individuals with hearing impairment include:

- a. Woodcock-Johnson Tests of Achievement
The Woodcock-Johnson Tests of Achievement measure academic skills across a wide range of domains, including reading, math, and writing. This assessment tool is particularly useful for individuals with hearing impairment because it relies on visual stimuli rather than auditory input.
- b. Gray Oral Reading Tests (GORT)
The GORT measures reading skills using oral reading passages. However, the GORT also includes a silent reading component. This allows individuals with hearing impairment to demonstrate their reading skills without relying on auditory input.
- c. Test of Written Language (TOWL)
The TOWL measures writing skills using a variety of tasks, including spelling, word usage, and sentence composition. This assessment tool is particularly useful for individuals with hearing impairment who may struggle with language-based tests.

3. Personality and Emotional Assessments

Personality and Emotional assessments are tools for evaluating an individual's unique attributes, traits, and emotional states. These assessments are essential for individuals with hearing impairment because hearing difficulties may result in psychosocial stress, anxiety, and depression. Assessing personality traits and emotional well-being in individuals with hearing impairment is crucial for understanding their overall psychological functioning. The Personality Assessment Inventory (PAI), developed by Morey (1991), is a comprehensive tool that assesses

various personality dimensions and psychopathology. It can be adapted by considering the unique experiences and challenges faced by individuals with hearing impairment.

Assessments for personality and emotional states often require some verbal communication, but may also use other communication tools, such as sign language, lip reading, or written communication. Examples of personality and emotional tests for individuals with hearing impairment include the Minnesota Multiphasic Personality Inventory (MMPI), which assesses an individual's emotional well-being, and the Beck Depression Inventory (BDI), which assesses depressive symptoms. Additionally, several specific measures have been developed to assess emotional well-being in this population. For instance, the Depression, Anxiety, and Stress Scales (DASS) by Lovibond and Lovibond (1995) and the Strengths and Difficulties Questionnaire (SDQ) by Goodman (1997) can be employed to evaluate emotional difficulties and strengths in individuals with hearing impairment.

4. Adaptive Behavior Assessments

Adaptive behavior assessments evaluate an individual's ability to function independently and adapt to everyday life. These assessments can help professionals determine an individual's level of functional ability and identify areas for improvement. Individuals with hearing impairment often require adjustments to their environment, assistance with communication, and additional support to help them navigate everyday tasks. The most commonly used measure in this domain is the Vineland Adaptive Behavior Scales (VABS), developed by Sparrow et al. (1984). The VABS assesses various domains, including communication, daily living skills, socialization, and motor skills. The assessment can be modified to accommodate individuals with hearing impairment, considering their specific limitations and needs.

5. Social Skills Assessments

Social skill assessments evaluate an individual's communication and social skills in different settings. For individuals with hearing impairment, communication may be a challenge, and social settings may require unique adaptations to promote effective communication. Social skill assessments for individuals with hearing impairment may employ the use of sign language or written communication to assess communication abilities. One widely used tool is the Social Skills Rating System (SSRS) developed by Gresham and Elliott (1990), which assesses social skills across different settings and age groups. Another assessment often used for individuals with hearing impairment is the Social Skills Improvement System (SSIS) by Gresham and Elliott (2008).

Researchers have also highlighted the importance of considering cultural and linguistic factors specific to individuals with hearing impairment in social skills assessment. For example, Marschark et al. (2012) developed the Social Skills Rating System-Deaf (SSRS-D) to address the unique social challenges faced by this population.

Professionals Involved in Psycho-Educational Assessment

The professionals involved in psycho-educational assessments form the multi-disciplinary team which administer the psycho-educational diagnosis/assessments at the different stages of interventions. These professionals are briefly discussed and may include:

1. **Psychologists:** They administer and interpret the assessments, providing a comprehensive understanding of the individual's cognitive and academic strengths and weaknesses.
2. **School Psychologists:** Often employed by educational institutions, they conduct psycho-educational assessments to help identify learning disabilities, giftedness, or other exceptionalities that may impact a student's education.
3. **Educational Diagnosticians:** These professionals specialize in assessing individuals' academic abilities and identifying learning difficulties or disabilities.
4. **Speech-Language Pathologists:** They play a role in assessing speech and language abilities, which can contribute to an individual's overall educational performance.
5. **Occupational Therapists:** They evaluate how an individual's sensory and motor skills impact their learning and daily functioning.

Each professional plays a specific role in contributing valuable insights to the psycho-educational assessment process, working collaboratively to identify strengths and areas of need, and make appropriate recommendations for intervention or support.

Interventions and Individualized Educational Planning for Hearing-Impaired Children:

Psychological interventions programs for individuals with hearing impairments refer to a set of strategies that aim to enhance their functioning, development, and participation in society. Here are some of the common interventions:

1. **Hearing Aids and Cochlear Implantation:** Hearing aids and cochlear implants are technological devices that can amplify or directly stimulate the auditory nerve. Cochlear implants allow sound to bypass the damaged portion of the ear and transmit signals directly to the brain. These devices can be helpful in improving a child's hearing ability and subsequent language development (National Institute on Deafness and Other Communication Disorders, 2019).
2. **Speech and Language Therapy:** Speech and language therapy aims to improve a child's communication abilities. Hence, early speech perception test is one unique necessary and important function of the auditory system. Speech skills such as Supra-Segmental Development, Phonetics, and

Phonological development are also deployed in the speech and language training and evaluation process. The strategies of managing speech and language impairments depend on the Therapist's choice and the type of disorder, whether fluency problem, articulation problem, or voice problem and it also depend on the causative agents (Adediran, 2013). Sometimes, surgery is recommended before training commences. However, the therapist must put into consideration these strategies in managing speech and language impairment; Taking case history, Finding out the causative agents, Assessing and diagnosing the speech problem, Planning speech therapy and begin training with imitation techniques, using mirror, modelling, and frequent practice, Speech stimulations using real objects, pictures and story, Speech recordings of patient and correct speech samples, Using part to whole method like babbling method, Tadoma-vibration method, and the acoustic methods, Natural language methods can also be used where necessary.

3. Sign Language: Some children with hearing loss may use sign language as their primary mode of communication. Learning sign language from a qualified teacher can improve communication with deaf individuals and as a result, impact positively on their educational achievements. For example, in some cultures, hearing-impaired individuals may use non-spoken forms of communication such as sign language, which may require interviewers with different cultural backgrounds to their own.
4. Classroom accommodations: Children with hearing impairments may require classroom accommodations for optimum learning and participation in school activities. These may include learning materials with captions or subtitles, preferential seating, and the use of assistive listening devices (ASHA, 2002).
5. Educational Planning: The goal of educational planning is to design programs that maximize access to language and communication learning opportunities for children with hearing impairments. IEP (Individualized Educational Plans) have been developed specifically for educational planning for hearing-impaired children.
6. Hearing Conservation: This program aims to prevent significant, permanent hearing loss resulting from loud noise exposure to Ototraumatic agents. Hearing conservation provides for the identification and evaluation of noise hazards, control and reduction in noise in the workplace, and fitting of and training in the adequate use of personal hearing protective device; monitoring of hearing through audiometric testing, audiogram review, and follow-up, including referral as needed. Education of workers regarding the effects of noise on hearing and health; motivation of management and workers to be committed to a hearing conservation program; record keeping; and analysis of the program effectiveness.

Benefits of Psycho-Educational Assessments

Psycho-educational assessments for individuals with hearing impairment are numerous and offer several advantages, including:

1. Psycho-educational assessments designed explicitly for individuals with hearing impairment provide accurate measurements of cognitive and academic skills without relying on auditory input. This means that individuals with hearing impairment can demonstrate their true potential without being limited by their hearing loss.
2. Psycho-educational assessments also help to identify areas where individuals with hearing impairment may need additional support or accommodations. This information can be used to develop individualized education plans (IEPs) that meet the needs of each individual student.
3. The implementation of a standardized assessment, such as the Preschool Language Scale (PLS-5) for children aged 0-7 years old, and the Peabody Picture Vocabulary Test (PPVT-4) for children aged 2-18 years old, can help to evaluate the child's receptive and expressive language abilities (ASHA, 2013).
4. The implementation of psycho-educational interventions will create increased happiness, wellbeing positive cognitions and emotions.
5. The integration of assistive devices such as hearing aids, Frequency Modulator (FM) system, and sound field systems, which uses speakers can all be used to magnify/amplify sound which helps to enhance the individual's hearing.
6. It helps them accept their impairments and live a better life.
7. It helps them to recognize self-defeating patterns of feelings and emotions.
8. It helps the hearing impaired individual to have and maintain a good relationship with their families and friends.
9. Psycho-educational assessment helps them to adjust to the negative attitude of the society towards them.
10. Psycho-educational assessment helps these individuals to reduce the stress that comes with hearing impairment.

Challenges that impede Psycho-Educational Assessments

Despite the advantages, there are also some limitations to psycho-educational assessments for individuals with hearing impairment. Some of these limitations include:

1. **Lack of Standardization:** Many psycho-educational assessments for individuals with hearing impairment are not standardized, which can make it difficult to compare results across different tests.
2. **Limited Scope:** Psycho-educational assessments for individuals with hearing impairment may have a limited scope, focusing primarily on nonverbal cognitive and academic skills. This means that some important aspects of education and learning may be overlooked.
3. **Lack of trained personnel in the field of psycho-educational assessment for individuals with hearing impairment.**

4. Withdrawal: As an adverse effect of hearing impairment, persons who suffer this condition experience withdrawal from societal activities because of the inability to perceive and interpret speech sound. This challenge can pose serious impedance and interference to the intervention of the psycho-educational process.
5. Lack of adequate test instruments in the area of psycho-educational diagnosis.

Implications

The implications of psycho-educational assessments has two sides to it; the advantageous and the disadvantageous sides. The following are a combined itemization of the implications of psych-educational assessment of individuals with hearing impairments.

1. If adequate psycho-educational intervention is not carried out on these individuals, they will experience societal displacements.
2. The provision of assistive technology and accommodation to help ameliorate every stage of hearing impaired children's transitioning starting from basic education to tertiary education stages of life help to not retard their academic advancements.
3. These children will experience displacement in the inclusive academic setting if proper psycho-educational intervention is not carried out.
4. Psycho-educational assessment will holistically add to their proper growth and development.
5. It helps in the channeling of their abilities and strengths in various aspects of their lives.

Conclusion

Psycho-educational diagnosis and intervention for the hearing impaired is a complex and multifaceted process that requires specialized knowledge, skills, and training. The different concepts, factors, and strategies discussed in this chapter are important for developing effective intervention plans that can support the communication and learning needs of individuals with hearing loss. Furthermore, this chapter has highlighted the importance of psycho-educational assessment and intervention for children with hearing impairments. A comprehensive assessment of cognitive, behavioral, social-emotional, and language abilities is necessary to determine a child's functioning level and develop appropriate interventions. Cochlear implants, hearing aids, speech and language therapy, and assistive technology devices can improve communication abilities, with classroom accommodations like preferential seating, class notes, and captioned videos/audio. Additionally, Educational planning is crucial to maximize the potential of children with hearing impairments and guarantee their success at school. A comprehensive multidisciplinary team approach is critical in providing effective educational and psychological support for these children.

As thus, psycho-educational assessments for individuals with hearing impairment are critical tools for measuring cognitive and academic skills without relying on auditory input. These assessments provide accurate measurements of a student's abilities and help identify areas where additional support or accommodations may be needed. While there are some limitations to these assessments, they represent an important step forward in improving educational outcomes for individuals with hearing impairment and living healthy, happy, and productive lives.

Suggestions

When conducting psycho-educational assessments for individuals with hearing impairments, it's important to consider their unique needs and challenges. Here are some suggestions for such assessments:

1. Federal and state ministries of education in collaboration with SUBEB and the Universal Basic Education Board should maintain collaborations with hospital managements to come up with policies, legislation and standardized psycho-educational processes, blueprints and templates in order to assist in the identification, assessment and intervention for these children.
2. Teachers and other professionals are urged to use visual aids, such as written instructions, diagrams, or drawings, to supplement verbal instructions. This can enhance comprehension and ensure that the individual fully understands the assessment tasks; and ensure that a sign language interpreter or other communication support is provided to facilitate effective communication between the assessor and the student/individual with hearing impairment.
3. The Federal and state ministries of education in collaboration with SUBEB and the Universal Basic Education should invest in the training and retraining of professionals who specialize in working with individuals with hearing impairments to ensure the assessment process is comprehensive, fair, and inclusive.
4. Parents of children with hearing loss should be educated and trained towards the effective and careful management of their children's condition, as well as the use, application and maintenance of assistive devices. They should be encouraged to take part in programs that will promote awareness, career guidance and employment opportunities for individuals with hearing impairments, as this will help ameliorate the withdrawal effect.
5. The federal government, NGOs and SUBEB are urged to frequently participate in the funding and provision of standardized equipment such as quantum analyzer, hearing aids, cochlear implants, and other medical apparatus that can be used in special education programs across the country so as to aid in the psycho-educational treatment and skill development for children with hearing loss.

References

- Adediran, D.A. (2013). *A Manual on Speech and Language Therapy*. Lagos Awoleye Press.
- Agrawal, Y., Platz, E. A., & Niparko, J. K. (2017). *Prevalence of hearing loss and differences by demographic characteristics among us adults: Data from the National Health and Nutrition Examination survey, 1999–2004*. *Archives of Internal Medicine*, 168(14), 1522-1530.
- American Educational Research Association, American Psychological Association, and National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. American Educational Research Association.
- American Psychological Association (2010). *Publication manual of the American Psychological Association* (6th Ed.). Washington, DC: Author.
- American Speech-Language-Hearing Association. (2002). *Guidelines for audiology service delivery in schools [Guidelines]*. Retrieved from www.asha.org/policy.
- American Speech-Language-Hearing Association. (2013). *Guidelines and policies. Language assessments for children and youth*. <https://www.asha.org/policy/GL2013-00290/>
- Antonelli, P. J. (2018). *Anatomy and physiology of the auditory and vestibular systems*. In *Head and neck surgery: Otolaryngology* (pp. 95-116). Thieme.
- Babudoh, G. B. (2021). *Rudiments of audiology*: Jos: Adage Communications.
- Bakare C.A. (2013). *Hearing Disorders: Symptoms, diagnosis and management*. Ibadan: Book Builders Editions, Africa.
- Bess, F. H., & Humes, L. E. (2015). *Audiology: The fundamentals*. Plural Publishing.
- Brown, J. J., & Mehrabian, S. (2017). *Psycho educational assessment of deaf and hard-of-hearing students: Challenges and Innovations*. Routledge.
- Davis, J. M., & Elfenbein, J. (2010). *Psycho educational assessment and Intervention for hearing impaired individuals*. In J. H. Stone, M. Blouin, editors. *International Encyclopedia of Rehabilitation*. Available online: <http://cirrie.buffalo.edu/encyclopedia/en/article/155>.
- Dollaghan, C. A. (2004). Evidence-based Practice in Communication Disorders: What do we know, and when do we know it? *Journal of Communication Disorders*, 37(5), 391-400.
- Fan, X., Szymanski, C. A., & Brinkman, D. (2018). Advances in Psycho educational Assessment of Deaf and Hard of Hearing Children and Adolescents. *Journal of psychoeducational assessment*, 36(2), 123-136.
- Gargiulo, R. M. (2012). *Special education in contemporary society: An introduction to exceptionality* (4th Ed.). Thousand Oaks, CA: SAGE Publications.
- Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, 38(5), 581-586.
- Gresham, F. M., & Elliott, S. N. (1990). *The social skills rating system*. American Guidance Service.

- Gresham, F. M., & Elliott, S. N. (2008). *Social Skills Improvement System Manual*. Pearson. Individuals with Disabilities Education Act, 20 U.S.C. § 1400 et seq. (2004).
- Korbi, M., Amiri, S., & Roshanfekar, P. (2016). *Cognitive evaluation and intelligence quotient in hearing-impaired students*. *Electronic Physician*, 8(4), 2273–2277. <https://doi.org/10.19082/2273>
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression, anxiety, and stress scales* (2nd Ed.). Psychology Foundation of Australia.
- Luckner, J. L., & Cooke, C. (2010). Preparing teachers of students who are deaf or hard of hearing: A review of empirical studies. *Journal of Deaf Studies and Deaf Education*, 15(4), 348-365.
- Marschark, M., Sarchet, T., & Convertino, C. (2012). Social skills assessment in deaf individuals: A critical overview. *Journal of Deaf Studies and Deaf Education*, 17(1), 1-14. Doi:10.1093/deafed/enr025
- Marschark, M., & Spencer, P. E. (Eds.). (2003). *Oxford handbook of deaf studies, language, and education*. Oxford, UK: Oxford University Press.
- Morey, L. C. (1991). *Personality Assessment Inventory*. Psychological Assessment Resources.
- National Institute on Deafness and Other Communication Disorders (2014). *Hearing loss and older adults*. Retrieved from <https://www.nidcd.nih.gov/health/hearing-loss-older-adults>.
- National Institute on Deafness and Other Communication Disorders (2019). *Cochlear Implants*. Retrieved from <https://www.nidcd.nih.gov/health/cochlear-implants>
- Pindzola, R. H., Sheikh, S., & Smith, M. L. (2017). Assessment of cognitive abilities in deaf children: A critical review. *Journal of Deaf Studies and Deaf Education*, 22(2), 157-174. <https://doi.org/10.1093/deafed/enw069>
- Smith, R. J. H., Bale, J. F., & White, K. R. (2015). *Sensorineural hearing loss in children*. *The Lancet*, 365(9462), 879-890.
- Sparrow, S. S., Cicchetti, D. V., & Balla, D. A. (1984). *Vineland Adaptive Behavior Scales*. American Guidance Service.
- Traxler, C. B. (2000). The Stanford Achievement Test, 9th edition: National norming and Performance standards for deaf and hard-of-hearing students. *Journal of deaf studies and deaf education*, 5(4), 337-348.
- Van Gent, T., Goedhart, A. W., & Treffers, P. D. (2017). *Cognitive Assessment of deaf children: A Systematic review of assessment tools and their psychometric properties*. *Research in developmental disabilities*, 63, 135-149.
- Wiktionary (2023). Retrieved from <https://www.en.m.wiktionary.org>
- WHO (2020). *Hearing loss*. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/hearing-loss>

