

Considerations in Measuring Effectiveness of Group Audiologic Rehabilitation Classes

Diane M. Brewer

The George Washington University

The Hearing Handicap Inventory for Adults (HHIA) was administered pre- and post-audiologic rehabilitation classes to assess the effectiveness of a group audiologic rehabilitation program which included communication training, coping strategies, and informational and counseling components. Clinically significant differences were seen in 22.8% of the participants, with both increase and decrease in perceived handicap. The usefulness of this and other methods to evaluate treatment effectiveness is discussed.

INTRODUCTION

The purpose of audiologic rehabilitation is to alleviate situations of handicap experienced by individuals who have a hearing impairment (Gagné, 1998). One component of audiologic rehabilitation used alone or in conjunction with a hearing aid fitting is a communication course or audiologic rehabilitation therapy program. The goals of such intervention are to enhance communication ability; increase knowledge concerning hearing loss, hearing aids, and assistive listening devices; and facilitate adjustment to hearing loss and hearing aid use in an effort to reduce the communication handicap experienced by persons with hearing loss. Service delivery of audiologic rehabilitation treatment to adults may be problematic from the point of view of both the client and the audiologist. There are several reasons that make audiologic rehabilitation treatment difficult, some of which are realizing the value and arranging transportation. The value of service provision may not be evident on an individual basis; therefore, a group model is appealing so that participants increase their learning by mutual interactions.

Correspondence concerning this article should be addressed to Diane M. Brewer, Associate Professor, Speech and Hearing Science, The George Washington University, 2201 G. Street, NW, Room 421, Washington, DC 20052. Electronic mail may be sent via Internet to dmb@gwu.edu.

Whether individual or group sessions, audiologists still need to have evidence of the benefits of providing organized sessions of audiologic rehabilitation.

Documentation of the effectiveness and efficiency of audiologic rehabilitation for adults has been an ongoing research focus. One method of documenting treatment effectiveness has been determination of a reduction in the psychosocial effects of hearing impairment as a result of treatment. Reduction in perceived handicap may be an indication of benefit from audiologic rehabilitation.

Several researchers have used self-assessment of perceived handicap to assess group therapy outcome. Abrams, Hnath-Chisolm, Guerreiro, and Ritterman (1992) studied whether participation in a counseling-based audiologic rehabilitation program would reduce the perception of hearing handicap as measured by the Hearing Handicap Inventory for the Elderly (HHIE; Ventry & Weinstein, 1982). Participation in a 3-week, counseling-based audiologic rehabilitation program in addition to hearing aid use provided significantly greater reduction of self-perceived handicap than hearing aids alone as an intervention. Primeau (1997) reported a significant reduction in self-perceived handicap on the Hearing Handicap Inventory for the Elderly – Shortened or Hearing Handicap Inventory for Adults – Shortened (Newman, Weinstein, Jacobson, & Hug 1991) following counseling-based audiologic rehabilitation sessions in a group of veterans who had not seen decreased handicap with hearing aids alone. Beynon, Thornton, and Poole (1997) used the Quantified Denver Scale to assess benefit of a 4-week communication course. They found a reduction in handicap for both the experimental (hearing aids and communication course) and the control group (hearing aids only), with a significantly greater reduction for the group that completed the communication course. The HHIE was also used in a study designed to examine the effectiveness of two intervention procedures: analytic auditory training and active listening training provided individually over a period of 4 weeks (Kricos & Holmes, 1996). Although other measures showed improvement for the active listening intervention, no significant reduction in hearing handicap was seen on the HHIE as a result of intervention. Abrahamson (1991) failed to find significant differences in pre- and post-testing with the Hearing Performance Inventory (Giolas, Owens, & Schubert, 1979) and the HHIE in a 4- to 8-week program teaching coping strategies. Kricos, Holmes, and Doyle (1992) used the HHIE to compare a group of elderly adults with hearing impairment who participated in a 4-week communication-training program that emphasized situational and linguistic cues as compared to a control group with no training. They found no significant difference between the experimental and control groups.

The purpose of the study was to evaluate the effectiveness of an 8- to 10-week group audiologic rehabilitation program including skills training, communication strategies training, and informational counseling using a self-report measure of perceived handicap. The program studied was longer than most previously reported (15-16 hr over a period of 2 to 3 months) and devoted more time to com-

munication skills (speech reading and auditory-visual listening training). It was hypothesized that participation in these classes over the 2-month period would decrease perceived handicap because of increased opportunities to reinforce and practice skills.

METHOD

Participants

Participants were 35 adults ranging in age from 29-89 years with a mean age of 73 years. Twenty-five were females and 10 were males. In all groups, participants were heterogeneous with regard to their stage of intervention regarding their hearing loss. Some had worn hearing aids for years and others were resisting the idea of hearing aid use. Current threshold audiograms were not available on all participants. Of the 26 participants providing audiograms, most had high-frequency, sensorineural hearing loss. Three participants had moderate, mixed hearing loss and 1 subject had a profound, mixed hearing loss. Of the 35 participants, 19 wore hearing aids. All participants reported difficulty hearing in noisy group listening situations. A flyer announcing the class was given to potential participants in the clinic and the classes were listed in the course offerings of the off-campus facilities. There was a charge for classes that varied by site. At the university clinic, the course was included in the hearing aid fee. At the off-campus programs, a fee was paid to that site. Although participation of significant others was encouraged, none participated.

Program

The audiologic rehabilitation program consisted of group classes that were offered by The George Washington University Audiology Clinic at their clinic and at two community centers designed to provide continuing education for adults over 50. Groups had from 4 to 10 participants. Classes met weekly for 1½- or 2-hr sessions over a period of 8 to 10 weeks. Two graduate students in Speech-Language Pathology and Audiology provided the instruction in the groups with direct supervision by a certified audiologist. Classes covered the following areas:

1. Speechreading training: analytic and synthetic
2. Auditory-visual listening training in noise
3. Hearing education topics: hearing loss, audiograms, hearing aids, and assistive listening devices
4. Coping with hearing loss
5. Communication strategies: anticipatory, environmental, and repair

Each class had educational, skills training, and coping with hearing loss components. Materials were prepared by the clinicians. Analytic speech reading was completed using nonsense syllable drills. Synthetic speechreading and auditory-

visual training in noise were taught using materials based on current events and client special interests. The coping with hearing loss portion of the class included discussion of problems in communication situations, brainstorming how to improve individual's difficult listening situations, and effective use of communication strategies.

Effectiveness Measure

The Hearing Handicap Inventory for Adults (HHIA; Newman, Weinstein, Jacobson, & Hug, 1990) is a self-report measure designed to assess the perceived social/situational and emotional consequences of a hearing impairment. It is a modification of the HHIE which substitutes three questions deemed more appropriate for younger participants. In the present study, the HHIA was chosen due to the age span of participants in the groups and the fact that those over age 65 were either employed or functionally employed with volunteer activities. The HHIA is a 25-item self-assessment scale composed of a 13-item emotional scale and 12-item social/situational scale with high test-retest reliability (Newman et al., 1991). Items were scored as 4, 2, or 0 points for *yes*, *sometimes*, or *no* answers, respectively. Scores for the total test can range from 0-100 (emotional scale 0-52 and social/situational scale 0-48) with a higher score representing greater self-perceived handicap. The 95% critical difference for the HHIA is 12 points (Newman et al., 1991). The HHIA was administered as a pencil and paper task, with clinician consultation as needed, during the first and the final class session.

RESULTS

Mean, standard deviation, and range values for the HHIA pre- and post-treatment are shown in Table 1. Scores that are lower on the HHIA indicate less perceived handicap. Mean group performance showed minimal change in HHIA scores. The changes post-treatment for individual participants are shown in Figure 1. Perceived handicap changes were in both the positive and negative direction. Of the 35 participants, 19 showed decreased HHIA scores, 14 of the participants showed increased HHIA scores, and 2 participants showed no change. Using the 95% critical difference of 12 points for clinical significance, 8 out of the 35 participants (22.8%) showed significant change in self-perceived handicap. Significant reduction was seen in 5 participants and significant increase in perceived handicap was seen in 3 participants. It is interesting to note that the initial HHIA score for those who showed an increase in perceived handicap was greater (44.7) compared to the mean score of those who showed a decrease (35.6).

Hearing aid status and hearing loss varied in both participants showing a decrease and an increase in perceived handicap. For those participants who showed decreased handicap, 3 were long-term hearing aid users, 1 was a new hearing aid user, and 1 did not use amplification. For the participants who showed an in-

Table 1
Means, Ranges, and Standard Deviations of Hearing Handicap Inventory for Adults Scores
Pre/Post Audiologic Rehabilitation Course

	Pre-test	Post-test	Change
Total			
Mean	31.60	30.69	0.91
Range	4-62	4-78	+18 to -20
SD	14.66	16.63	8.80
Emotional			
Mean	16.15	14.81	1.34
Range	4-30	0-34	+10 to -10
SD	7.98	9.37	-1.39
Social/Situational			
Mean	16.74	16.07	0.67
Range	0-38	4-44	+18 to -14
SD	9.28	9.66	-0.38

crease in perceived handicap, 2 were long-term hearing aid users and 1 did not wear hearing aids. The hearing loss ranged from mild to severe in both those who showed a decrease and those who showed an increase in perceived handicap. Informal questioning of the groups suggests that perceived handicap increased because the participants had become more conscious of their communication breakdowns. For example, people reported that as they tried to implement their speechreading and repair strategies they realized how often they had difficulty.

DISCUSSION

Group findings suggest little change in perceived handicap as a result of treatment. Inspection of individual post-treatment scores revealed wide variation in both directions and raised additional questions regarding interpretation of results. While a decrease in perceived handicap may be interpreted as a benefit of intervention, the increase in perceived handicap might not be evaluated in a negative way. Increased awareness of communication difficulty might provide motivation for taking steps to deal with the problems associated with hearing loss. Participants in the courses demonstrated other behaviors that may indicate effectiveness. For example, at the outset of the classes, current audiograms were available on only 21 of the participants. Five participants obtained audiological evaluations as a result of class discussions. Four participants sought hearing aid evaluations and 4 participants purchased assistive listening devices as a result of the class. One of the participants who showed a clinically significant increase in perceived handicap pursued an assistive listening device.

How can we evaluate the success or effectiveness of our programs? What are

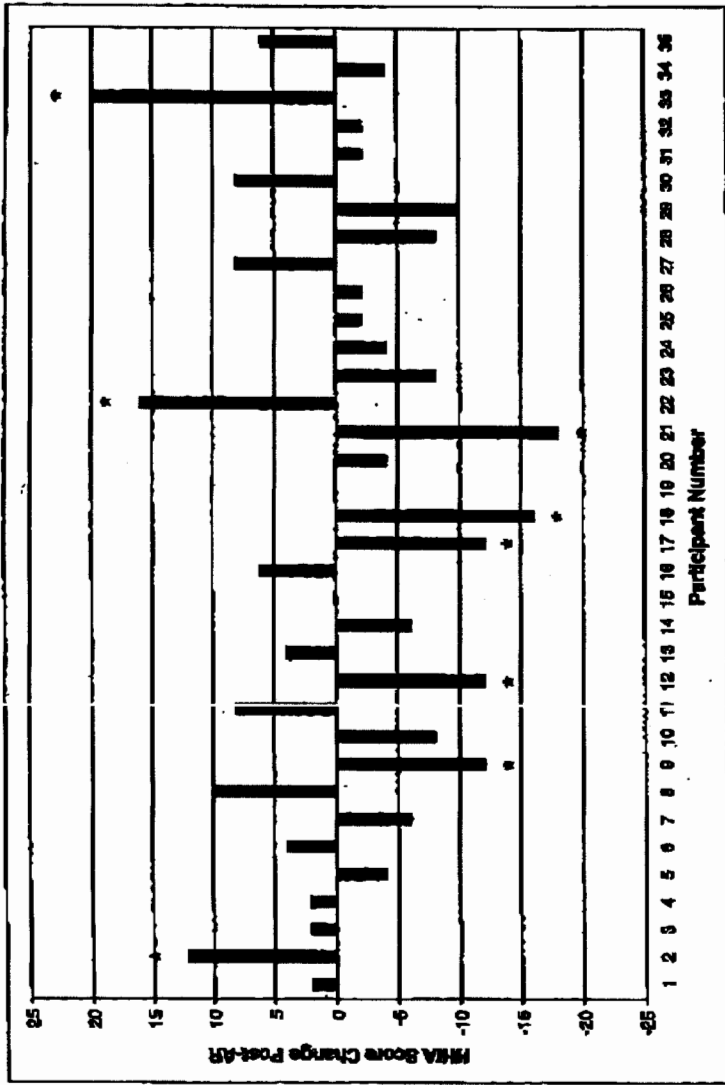


Figure 1. Post-treatment change in Hearing Handicap Inventory for Adults (HHIA) scores for individual participants. *Note.* AR = Audiologic Rehabilitation; * = clinically significant change.

other possible indicators of positive outcomes of such programs? Based on the present group data one might conclude that perception of handicap is not a good measure of effectiveness or that an audiologic rehabilitation course is not effective. Several other possibilities exist. Abrams et al. (1992) showed statistically significant improvement for the group received hearing aids and audiologic rehabilitation, while clinically significant results were seen in only 5 of the 11 participants. Primeau (1997) found clinically significant improvement in 89% of the participants. Several previous researchers (Abrahamson, 1991; Kricos & Holmes, 1996; Kricos et al., 1992) reported no significant reduction in hearing handicap on the HHIE for the treatment group. It is possible that evaluating individual data would be more productive.

The benefits of audiologic rehabilitation may be unique to each person and thus group changes may not be realized. Increased perceived handicap might be construed in a positive light if it results in greater awareness of communication needs and efforts to seek treatment. The fact that some decrease and others increase in self-perceived handicap may also highlight the need for more individual measures of outcome. Recent revisions in the World Health Organization classification system lead us to rethink audiologic rehabilitation as an individual problem-solving program. Stephens, Jones, and Gianopoulos (2000) suggested that this current thinking "leads us to an emphasis of the uniqueness of the set of problems for which a particular person is seeking help and raises the question as to whether general outcome measures are valid on an individual basis" (p. 15S). Gagné (2000) suggested that outcomes must address the individual concerns and needs of the consumers. Subject specific scales such as the Client Oriented Scale of Improvement (COSI; Dillon, James, & Ginis, 1997) and Glasgow Profile of Hearing Aid Benefit (GHABP; Gatehouse, 1999) might be more useful as outcome measures. Another possibility is to use a variety of changes in specific behaviors as an indicator of effectiveness including: audiological evaluation sought, hearing aid evaluation sought, assistive devices purchased, evaluation of improvement by communication partners, tests of performance on visual skills, test of knowledge of hearing health education modules, increased frequency of active participation in communication situations, or increased speed of communication transactions.

CONCLUSIONS

The HHIA results were highly variable for this population. The pre- to post-treatment scores changed in both a positive and negative direction with clinically significant improvement for 5 participants. Three participants showed significantly increased perceived handicap. It is possible that an increase in perceived handicap may be the result of increased awareness of communication difficulty. This increased awareness may ultimately lead to behavioral changes that will facilitate communication ease. The benefits of audiologic rehabilitation are unique

to each person and thus group changes may not be evident. Benefit from audiologic rehabilitation may not be seen without the use of more individual measures. Individual behavioral change may be a useful indicator of benefit. More open-ended questionnaires such as the COSI (Dillon et al., 1997) and GHABP (Gatehouse, 1999) may be useful for documenting changes that occur as a result of training. Further evaluation of these measures or a combination of measures to assess benefit from audiologic rehabilitation is warranted.

REFERENCES

- Abrahamson, J. (1991). Teaching coping strategies: A client approach to aural rehabilitation. *Journal of the Academy of Rehabilitative Audiology*, 24, 43-53.
- Abrams, H.B., Hnath-Chisolm, T., Guerreiro, S.M., & Ritterman, S. (1992). The effects of intervention strategy on self-perception of hearing handicap. *Ear and Hearing*, 13, 371-377.
- Beynon, G.J., Thornton, F.L., & Poole, C. (1997). A randomized, controlled trial of the efficacy of a communication course for first time hearing aid users. *British Journal of Audiology*, 31, 345-351.
- Dillon, H., James, A., & Ginis, J. (1997). Client Oriented Scale of Improvement (COSI) and its relationship to several other measures of benefit and satisfaction provided by hearing aids. *Journal of the American Academy of Audiology*, 8, 27-43.
- Gagné, J.-P. (1998). Reflections on evaluative research in audiological rehabilitation. *Scandinavian Audiology*, 27(Suppl. 49), 69-79.
- Gagné, J.-P. (2000). What is treatment evaluation research? What is its relationship to the goals of audiological rehabilitation? Who are the stakeholders of this type of research? *Ear and Hearing*, 21, 60S-73S.
- Gatehouse, S. (1999). Glasgow Hearing Benefit Profile: Derivation and validation of a client-centered outcome measure for hearing-aid services. *Journal of the American Academy of Audiology*, 10, 80-103.
- Giolas, R., Owens, E., & Schubert, E. (1979). Hearing Performance Inventory. *Journal of Speech and Hearing Disorders*, 44(2), 169-195.
- Kricos, P., & Holmes, A. (1996). Efficacy of audiologic rehabilitation for older adults. *Journal of the American Academy of Audiology*, 7, 219-229.
- Kricos, P., Holmes, A., & Doyle, D. (1992). Efficacy of a communication training program for hearing-impaired elderly adults. *Journal of the Academy of Rehabilitative Audiology*, 25, 69-80.
- Newman, C., Weinstein, B., Jacobson, G., & Hug, G. (1990). The Hearing Handicap Inventory for Adults: Psychometric adequacy and audiometric correlates. *Ear and Hearing*, 11, 430-433.
- Newman, C., Weinstein, B., Jacobson, G., & Hug, G. (1991). Test-retest reliability of the Hearing Handicap Inventory for Adults. *Ear and Hearing*, 12, 355-357.
- Primeau, R. (1997). Hearing aid benefit in adults and older adults. *Seminars in Hearing*, 18(1), 29-35.
- Stephens, D., Jones, G., & Gianopoulos, I. (2000). The use of outcome measures to formulate intervention strategies. *Ear and Hearing*, 21, 15S-23S.
- Ventry, I.M., & Weinstein, B. (1982). The Hearing Handicap Inventory for the Elderly: A new tool. *Ear and Hearing*, 3, 128-134.