

The Speech, Spatial and Qualities of Hearing in Hindi speaking Hearing Aid Users

Ms. Neha Yashfin

Post Graduate Student (MASLP)
Dr. M.V. Shetty College of Speech and Hearing
Malady Court, Kavoor, Mangalore-15

Dr. Vini Abhijith Gupta, Ph. D

Associate Professor
Dr. M.V. Shetty College of Speech and Hearing
Malady Court, Kavoor, Mangalore-15
Correspondence address: Ms. Neha Yashfin
Post Graduate Student (MASLP)
Dr. M.V. Shetty College of Speech and Hearing
Malady Court, Kavoor, Mangalore-15

Abstract

The Speech, Spatial and Qualities of Hearing Scale (SSQ12) is designed to measure a range of hearing disabilities across several domains. Particular attention is given to hearing speech in a variety of competing contexts, and to the directional, distance and movement components of spatial hearing. The present study aimed to assess the speech spatial and quality of hearing in Hindi-speaking hearing aid users. The Speech, Spatial and Qualities of Hearing Scale (SSQ12) questionnaire by Noble and Gatehouse (2003) was translated and adapted into the Hindi language. Data were collected from 20 Hindi-speaking individuals with moderate to severe sensorineural hearing loss (SNHL) in the age group of 25-50 years. The overall results reveal that speech spatial and quality of hearing are moderately affected in Hindi-speaking HA users.

Keywords: speech, spatial and qualities of hearing (SSQ12) of hearing in Hindi-speaking HA users

Date of Submission: 07-07-2023

Date of acceptance: 19-07-2023

I. INTRODUCTION

HL is one of the most common disabilities in the human population (Voss et al., 2016). As stated by the International Classification of Functioning, Disability and Health (ICF), speech understanding difficulties due to HL can negatively impact daily activities and participation in society, and consequently quality of life (World Health Organization, 2018).

The auditory system serves other functions besides speech hearing, such as the localization of sounds. The importance of this aspect of hearing has been argued for within the context of audiological rehabilitation (Byrne & Noble, 1998). In addition, people use hearing for identifying and distinguishing between audible events, both in daily listening contexts and in recreational ones, such as listening to music. Hearing has been characterized by Bregman (1990), using the concept of 'auditory scene analyses'. This construes the task of hearing as one of partitioning ('parsing') the various overlapping sound streams that a listener is typically confronted with, to recover a coherent array of signals.

Speech, spatial and qualities of hearing scale (SSQ) measures various domains of hearing disability. It assesses hearing in a variety of competing contexts, distance and movement components of spatial hearing, localization of sound, ability to segregate sounds and to attend to simultaneous speech streams, which reflects the reality of hearing in the everyday world. Quality of hearing experience includes clarity of listening, naturalness and ease of hearing. It takes into consideration the perception of both sound quality and spatial relationship; hence it is a very comprehensive measure of hearing disability. Sound sources are likely to occur from multiple directions and overlap which each other, the sounds are also dynamic, where sound sources move around and change rapidly, such environments are often challenging. In such an environment, listeners' effective functioning is required to focus and identify the sounds (Galvin & Noble, 2013).

Noble and Gatehouse (2004) conducted a study using speech, spatial and qualities of hearing scale (SSQ) on the interaural asymmetry of HL. The comparison was focused on self-rated disabilities reflected in responses

on the scale. The connections between SSQ ratings and a global self-rating of handicaps were observed. The result suggested that spatial hearing was severely disabled in the group with asymmetry across all SSQ domains. Hence SSQ shows promise in the assessment of outcomes in the case of bilateral versus unilateral amplification and implantation.

Douglas et al. (2007) used speech, spatial and qualities of hearing scale (SSQ), to characterize and quantify the auditory disabilities that patients experience with a profound unilateral HL after acoustic neuroma removal. Results showed the greatest difficulty was speech in the presence of noise, situations of multiple speech streams and switching the location of unseen objects, and increased listening efforts.

Noble et al. (2013) developed and evaluated 12 item versions of speech, spatial and qualities of hearing scale for use in clinical a rehabilitation setting and the result revealed similar results to the SSQ of 49 question version.

Valiyakath, Gupta and Shany (2017) reported that speech, spatial and qualities of hearing scale in SNHL that indicates individuals with moderate to severe SNHL have persistent issues with speech spatial and qualities of hearing.

Arun and Shany (2017) studied speech, spatial and qualities of hearing in tea factory workers. The study revealed that there is a significant difference between the participants with normal hearing sensitivity, unilateral HL and bilateral HL. Overall results indicate that speech spatial and quality of hearing are majorly affected in participants who are working in noise. The result suggested that disability measures provide additional information about the hearing status compared with the behavioural impairment measures.

Kumaraswamy (2022) studied speech, spatial and quality of hearing scales in Malayalam-speaking individuals with bilateral moderate to severe SNHL using HA for 2 years. The results suggested that disability measures provide additional information about the hearing status compared with the behavioural impairment measures.

Kumar, Kumaraswamy and Gupta (2019) examined speech, spatial and quality of hearing in adolescents, adults and geriatrics. The results indicated that speech, spatial and quality of hearing are most affected in the geriatric population.

II Aim of the study

From the above literature, it is evident that speech, spatial and qualities of hearing are affected in SNHL and how the SSQ12 scale is effectively used in assessing different conditions like speech in noise, localization, multiple speech streams, listening effort etc. Previous studies were carried out in South Indian languages like Kannada (Valiyakath, Gupta & Shany) and Malayalam (Arun & Shany, 2017; Kumar, Gupta, Kumaraswamy, 2019; Kumaraswamy, (2022) to assess speech, spatial and qualities of hearing are affected in SNHL, but a few or limited studies were conducted to study the same in the Hindi language. Hence the present study aims to assess the speech spatial qualities of hearing in Hindi-speaking HA users using the Hindi SSQ12 scale which was translated and adapted from the SSQ12 scale by Nobel and Gatehouse (2003).

II. METHOD

A. Participants:

20 individuals of the 25-50 age group with moderate to severe SNHL are included in the present study. The exclusion criteria were individuals who had any health problems any noticeable cognitive changes or other neurological changes and who were unable to use HA.

B. Stimuli

The speech spatial and quality questionnaire (SSQ,12) given by Noble and Gathouse (2003), translated and adapted into Hindi language and validated by 5 speech-language pathologists (SLP) whose native language was Hindi. 12 questions based on speech in noise, hearing in multiple speech streams, localization, distance and movement, segregation, identification of sound, quality and naturalness, a listening effort was used in the study.

C. Procedure

A total of 20 individuals with moderate to severe SNHL in the age range of 25- 50 years were taken for the study. All participants were explained in detail about the purpose of the study. They were also given a brief introduction to the SSQ12 questionnaire and asked to respond to each question based on 0-10 where 0 was difficulty and 10 was no difficulty.

D. Statistical Analysis

The collected data were summarized by using Descriptive Statistics: frequency, percentage; range, mean and Standard Deviation. Data were analyzed by using the SPSS software (SPSS Inc; Chicago, IL) Scores obtained from the individuals were analyzed and the results were discussed below.

III. RESULT AND DISCUSSION

This study is focused on evaluating the hearing quality and speech spatial abilities of Hindi-speaking individuals who use HA and have moderate to SNHL. The age range of the participants is between 25 to 50 years old. The obtained data were analyzed and the results are discussed below.

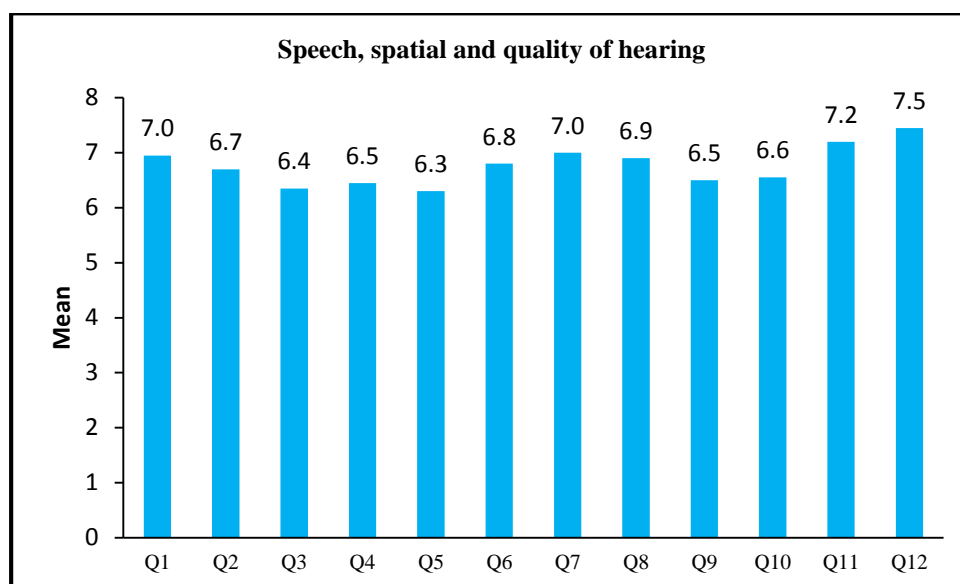


Figure 1: showing the mean scores of speech, spatial and quality of hearing in individuals with hearing aid users.

Figure 1, shows the mean score for questions 1 to 12 of SSQ 12 which shows a variation in the mean scores ranging from (6.3) to (7.5) for the questions. The highest mean score was seen for Q12 (7.5) followed by Q11 (7.2), Q1, Q7 (7), Q8 (6.9), Q6 (6.8), Q2 (6.7), Q10 (6.6), Q9, Q4(6.5), Q3 (6.4) and Q5 (6.3).

	Mean
Multiple speech streams	6.3
Speech in noise	6.5
Segregation	6.6
Localization	6.8
Distance and movement	6.9
Identification of sound	7
Quality and naturalness	7.2
Listening effort	7.5

Table 1: showing the mean scores of different areas of speech spatial and quality in subjects with hearing aid in both ears.

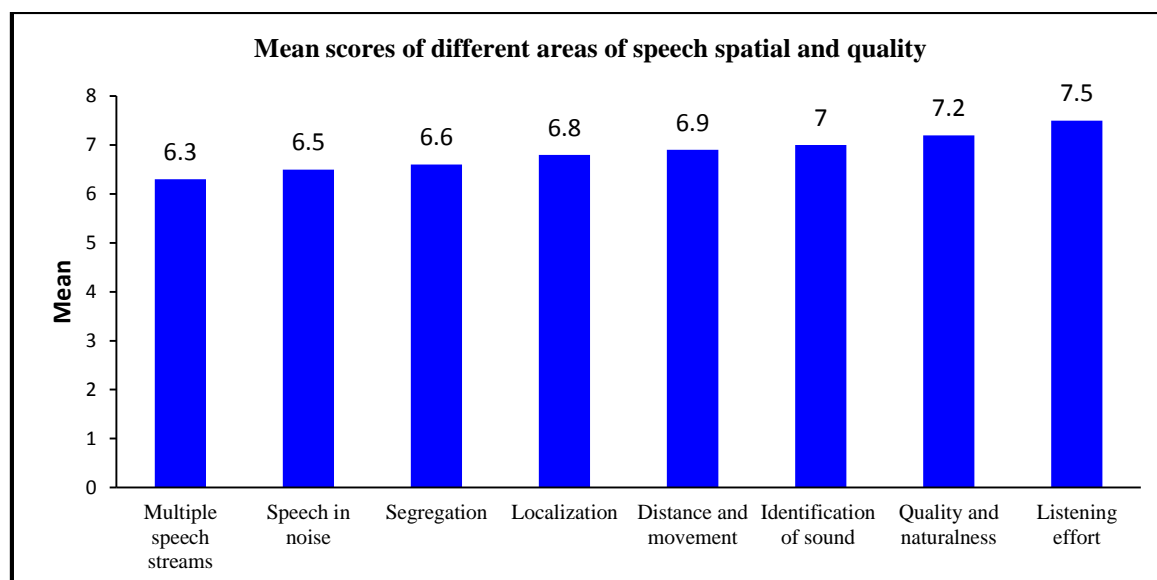


Figure 2: showing mean scores of areas of speech, spatial and quality in subject with a hearing aid in both ears.

From the above table 1 and figure 2, it is very evident that the highest mean scores were seen for listening effort (7.5), followed by speech in noise, quality and naturalness, segregation, identification of sound, multiple speech streams, distance and movement and localization.

The above results revealed that speech, spatial and quality of hearing are affected in individuals with severe SNHL using HA bilaterally. Results of the current study are in agreement with previous Indian studies by Valiyakath, Gupta and Shany (2017); Arun and Shany (2017); Kumaraswamy (2022); Kumar, Kumaraswamy and Gupta (2019) who reported that SSQ12 scores are lower in individuals with SNHL.

IV. CONCLUSION

To conclude, the Hindi SSQ12 scale is an effective tool to assess the speech, spatial, and quality of hearing in individuals with SNHL which will help in better aural rehabilitation and thereby improve the quality of their life.

REFERENCES

- [1]. Arun., Shany, B. (2017) Speech, spatial and qualities of hearing in tea factory workers. Unpublished master dissertation, Mangalore University, Mangalore, India
- [2]. Byrne, D., Sinclair, S., Noble, W. (1998). Open ear mould fitting for improving aided sound localization for sensorineural hearing loss with good high-frequency hearing. *Ear and hearing* 19(1),62-71.
- [3]. Douglas, S. A., Yeung, P., Daudia, A., Gatehouse, S., & O'Donoghue, G. M. (2007). Spatial hearing disability after acoustic neuroma removal. *The Laryngoscope*, 117(9), 1648-1651
- [4]. Gatehouse S., Noble W. (2004): The Speech, Spatial and Qualities of Hearing Scale, *Int. J. Audiol.* 43(2), 85-99.
- [5]. Kumar, G. B., Kumaraswamy, S., Gupta, V. A. (2019) Speech, Spatial and Quality of Hearing in Adolescence, Adult and Geriatrics. *Language in India* www.languageinindia.com ISSN 1930-2940 19:5 May 2019 _ Dissertation
- [6]. Kumaraswamy, S. (2022) Speech, spatial and qualities of hearing in hearing aid users. *International Journal of Research in Engineering and Science (IJRES)* ISSN (Online): 2320-9364, ISSN (Print): 2320-9356 www.ijres.org Volume 10 Issue 10 | October 2022 | PP. 451-457
- [7]. Noble, W., Jensen, N. S., Naylor, G., Bhullar, N., & Akeroyd, M. A. (2013). A short form of the Speech, Spatial and Qualities of Hearing scale suitable for clinical use: The SSQ12. *International Journal of audiology*, 52(6), 409-412. [21].
- [8]. Valiyakath, S, Gupta, V.A, Shany, B. (2017) Speech, spatial and qualities of hearing scale in sensorineural hearing loss. Unpublished master dissertation, Mangalore University, Mangalore, India.
- [9]. Voss, P. (2016). Auditory spatial perception without vision. *Frontiers in Psychology*, 7.