Should Significant Others Be Encouraged to Join Adult Group Audiologic Rehabilitation Classes?

Jill E. Preminger*

Abstract
The benefit of participation in group audiologic rehabilitation classes was examined for adults with hearing loss (subjects) and their significant others (SOs). Thirteen subjects attended the classes with their SOs, and 12 subjects attended the classes on their own. All subjects attended six 90-minute classes consisting of informational lectures, and training in communication strategies, auditory perception, and auditory and visual perception. Self-assessment scales measuring hearing aid benefit and use of communication strategies were completed prior to class participation and following the completion of all classes. The results indicated that the majority of subjects reported increased use of communication strategies following class participation. In addition, a significant reduction in hearing handicap following class participation was measured across all subjects and SOs, and the greatest reduction in handicap was measured for subjects who attended the classes with their SOs. SO participation in group AR (audiologic rehabilitation) classes should be encouraged.

Key Words: Audiologic rehabilitation, communication strategies, hearing handicap, rehabilitation of hearing impaired

Abbreviations: AR = audiologic rehabilitation; CSOA = Communication Scale for Older Adults; HHIE/A = Hearing Handicap Inventory for the Elderly/Adults; SO = significant other

Sumario
Se examinó el beneficio de la participación de adultos con hipoacusia (sujeto) y de la “persona significativa” para ellos (Significant other: SO), en sesiones de rehabilitación audiológica grupal. Trece sujetos asistieron a dichas sesiones con sus “SO” y doce lo hicieron solos. Todos los sujetos asistieron a seis sesiones de 90 minutos que incluían conferencias de información, y un entrenamiento en estrategias de comunicación, en percepción auditiva y en percepción auditiva y visual. Se completaron escalas de auto-evaluación que median el beneficio de los auxiliares auditivos y el uso de estrategias de comunicación, antes de participar en estas sesiones y después de completar todo el proceso. Los resultados indican que la mayoría de los sujetos reportaron un incremento en el uso de las estrategias de comunicación a partir de su participación en estas sesiones. Además, se detectó una reducción significativa en la desventaja auditiva luego de dicha participación, en todos los sujetos y sus “SO”, y la mayor reducción en la desventaja se obtuvo en aquellos sujetos que asistieron acompañados de su “persona significativa”. La participación de las “personas significativas” para el paciente, en las sesiones de RA grupal (rehabilitación auditológica) debería ser estimulada.

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Group classes are an important way for audiologists to provide audiologic rehabilitation (AR) to their patients with hearing loss. Group classes typically include information about hearing loss, speechreading training, and communication strategies training. Adults with hearing loss who participated in group AR classes that met for as little as three hours (Abrams et al., 1992) and for as many as 40 hours (Kaplan et al., 1997) have demonstrated a significant reduction in hearing handicap.

It is well known that support by significant others during the rehabilitation phase of patient management is important (Hétu et al., 1993; McLean, 1995; Stewart et al., 2001). Spousal support following heart attack has been shown to help individuals cope with their physical restrictions, adhere to risk reduction behaviors, and lower stress (Stewart et al., 2001). When good social support is available, patients with illness live longer (McLean, 1995). Therefore, it is likely that including a significant other, such as a spouse, in the AR process will aid in the reduction of hearing handicap.

AR programs for SOs (significant others) have been described in the literature (Getty and Hétu, 1991; Hallberg and Barrenas, 1994; Tye-Murray and Schum, 1994), although there is limited information about the success of these programs. Getty and Hétu (1991) evaluated the success of group AR classes for 48 men with noise-induced hearing loss and their spouses. Classes met for four two-hour sessions or for eight hours during a weekend. One-half of the class time was devoted to informational lectures and training in communication strategies, speechreading, and relaxation exercises. The other half of the class time was devoted to group discussion for the purpose of psychosocial support. Twenty-four of the subjects completed a pre- and postclass handicap questionnaire. Mixed results were reported on the handicap questionnaire; a decrease in handicap was measured by some questions, and an increase was measured for other questions as a result of class participation. Spouses did not complete the written questionnaire, but both subjects and spouses participated in group interviews following the completion of the class.

Hallberg and Barrenas (1994) also evaluated the impact of adult group AR classes for men with noise-induced hearing loss and their significant others. The group class was very similar in design to the class described by Getty and Hétu (1991). Twelve subjects with hearing loss participated in the class; an additional 24 men with hearing loss did not complete the class and served as control subjects. The results for preclass and postclass hearing handicap scales revealed that the men who took the class had a greater decrease in hearing handicap compared to those men who did not take the class. Spouses did not complete the written questionnaires.

Based on the existing data, it is still not clear whether SOs should be encouraged to join in the group AR process. No previous investigation has compared the benefit of group AR classes for adults with hearing loss who attended class with their SOs compared to those who attended class without their SOs. In addition, no previous investigation has evaluated the benefit of group AR classes for individuals with hearing loss and their SOs, when questioned separately.

The purpose of the present investigation was:

1. to determine whether involvement of significant others in group AR classes could reduce hearing handicap further than that provided by the class alone;
2. to analyze changes in hearing handicap following group AR classes separately for individuals with
hearing loss and for their SOs; and
3. to analyze the results of this data
set in order to determine whether
individual subject characteristics
(e.g., degree of hearing loss) could
be used in order to preselect which
individuals could benefit from
participation in group AR classes.

METHODS

Subjects

Twenty-five adults with hearing loss and
their significant others served as subjects. All
patients who had purchased hearing aids
from the private practice associated with the
University of Louisville Program in Audiology
were invited to participate. Subjects were
assigned to one of the two treatment groups:
(1) the “With SO” group in which subjects
attended all group AR classes with their
significant other and (2) the “Without” group
in which subjects attended all group AR classes
without their significant other, but their SO
did complete the pre- and postclass tests.

Ten of the subjects were randomly
assigned to one of the two groups; the
remaining subjects were assigned to the two
groups based on preference and convenience.
While random assignment for all would have
been preferable for statistical purposes, the
practical constraints of preference and
convenience could not be ignored. For example,
some SOs could not attend the classes due to
conflicts with their work schedules. In a typical
clinical practice, these constraints will
determine participation in group AR classes.
The present investigation was designed to
determine the benefit of the AR classes for
patients seen in a typical clinical setting.

Identifying subject information is shown
in Table 1. Thirteen subjects attended the
classes with their SOs, and 12 subjects
attended the classes on their own. While the
subjects were a diverse group in terms of
age, hearing loss, and the number of years
aided, these characteristics varied in a similar
fashion across the two subject groups. The
mean ages, binaural PTAs, and years aided
are shown in Table 1; these are quite similar
across the two treatment groups.

According to previous research, an
individual has experienced a significant
difference in hearing handicap if their total
score has changed by more than 18.7 points
on the Hearing Handicap for the Elderly
(HHIE) (when the test is administered with
the examiner present) (Weinstein et al, 1986)
and by 11.9 points on the Hearing Handicap
Therefore, a subject would have to have an
initial HHIE score of at least 20 points in
order to demonstrate benefit from AR class
attendance. In the present study, each subject
was required to have a preclass HHIE/A score
of at least 30 in order to participate. In this
way, each subject had a reasonable
opportunity to demonstrate benefit from class
participation. The initial HHIE/A scores are
shown in Table 1.

The two subject groups differed in terms
of gender and in terms of SO participation.
The subjects in the With SO group were nine
males and four females, and 11 of the SOs
were spouses. The subjects in the Without
group were four males and eight females,
and eight of the SOs were spouses (see Table
1). The With SO group had a higher
percentage of male subjects and a higher
percentage of spouses as SOs. This is due to
the demographics of the elderly population.
Many of the female subjects who participated
were widows whose adult daughters
participated. Most of these daughters were
working and were unable to attend the
classes. Some of the female subjects were
married, but their husbands were working
and unable to participate, or their husbands
were not healthy enough to attend the weekly
meetings. Many of the male subjects who
participated were married, and their wives
were their constant companions. These factors
all may have affected the outcome of this
study and are discussed in the results and
discussion sections.

Classes

Each AR course was a set of six 90-minute
classes that met once a week for six weeks.
The 25 subjects with hearing loss and their
13 SOs who attended the classes each
completed the entire six-class course. Eight
separate six-class courses were held; each
course was attended by a small group of four
through eight students. This allowed students
to form relationships in the small class
atmosphere over the six-week period.

One half hour of each class was devoted
to an informational lecture. The topics
discussed were (1) A Model of Communication, (2) Repair and Facilitative Strategies, (3) Hearing Anatomy and the Audiogram, (4) Hearing Aids, (5) Assistive Devices, and (6) Speaking Clearly for the Hearing Impaired. The remainder of the class time was devoted to training in three areas: (1) Communication Strategies, (2) Auditory Perception, and (3) Auditory and Visual Perception. The training was adapted from Wayner and Abrahamson's Learning to Hear Again program (1996), Jeffers and Barley's Speechreading text (1971), Tye-Murray's Communication Training for Older Teenagers and Adults (1997), and Kaplan et al's Speechreading: A Way to Improve Understanding (1985). All subjects, along with the participating SOs (in the With SO group), completed all aspects of the training.

The auditory and auditory visual training was conducted using both analytic and synthetic materials. All training was conducted live voice in the presence of a speech-shaped noise masker. Subjects had to write their answers on answer sheets. Their performance was monitored, and class seating was rearranged as needed to ensure that performance was at 70 percent correct on average for the auditory-visual analytic materials. Subjects who were performing

<table>
<thead>
<tr>
<th>Group</th>
<th>Age (years)</th>
<th>Sex</th>
<th>Binaural PTA (dB HL)</th>
<th>Years aided</th>
<th>Initial HHIE/A</th>
<th>Significant Other</th>
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</thead>
<tbody>
<tr>
<td>With SO</td>
<td>66</td>
<td>M</td>
<td>43</td>
<td>3</td>
<td>68</td>
<td>Wife</td>
</tr>
<tr>
<td>With SO</td>
<td>71</td>
<td>M</td>
<td>63.5</td>
<td>10</td>
<td>72</td>
<td>Wife</td>
</tr>
<tr>
<td>With SO</td>
<td>61</td>
<td>M</td>
<td>52</td>
<td>13</td>
<td>48</td>
<td>Wife</td>
</tr>
<tr>
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<td>77</td>
<td>M</td>
<td>58.5</td>
<td>10</td>
<td>60</td>
<td>Wife</td>
</tr>
<tr>
<td>With SO</td>
<td>51</td>
<td>F</td>
<td>95</td>
<td>10</td>
<td>64</td>
<td>Close Friend</td>
</tr>
<tr>
<td>With SO</td>
<td>62</td>
<td>M</td>
<td>37.5</td>
<td>2</td>
<td>40</td>
<td>Wife</td>
</tr>
<tr>
<td>With SO</td>
<td>78</td>
<td>F</td>
<td>68.5</td>
<td>10</td>
<td>82</td>
<td>Husband</td>
</tr>
<tr>
<td>With SO</td>
<td>79</td>
<td>F</td>
<td>48.5</td>
<td>11</td>
<td>64</td>
<td>Husband</td>
</tr>
<tr>
<td>With SO</td>
<td>79</td>
<td>F</td>
<td>60</td>
<td>9</td>
<td>64</td>
<td>Companion</td>
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<tr>
<td>With SO</td>
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<td>M</td>
<td>40</td>
<td>15</td>
<td>38</td>
<td>Wife</td>
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<tr>
<td>With SO</td>
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<td>M</td>
<td>61.5</td>
<td>35</td>
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<tr>
<td>With SO</td>
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<td>52</td>
<td>0.5</td>
<td>42</td>
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</tr>
<tr>
<td>With SO</td>
<td>84</td>
<td>M</td>
<td>54</td>
<td>2</td>
<td>36</td>
<td>Wife</td>
</tr>
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**Mean (SD)**

<table>
<thead>
<tr>
<th>Group</th>
<th>Age (years)</th>
<th>Sex</th>
<th>Binaural PTA (dB HL)</th>
<th>Years aided</th>
<th>Initial HHIE/A</th>
<th>Significant Other</th>
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<tbody>
<tr>
<td>Without</td>
<td>71.3(9.4)</td>
<td>56.5(14.8)</td>
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<tr>
<td>Without</td>
<td>73</td>
<td>F</td>
<td>37</td>
<td>2</td>
<td>50</td>
<td>Daughter</td>
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<tr>
<td>Without</td>
<td>57</td>
<td>M</td>
<td>57</td>
<td>6</td>
<td>30</td>
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</tr>
<tr>
<td>Without</td>
<td>78</td>
<td>F</td>
<td>52.5</td>
<td>21</td>
<td>38</td>
<td>Daughter</td>
</tr>
<tr>
<td>Without</td>
<td>51</td>
<td>F</td>
<td>90</td>
<td>25</td>
<td>72</td>
<td>Husband</td>
</tr>
<tr>
<td>Without</td>
<td>63</td>
<td>F</td>
<td>62</td>
<td>4</td>
<td>34</td>
<td>Husband</td>
</tr>
<tr>
<td>Without</td>
<td>72</td>
<td>F</td>
<td>48.5</td>
<td>15</td>
<td>36</td>
<td>Husband</td>
</tr>
<tr>
<td>Without</td>
<td>80</td>
<td>F</td>
<td>56.5</td>
<td>3</td>
<td>62</td>
<td>Husband</td>
</tr>
<tr>
<td>Without</td>
<td>73</td>
<td>M</td>
<td>73</td>
<td>25</td>
<td>70</td>
<td>Wife</td>
</tr>
<tr>
<td>Without</td>
<td>69</td>
<td>M</td>
<td>34.5</td>
<td>0.5</td>
<td>46</td>
<td>Wife</td>
</tr>
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<td>Without</td>
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<td>F</td>
<td>70.5</td>
<td>20</td>
<td>58</td>
<td>Husband</td>
</tr>
<tr>
<td>Without</td>
<td>79</td>
<td>M</td>
<td>53</td>
<td>2</td>
<td>32</td>
<td>Daughter</td>
</tr>
<tr>
<td>Without</td>
<td>84</td>
<td>F</td>
<td>57</td>
<td>8</td>
<td>34</td>
<td>Companion</td>
</tr>
</tbody>
</table>

**Mean (SD)**

<table>
<thead>
<tr>
<th>Group</th>
<th>Age (years)</th>
<th>Sex</th>
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<th>Years aided</th>
<th>Initial HHIE/A</th>
<th>Significant Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>71.3(9.5)</td>
<td>57.6(15.3)</td>
<td>10(9.6)</td>
<td>46.00(16.27)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
poorly were moved closer to the instructor, and subjects who were performing well were moved farther away.

During the informational lecture, and between the training exercises, class discussion was encouraged. For example, class members shared successful and unsuccessful communication strategies after communication strategy training, and they discussed assistive devices that did or did not work for them following the assistive device lecture. These discussions provided an opportunity for psychosocial support for all class participants (attendees with hearing loss and their SOs).

All classes were taught by licensed audiologists or by students in the University of Louisville audiology doctoral program under the supervision of an audiologist. The same instructor was present for the entire six-week class program. Each instructor followed a detailed class curriculum in order to ensure consistency across instructors.

**Evaluation Measures**

Subjects and their SOs completed self-assessment scales prior to the beginning of the six-week course and at the completion of the course. The questionnaires were completed in the presence of an audiologist who was available to answer any questions. The questionnaires completed by the SOs who did not participate were completed at home.

Subjects and their SOs were evaluated with the Hearing Handicap Inventory for the Elderly/Adult (HHIE/A), Ventry and Weinstein (1982), Newman et al (1991). This 25-item scale has two subscales, Social Function and Emotional Function (as it relates to hearing loss), and is a measure of hearing handicap. A form of this test is available for significant others (Newman and Weinstein, 1988). For all scales, subjects respond to questions about their hearing problems with a yes (4 points), sometimes (2 points), or no (0 points). The responses are summed; total scores can range from 0 to 100, and a higher score indicates greater perceived handicap. In the present study, the total score on the HHIE/A was used as a global measure of hearing handicap.

Subjects were also evaluated with the Communication Scale for Older Adults (CSOA) (Kaplan et al, 1997). This 72-item scale has two subscales: Communication Strategies and Communication Attitudes. It directly assesses an individual's use of communication strategies and his or her attitudes toward hearing loss and perceived attitudes of others toward hearing loss. On this evaluation measure subjects respond to statements about their communication strategy use and their hearing problems using a 5-point scale with “always” being 1 point and “never” being 5 points. The responses are averaged; total scores can range from 0 through 5 points, and a higher score indicates a higher degree of communication difficulty.

**RESULTS**

**Preclass Results**

In order to compare the results between the groups, it is important to first examine whether pretest differences existed. Table 2 shows the preclass HHIE/A scores for the subjects and their SOs. A two-way analysis of variance (ANOVA) was performed for the factors “subject type” (subject vs. SO) and “group type” (With SO vs. Without). The results revealed a significant main effect for subject type (F[1,46] = 4.92; p = .032); the subjects had significantly greater initial hearing handicap than the handicap that was perceived by the SOs. There was no significant main effect for “group type” or for the “group type” x “subject type” interaction. This shows that there were no pretest differences in hearing handicap for the subjects with hearing loss in the With SO group.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Means (Standard Deviations) of Pretest Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With SO Group Subjects</td>
</tr>
<tr>
<td>HHIE</td>
<td>56.15 (14.55)</td>
</tr>
<tr>
<td>CSOA—strategies</td>
<td>3.10 (0.38)</td>
</tr>
<tr>
<td>CSOA—attitudes</td>
<td>2.38 (0.34)</td>
</tr>
</tbody>
</table>
group vs. the Without group.

Table 2 also shows the preclass CSOA data for both groups of subjects. A two-way ANOVA was performed for the factors “group type” (With SO vs. Without) and CSOA subscale (strategies vs. attitudes). No significant main effects or interactions were measured; there were no significant preclass differences between the two subject groups on either CSOA subscale.

Subject Benefit from AR Class Participation—HHIE

Results are described for subjects only first; the results for the subjects along with their SOs are described in a later section. In order to determine whether the subjects received benefit from the group AR class, the average change in HHIE/A scores was compared across treatment groups. A two-way ANOVA was performed for the factors “time of test” (pretest vs. posttest) and “group type” (With SO vs. Without). There was a significant main effect for time of test ($F[1,46]=13.52; p=.001$), but there was no main effect for group type or significant interaction. This indicates that, overall, all subjects received a significant reduction in hearing handicap as a result of class participation. There were no differences between subject groups in terms of preclass scores or postclass scores.

The benefit of class participation was measured by subtracting postclass HHIE/A scores from preclass scores; these results are shown in Figure 1. A t-test analysis revealed a significant difference in total benefit (t-test, $p = .04$) between the two subject groups. The subjects in the With group had significantly more benefit than the subjects in the Without group. This difference in benefit across subject groups was significant for the social subscale (t-test, $p = .027$) but not for the emotional subscale (t-test, $p = .12$).

Another way to compare the data across groups is to examine the individual benefit scores. The individual difference scores for the subjects are shown in Figure 2. The subjects are combined into difference-score bins that are 5 points wide. The top graph shows the data for the 19 subjects who were 65 and over who completed the HHIE. All bars to the right of the dashed vertical line represent

![Figure 1](image1.png) **Figure 1** Mean HHIE/A benefit scores for the total scale and for the emotional and social subscales. Mean scores for subjects in the With SO group are shown with the filled bars and with the open bars for the subjects in the Without group. Significant differences in benefit between the two groups are shown with an asterisk.

![Figure 2](image2.png) **Figure 2** Individual difference scores on the total HHIE/A. The numbers of subjects in each 5-point bin are shown with the filled bars for the With SO group and with the open bars for the Without group. The mean difference score for each bin is shown on the x axis. Bars to the right of the dashed line represent a significant reduction in handicap. Results for the HHIE are shown in the top graph and for the HHIA in the bottom graph.
changes in scores greater than the critical difference score for the HHIE of 18.7 points (Weinstein et al., 1986). The bottom graph shows data for the six subjects who were under 65 who completed the HHIA. All bars to the right of the dashed vertical line represent changes in scores greater than the critical difference score for the HHIA of 11.9 points (Newman et al., 1991). Eight subjects in the With SO group showed a significant decrease in their hearing handicap score while only one subject in the Without group showed a significant decrease.

In summary, as a result of the AR classes, the group data revealed a significant reduction in hearing handicap across all subjects. Further analysis revealed that, on average, subjects in the With SO group had a greater reduction in handicap than the subjects in the Without group. On an individual basis, there were more individuals in the With SO group than in the Without group who demonstrated a significant decrease in hearing handicap as a result of the class.

Subject Benefit from AR Class Participation—CSOA

The CSOA test was used because it directly assesses individuals’ use of communication strategies (strategies subscale), and communication strategies training was a major component of the group AR class. An ANOVA analysis was performed for the factors “test time” (preclass vs. postclass), “subject group” (With SO vs. Without), and “scale” (strategies vs. attitudes). The results revealed a significant main effect for “time of test” (F[1,92] = 7.02, p = .009); across all subjects there was a significant improvement on the CSOA test following the group AR classes. No other significant differences were measured.

The CSOA results were also analyzed in terms of benefit; preclass scores minus postclass scores. The mean benefit for each of the subscales is shown in Figure 3. A two-way ANOVA was completed in order to compare benefit across subject groups and subscales. The results for the factor: scale, approached significance (F[1,46] = 3.90; p = .054). Across all subjects there was more benefit for the strategies subscale compared to the attitude subscale, but this difference was not significant. There was no main effect for subject group; the benefit from the AR

![Figure 3](image)

**Figure 3** Mean CSOA scores for the Strategies and Attitudes subscales. Mean scores for subjects in the With SO group are shown with the filled bars and with the open bars for the subjects in the Without group.

![Figure 4](image)

**Figure 4** Individual difference scores for the CSOA subscales. The numbers of subjects in each .2-point bin are shown with the filled bars for the With SO group and with the open bars for the Without group. The mean difference score for each bin is shown on the x axis. Bars to the right of the dashed line represent a significant reduction in handicap. Results for the Strategies subscale are shown in the top graph and for the Attitudes subscale in the bottom graph.
classes was similar for subjects in the With SO group and the Without group.

The individual improvement on the CSOA is shown in Figure 4. The subjects are combined into difference-score bins that are .2 points wide. A difference of 0.1 or greater is considered a significant difference (Kaplan et al, 1997). All bars to the right of the dashed vertical line show difference scores that are greater than 0.1 and, therefore, are significant. The results for the strategies subscale are shown in the top graph. For the subjects in the With SO group, 11 out of 13 showed a significant improvement in their use of communication strategies; for the Without group, 8 out of 12 subjects showed a significant improvement. The individual improvement on the attitudes subscale is shown in the bottom part of Figure 4. For the subjects in the With SO group, 7 out of 13 showed a significant improvement for the attitude scale; for the Without group, 6 out of 12 showed a significant improvement. The individual improvement for each CSOA subscale is quite similar across the two subject groups.

**Subject Benefit from AR Class Participation: Gender**

Because there was an imbalance in the number of male and female subjects in each of the treatment groups, it is important to determine whether the significant difference found for the HHIE/A benefit was due to gender rather than the treatment. Across both treatment groups, the mean benefit for the males on the total HHIE/A score was 15.7 points while the mean benefit for the females was 15.8. There was no significant difference between these means (t-test, p = 0.9).

**SO vs. Subject Benefit**

The following section describes the results for both the subjects and their SOs. Both subjects and SOs were evaluated with the HHIE/A. This allows for a comparison between the subject’s perception of his or her own hearing handicap and the SO’s perception of the handicap experienced by his or her partner (or parent or friend) with hearing loss. As shown in Table 2 and discussed in the preclass results section of this report, there was a significant difference in preclass HHIE scores between subjects and SOs. Subjects perceived their handicap to be greater than the handicap perceived by their SOs prior to the initiation of this study. This finding is discussed in detail in a separate report (Preminger, in press).

The average change in HHIE/A scores was compared across treatment groups. A three-way ANOVA was performed for the factors “time of test” (preclass vs. postclass), “subject type” (subject vs. SO), and “group type” (With SO vs. Without). There was a significant main effect for “time of test” ($F[1,92] = 10.61; p = .002$). Across all subjects and SOs, there was a significant effect of treatment; hearing handicap was significantly reduced following the group AR classes.

Mean benefit (postclass scores minus preclass scores) for the HHIE/A are shown in Figure 5. The benefit scores were examined with a two-way ANOVA. The main effects were subject type (subject vs. SO) and group type (With SO vs. Without). The interaction between subject type and group approached significance ($F[1,26] = 3.255, p = .078$). When using a .10 significance level, the benefit for the subjects in the With SO group was significantly higher than the benefit for all other groups: the subjects in the Without group and all SOs.

**Correlations with Benefit**

Because the subjects who participated in this project had such a wide range of ages, PTAs, and years of hearing aid use, it is useful to examine these data to determine whether any of these factors were correlated with benefit from the AR classes. If
correlations exist, this information could be used in order to determine which individuals would benefit most from participation in group AR classes. This would be useful in recruiting individuals to future AR classes.

Correlations between subject characteristics and measures of benefit were calculated. The subject characteristics were: age, binaural pure-tone average, and years of hearing aid use. The measures of benefit were benefit scores for the total HHIE/A, CSOA strategies scale, and CSOA attitudes scale. The correlations were made separately for subjects in the With SO group, the Without group, and then across all subjects. These correlations are shown in Table 3. Only one correlation was significant: the correlation between years of hearing aid use and the strategies subscale for the CSOA, for the With SO group subjects. For this same group of subjects, the correlation between age and the strategies subscale approached significance (p = .054). This indicates that for subjects who participated in the classes with their SOs, there appeared to be an increase in use of communication strategies for newer hearing aid users and younger subjects.

**DISCUSSION**

**Benefit for Subjects with Hearing Loss**

The group AR classes focused on training: training in speechreading, training in auditory perception, and training in communication strategies. Approximately 45 minutes of each 90-minute session involved class exercises in these areas. The results for the CSOA scale indicate that the listeners with hearing loss who participated in the classes learned new communication strategies and were more willing to use these strategies as a result of the class participation. The majority of the subjects (76 percent) showed an improvement on the CSOA strategies subscale as a result of the class. This is encouraging; when adults with hearing loss were trained regarding the specific strategies, they reported using these strategies more often than they did prior to training.

It is likely that the subjects who participated in these classes will continue to use these strategies for an extended period of time. Kaplan et al (1997) found that 20 of 39 subjects showed benefit on the CSOA strategies scale after a group AR program. Of these 20 subjects, 13 (65 percent) continued to show this improvement nine months after the class was completed.

While most of the subjects in the present study did show improved communication strategies, fewer subjects showed improved feelings and attitudes about hearing loss as a result of the training. For all 25 listeners with hearing loss who participated, 52 percent showed benefit on the CSOA attitudes scale, and 36 percent showed benefit on the HHIE/A, as a result of the group AR classes. Improved use of communication strategies does not necessarily result in a reduction in

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Correlations between Benefit Scores for Subjects on the HHIE and the CSOA and Identifying Subject Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With SO Group</td>
</tr>
<tr>
<td>Age (years)</td>
<td>.23</td>
</tr>
<tr>
<td>Binaural PTA</td>
<td>.09</td>
</tr>
<tr>
<td>Years HA use</td>
<td>.38</td>
</tr>
<tr>
<td>Without Group</td>
<td>HHIE</td>
</tr>
<tr>
<td>Age (years)</td>
<td>.20</td>
</tr>
<tr>
<td>Binaural PTA</td>
<td>-.05</td>
</tr>
<tr>
<td>Years HA use</td>
<td>-.01</td>
</tr>
<tr>
<td>All Subjects</td>
<td>HHIE</td>
</tr>
<tr>
<td>Age (years)</td>
<td>.20</td>
</tr>
<tr>
<td>Binaural PTA</td>
<td>.01</td>
</tr>
<tr>
<td>Years HA use</td>
<td>.17</td>
</tr>
</tbody>
</table>

*Note: The correlation that is significant at the .05 level is shown with an asterisk.*
There was a tendency for adults with hearing loss to show improved attitudes and feelings as a result of the group AR class if their SOs participated. For the With SO group, 54 percent showed benefit on the CSOA attitude scale, and 62 percent showed benefit on the HHIE/A as a result of the group AR classes. For the Without group, 50 percent showed benefit on the CSOA attitude scale, and only 8 percent (one out of 12) showed benefit on the HHIE/A as a result of the group AR classes. When an SO participates in the group AR class, it may result in increased benefit for the subject with hearing loss.

**Benefit as Perceived by SOs**

According to benefit scores for the HHIE/A, the SOs did not perceive as much benefit from the AR classes as the subjects. There are several possible explanations for this discrepancy. First, the SOs had lower preclass HHIE/A scores than the subjects with hearing loss (see Table 2). With a lower initial handicap, there is less possibility of showing benefit as a result of the classes. Using the 95 percent critical difference, individuals had to show benefit of at least 18.7 points on the HHIE (Weinstein et al., 1986). All 25 subjects with hearing loss had pretest scores greater than 18.7; therefore, they all had the potential to demonstrate a significant reduction in hearing handicap. Of the 25 SOs, 18 had pretest scores greater than 18.7. This means that only 72 percent of the SOs had the potential to demonstrate a significant reduction in hearing handicap.

A second factor to consider is that participation in the group AR classes gave the SOs an opportunity to understand their loved one’s communication problems better. Prior to the class, SOs may not have truly understood the hearing handicap experienced by their loved one with hearing loss. Participation in the class may have given the SOs an opportunity to better understand the communication problems that result from hearing loss. If this were the case, then the HHIE/A scores for the SOs should actually increase as a result of the class rather than decrease. HHIE/A scores did increase for six of the 13 SOs who participated in the class and for two of the 12 SOs who did not participate.

A third way to consider this discrepancy is by comparing the benefit received for each SO and his or her corresponding loved one with hearing loss. Figure 6 shows HHIE/A benefit for SOs as a function of HHIE/A benefit for subjects. The top graph shows results for the With SO group, and the results for the Without group are shown in the bottom graph. The results for the Without group show a correlation that approaches significance. As the subject’s benefit increased, their SO’s perception of benefit also increased. These SOs did not participate in the class. It is possible that they noticed an improved attitude by their loved one with hearing loss at home, and this is reflected in the HHIE/A score of the SO. For the With SO group, there was no correlation between perceived handicap for the subject and the SO. Perceived benefit remained flat and below 20 points for the majority of SOs despite the benefit received by the subjects. As discussed in the previous paragraph, this may be due to increased understanding of hearing handicap as a result of class participation.

Finally, when considering the discrepancy in benefit between subjects and SOs, it is important to remember that the HHIE/A for the SO does not measure the communication handicap experienced by the SO as a result of hearing loss.
of their relationship with a person with hearing loss. The HHIE/A for the SO measures what the SO perceives as the communication handicap experienced by the individual with hearing loss. This is another reason why HHIE/A scores may not have improved as much for SOs. If the SOs own communication handicap was being measured, the results may have been different. This would be interesting to explore in future research.

**Predicting Benefit from AR Classes**

The correlations shown in Table 3 were mostly small and nonsignificant. This demonstrated that reduction in hearing handicap as a result of class participation is generally not correlated with the subject's degree of hearing loss, the subject's age, or even the number of years that the subject has used hearing aids. The greatest reduction in hearing handicap, a 40-point benefit on the HHIE/A was measured for a 78-year-old man who had been using hearing aids for 38 years. Two individuals showed a 38-point benefit on the HHIE/A, a 66-year-old man who had worn hearing aids for three years and a 78-year-old female who had worn hearing aids for ten years. While group AR classes are often offered to new hearing aid users, experienced hearing aid users can also benefit from participation.

The results did suggest that newer hearing aid users and younger individuals may receive increased benefits from communication strategies training. It would be interesting to see if these correlations hold when larger numbers of subjects are evaluated.

**CONCLUSIONS**

The majority of subjects received benefit from participation in the group AR classes. Benefit was measured by a significant reduction in scores for the HHIE/A and/or for the CSOA. There was a tendency for increased benefit for subjects who participated along with their SOs. Having SO participation did not appear to decrease benefit in any way. Therefore, SO participation in group AR classes should be encouraged.

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