

Self-Assessment of Communication by Individuals with Precipitous Hearing Loss

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Forty adult males with precipitous high-frequency hearing losses primarily associated with excessive noise exposure completed the Self-Assessment of Communication (SAC) scale of hearing disability and handicap. Subjects in the 2-kHz (normal hearing through 2000 Hz) and the 1-kHz (normal hearing through 1000 Hz) groups reported some degree of hearing disability and handicap, with the 1-kHz group total scores for the SAC being significantly higher. An analysis of the 10 individual SAC items indicated that all contribute in varying degrees to the total score, with the communication-related items (disability) having the highest sample mean responses. The 1-kHz group mean responses were significantly higher for Items 1, 2, 3, 5, and 8. The SAC appears useful in quantifying the hearing disability and handicap perceived by individuals with noise-induced precipitous hearing losses, and the additional information gained from its use should be helpful in counseling and planning audiologic rehabilitation for patients with this type of hearing loss.

As interest in and the use of self-assessment scales with the hearing impaired have increased (Schow, Balsara, Smedley, & Whitcomb, 1993), so too has the desire to evaluate the extent to which various audiometric measures may accurately predict hearing disability and handicap. Numerous investigations, as reviewed by Giolas (1982) and Erdman (1994), have demonstrated pure-tone and speech-audiometric measures generally are not strongly correlated with self-report mea-

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asures of hearing difficulties. Consequently a comprehensive hearing assessment, as perceived by an increasing number of audiologists, should incorporate both conventional audiometric and self-assessment measures (Erdman, 1994). Audiometric testing provides a direct measure of hearing impairment, whereas self-assessment instruments yield valuable information regarding the extent of hearing disability and/or handicap that exists for an individual with hearing loss and provide insights concerning the need for audiologic intervention. Both sources of information are essential for comprehensive and relevant patient management.

Individuals with precipitous sensorineural hearing loss, commonly observed with noise-related impairments, can present special problems with respect to identifying receptive communication difficulties by means of conventional audiometric procedures. Although pure-tone results quantify the extent of hearing impairment present in the high-frequency region, in such cases conventional word-recognition testing often suggests little, if any, decreased performance in speech perception (Wiley, Stoppenbach, Feldhake, Moss, & Thordardottir, 1995). Thus, the audiometric results may not be completely consistent with the persistent observations made by some individuals with precipitous high-frequency hearing loss about difficulties they are experiencing in understanding speech. In this instance the use of a self-assessment scale of hearing disability and/or handicap may prove to be valuable, as it may be a means by which the degree of difficulties experienced by the person can be identified and quantified.

The extent to which self-assessment scales are sensitive to the hearing disability and handicap experienced by individuals with varying degrees of hearing loss featuring a precipitous drop in the high frequencies has yet to be explored extensively. Schow, Brockett, Sturmak, and Longhurst (1989) found a predictable relationship between various degree of hearing loss/audiogram configuration categories and self-assessed hearing handicap, but their study did not focus specifically on sharp precipitous loss. Therefore, the purpose of this investigation was to evaluate further the extent to which varying amounts of precipitous, high-frequency, sensorineural hearing loss may be associated with self-perceived hearing disability and handicap.

METHOD

Subjects

The files of a university clinic and a private practice were reviewed to identify the first 40 cases with case histories, audiograms, and tympanograms highly consistent with noise-induced sensorineural hearing loss to serve as subjects. A hearing disability/handicap scale, the Self Assessment of Communication (Schow & Nerbonne, 1982), also must have been completed when the patient was evaluated initially. The 40 subjects, all adult males, were placed into one of two groups based on the extent of their hearing impairment in the high frequencies. The

2-kHz group was comprised of 20 individuals (mean age of 55.3 years, $SD = 8.7$) exhibiting high-frequency sensorineural hearing loss bilaterally with thresholds of 25 dB HL (American National Standards Institute, 1989) or better from 250-2000 Hz and thresholds of 40 dB HL or worse at 4000 Hz. The 1-kHz group also had 20 individuals (mean age of 59.3 years, $SD = 8.7$) possessing high-frequency sensorineural hearing loss bilaterally with thresholds in each ear of 25 dB HL or better from 250-1000 Hz and thresholds of 40 dB HL or worse at 2000 Hz. No subject in either group had asymmetry in thresholds between ears that exceeded 15 dB. Figure 1 presents the mean better ear air conduction pure tone thresholds of each group.

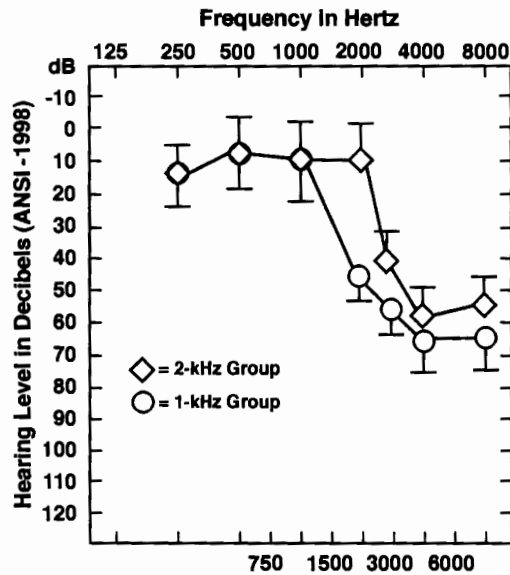


Figure 1. Mean air conduction pure-tone thresholds and standard deviations (better ear) for subjects in the 2-kHz and 1-kHz groups.

Procedure

The nature and extent of noise exposure was ascertained as a part of a detailed case history. Air and bone conduction pure-tone thresholds were then obtained bilaterally at the octave frequencies from 250-4000 Hz, plus 3000 and 8000 Hz via air conduction, and tympanograms were also obtained for each ear. Finally, the Self-Assessment of Communication (SAC) scale of hearing disability and handicap (Schow & Nerbonne, 1982) was administered. The SAC is a brief 10-item inventory (see Appendix) that evaluates both the disability and handicap hearing domains (World Health Organization, 1980). Data regarding the reliabil-

ity and validity of this scale have been presented in numerous sources (American Speech-Language-Hearing Association, 1996; McCarthy & Sapp, 1993; Schow, Smedley, & Longhurst, 1990).

RESULTS AND DISCUSSION

The overall mean SAC raw score for the 2-kHz group was 20.4 ($SD = 8.2$), and the 1-kHz group had an overall mean score of 27.5 ($SD = 9.4$). These scores indicate both groups perceive some degree of hearing disability and handicap. Based on the higher SAC score for the 1-kHz group it is also clear that self-perceived hearing disability and handicap, as measured by the SAC, escalate as the test frequency where the precipitous drop associated with noise-induced hearing loss shifts from 4000 to 2000 Hz. A t test for independent groups indicated that the overall mean SAC raw scores for the two groups were significantly different, $t(19) = 2.54, p = .015$. These findings generally are consistent with the results reported by Schow et al. (1989) with the SAC.

To further explore the SAC hearing disability and handicap data, means for each of the 10 individual scale items were computed and are shown in Figure 2. Subjects in both groups generally reported more difficulty with scale items associated with disability-related communication situations (1-6), particularly Item 5

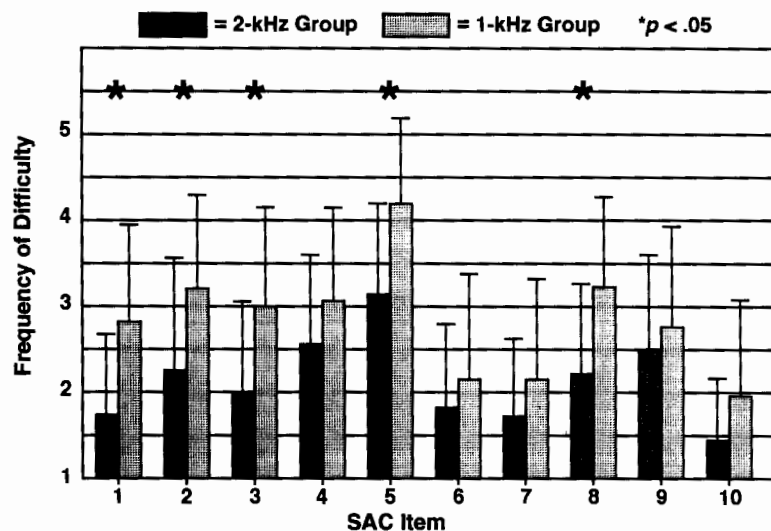


Figure 2. Means (1 = Almost Never; 5 = Almost Always) and standard deviations for each of the 10 items on the Self Assessment of Communication (SAC) for the 2-kHz and 1-kHz groups. Group means were significantly different (*) for Items 1, 2, 3, 5 and 8 ($p < .05$).

(listening in unfavorable environments) than for the socioemotional issues probed in Items 7-10 (handicap). However, subjects in the 1-kHz group consistently reported more disability and handicap throughout the SAC. In fact, 1-kHz group means for all 10 items of the SAC exceeded those for the 2-kHz group and *t* tests showed that the differences were significant ($p < .05$) for Items 1, 2, 3, 5, and 8. Although the SAC results reflected some degree of disability and handicap for both groups, it is apparent that it was sensitive particularly to the increased communication difficulties (disability) that were perceived by the subjects in the 1-kHz group. The significant differences found in both total and individual item scores for the SAC further reinforces the important contribution that hearing sensitivity in the 1000-2000 Hz region has in determining the extent of hearing disability and handicap a given individual may experience.

SUMMARY

Individuals with precipitous high-frequency sensorineural, noise-induced, hearing losses consistently report some degree of hearing disability and handicap, as measured by the SAC. Results indicate significantly more difficulties are reported if the precipitous drop in hearing sensitivity involves 2000 Hz. All of the items on the SAC appear to contribute to some degree to the increased disability and handicap score these individuals report, particularly those items directly associated with communication situations commonly encountered. Thus, the SAC is sensitive to difficulties perceived by individuals with precipitously dropping audiograms associated with noise-induced hearing loss, even in instances where the hearing loss exists only above 2000 Hz. Consequently, its use can provide valuable insight for the clinician regarding the hearing difficulties experienced by many persons with this commonly encountered type of hearing loss that conventional word-recognition testing often does not. Furthermore, self-assessment information may be particularly effective in convincing an individual with a precipitous hearing loss that his/her communication difficulties warrant consideration of hearing aids and other relevant forms of audiologic rehabilitation.

ACKNOWLEDGMENTS

Portions of this article were presented at the 1997 National Hearing Conservation Association Annual Conference, Orlando, FL.

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APPENDIX

SELF-ASSESSMENT OF COMMUNICATION QUESTIONNAIRE

Name _____ Date _____

One of the following five descriptions should be assigned to each of the statements below.
 Select a number from 1 to 5 next to each statement (do not answer with *yes* or *no*).

- 1) Almost Never (or Never)
- 2) Occasionally (About 1/4 of the Time)
- 3) About 1/2 of the Time
- 4) Frequently (About 3/4 of the Time)
- 5) Practically Always (or Always)

Various Communication Situations	Check Number Below
1. Do you experience communication difficulties when speaking with one other person? (For example, at home, at work, with a waitress, store clerk, spouse, boss, etc.)	1 2 3 4 5
2. Do you experience communication difficulties when conversing with a small group of people? (For example, with friends, family, or co-workers, in meetings or casual conversations, over dinner or while playing cards, etc.)	1 2 3 4 5
3. Do you experience communication difficulties while listening to a large group? (For example, at church or in a civic meeting, in a fraternal or women's club, at an educational lecture, etc.)	1 2 3 4 5
4. Do you experience communication difficulties while participating in various types of entertainment? (For example, movies, TV, radio, plays, night clubs, musical entertainment, etc.)	1 2 3 4 5

5. Do you experience communication difficulties when you are in an unfavorable listening environment? (For example, at a noisy party, where there is background music, when riding in an auto or bus, when someone whispers or talks from across the room, etc.)	1 2 3 4 5
6. Do you experience communication difficulties when using or listening to various communication devices? (For example, telephone, telephone ring, doorbell, public address system, warning signals, alarms, etc.)	1 2 3 4 5

Feelings about Communication

7. Do you feel that difficulty with your hearing limits or hampers your personal or social life?	1 2 3 4 5
8. Do problems or difficulty with your hearing upset you?	1 2 3 4 5

Other People

9. Do others suggest that you have a hearing problem?	1 2 3 4 5
10. Do others leave you out of conversations or become annoyed because of your hearing?	1 2 3 4 5

Note. From "Communication Screening Profile: Use With Elderly Clients" by R.L. Schow and M.A. Nerbonne, 1982, *Ear and Hearing*, 3, p. 135-147.