

Acknowledgement of Hearing Loss by Older Adults

Sherri L. Smith

*Veterans Affairs Medical Center
East Tennessee State University*

Patricia B. Kricos

University of Florida, Gainesville

The purpose of this study was to determine the extent to which older adults acknowledge hearing loss and to evaluate whether perceived hearing loss is associated with age, gender, or health factors. Ninety-one older adults with no hearing aid experience answered a perceived hearing loss question (“Do you think you have a hearing loss?”), completed the Hearing Handicap Inventory for the Elderly (screening), and rated their overall health. Hearing screenings were conducted. Findings showed that most of the older adults acknowledged hearing loss (indicated via a hearing screening) and/or hearing problems, despite their lack of hearing aid use.

Audiologists frequently lament that many older adults deny their hearing losses and hearing problems (Hétu, 1996; National Council on the Aging, 1999). A reason frequently postulated for lack of hearing aid use in older adults is denial of hearing loss (Maurer, 1998; Rawool, 2000). Hearing impairment is a common chronic condition affecting older adults, yet only approximately 20% of those who could benefit from hearing aids own them (Jerger, Chmiel, Wilson, & Luchi, 1995). Acknowledgement of hearing loss may be a strong predictor of whether an older individual pursues hearing healthcare and complies with treatment

Sherri L. Smith, Department of Communicative Disorders, East Tennessee State University and Veterans Affairs Medical Center; Patricia B. Kricos, Department of Communication Sciences and Disorders, Center for Gerontological Studies, University of Florida, Gainesville.

Correspondence concerning this article should be addressed to Sherri L. Smith, AuD, PhD, James H. Quillen Veterans Affairs Medical Center, Audiology – 126, Mountain Home, Tennessee, 37684. E-mail: sherri.smith@med.va.gov

protocols.

Hétu, Jones, and Getty (1993) suggested that lack of hearing loss acknowledgement might be observed in different ways. One way might be complete denial. Another form of non-acknowledgment may be observed when individuals with hearing loss minimize the communicative and psychosocial impact of the hearing loss. Some individuals may not be comfortable sharing problems with other individuals, and therefore are reluctant to acknowledge hearing loss. And finally, Hétu et al. suggested that reluctance to acknowledge hearing loss might be a way of normalizing the hearing loss (i.e., hearing loss is a normal part of aging).

Factors that may influence hearing loss acknowledgment have been suggested in recent literature. These factors include stigma associated with hearing loss (Erler & Garstecki, 2002; Hétu, 1996; Hétu et al., 1993), coping skills (Garstecki & Erler, 1999; Wiley, Cruickshanks, Nondahl, & Tweed, 2000), gender (Garstecki & Erler, 1999; Hétu et al., 1993), chronological age (Erdman & Demorest, 1998; Erler & Garstecki, 2002), successful aging (Hétu et al., 1993; Pichora-Fuller & Robertson, 1994; van den Brink, Wit, Kempen, & van Heuvelen, 1996) and other priorities such as chronic health conditions (Maurer, 1998).

Individuals with hearing loss who are not willing to acknowledge the loss are at risk to develop psychosocial problems as a result. According to Erler and Garstecki (2002), lack of hearing loss acknowledgement gravely impedes the adjustment and rehabilitative process (i.e., seeking professional help and/or adhering to treatment recommendations). It is vital, therefore, to understand acknowledgement and the factors that relate to hearing loss acknowledgement, so that interventions can be developed to help individuals accept their hearing difficulties and avail themselves of rehabilitative options.

The purpose of this study was to examine the extent to which older adults acknowledge their own hearing losses. An additional objective was to determine whether factors such as age, gender, self-perceived hearing handicap, and health are associated with the acknowledgement of hearing loss. Specifically, the following questions were addressed:

1. Do older adults acknowledge hearing loss via self-report?
2. Do older males and older females differ in hearing loss acknowledgement?
3. Do older adults who acknowledge hearing loss also report hearing handicap?
4. Within a group of older adults, is acknowledgement of hearing loss associated with age?
5. Is acknowledgement of hearing loss affected by health status?
6. Which factors predict hearing loss acknowledgement by older adults?

METHOD

Participants

Participants were recruited from retirement community advertisements made through community list-serves, health fairs, and aging organization networking meetings. In all advertising media, it was clearly stated that the researchers conducting this project were interested in completing “a hearing study with older individuals who thought they had hearing loss *and* with older adults who thought they had normal hearing.” These advertisements were worded in this fashion to attempt to recruit individuals with a wide variety of opinions about their hearing status as opposed to recruiting only those who thought they had hearing loss.

To be included in the study, individuals had to be 65 years of age or older, have the ability to read and understand American English, and have no prior hearing aid experience. Individuals with a history of hearing aid use were excluded from participation in the study because, presumably, hearing aid users already would know their diagnosed hearing status.

Ninety-one community-dwelling individuals, 64 females and 27 males, completed the study. The mean age of participants was 75.5 ($SD = 6.9$) years, with the mean age of male participants being 75.2 years ($SD = 6.0$) and the mean age of female participants being 75.6 years ($SD = 7.3$).

Procedure

The study, which was approved by the University of Florida Institutional Review Board, had two parts that were counter-balanced across participants. One part focused on self-report of hearing loss, overall health, and hearing handicap and a second part included screening the participant’s hearing. All instructions and questions were orally presented to the participants. For the self-report part of the study, participants responded to the perceived hearing loss question, “Do you think you have a hearing loss?” The participants answered “yes” or “no.” This question was asked to assess hearing loss acknowledgement. Second, participants responded to the question, “If you were to rate your overall health, would you say excellent, good, fair, poor, or very poor?” Only one response was accepted: (a) excellent, (b) good, (c) fair, (d) poor, or (e) very poor.

The Hearing Handicap Inventory Elderly-Screening version (HHIE-S; Ventry & Weinstein, 1983), which has strong psychometric properties (Wiley et al., 2000), was then administered orally and scored immediately. This questionnaire consists of 10 questions about a “hearing problem.” Individuals responded “yes,” “sometimes,” or “no” to the questions that were scored 4, 2, or 0, respectively. The 10 questions are divided into two subscales of items related to emotional or social consequences of hearing loss. The two subscale scores are added to make a total score, ranging from 0 to 40. Lower total scores suggest a lesser extent of self-perceived hearing handicap.

Finally, a checklist of the top 10 chronic conditions affecting older adults in the United States in 1994 (National Center for Health Statistics, 1995) was completed for each participant. The 10 chronic health conditions on the checklist are as follows: arthritis, hypertension, hearing impairment, heart disease, sinusitis, orthopedic impairment, cataracts, diabetes, visual impairments, and tinnitus. Each condition was read out loud. If a participant was uncertain about a condition, it was described in layman's terms. The participants answered "yes" or "no" depending on whether or not they felt they had the condition.

For the pure-tone screening, the following procedures were conducted using an AudioScope3™ (Welch Allyn, Inc., Skaneateles Falls, NY), which is an otoscope with a built-in pure-tone screening audiometer. The examiner selected an appropriate size speculum that left no gaps between the external auditory meatus and the speculum. A 1000-Hz pure tone was presented at 60 dB HL for practice, followed by a series of pure tones at 1000 Hz, 2000 Hz, 4000 Hz, and 500 Hz, each presented at 40 dB HL. Participants were instructed to raise their hands when they heard a tone. The screening was conducted one time on each ear for each participant. Hearing loss was defined as a failure to respond to a 40 dB HL tone at 1000 Hz or 2000 Hz in both ears, or 1000 Hz and 2000 Hz in one ear (Ventry & Weinstein, 1983). The AudioScope3™ was found to have high sensitivity (94%) and specificity (72%-90%) when comparing Ventry and Weinstein's 40 dB HL screening criterion to a comprehensive audiologic evaluation (Lichtenstein, Bess, & Logan, 1988). The 500 Hz and 4000 Hz tones were presented because it was an automatic function of the AudioScope3™; however, only 1000 Hz and 2000 Hz were analyzed in accordance with the well-established screening criterion of Ventry and Weinstein (1983). Their screening criterion was selected because it has been suggested that most older adults would fail the screening criterion of 25 dB HL recommended by the American Speech-Language-Hearing Association Audiologic Assessment Panel 1996 (1997).

The study was conducted in quiet offices that were sparsely furnished and clean to avoid visual distraction. Ambient noise levels in the offices were not measured, but the investigators subjectively ascertained that the screening environment was satisfactory.

The goal of the hearing screening was not to identify all individuals with even a minimal hearing loss, who most likely would not report communication difficulties, seek professional help, or comply with treatment recommendations. The goal was to identify individuals with significant hearing loss and communication problems that may contribute to psychosocial difficulties (Weinstein, 2000). Although a diagnostic audiologic evaluation in a sound booth would be the desired measurement, audiometric equipment in the offices where the participants completed the study was not available. Either a licensed audiologist, or an audiology student under the supervision of a licensed audiologist, administered the above protocol.

RESULTS

General Findings

As can be seen in Table 1, 56 participants responded “yes” to the perceived hearing loss question, “Do you think you have a hearing loss?” and 35 participants responded “no.” Of the 56 participants who perceived hearing loss, 37 passed the hearing screening and 19 failed. Of the 35 participants who did not perceive hearing loss, 31 passed the hearing screening and 4 failed. Also seen in Table 1, the participants on average reported a relatively low level of hearing handicap as measured by the HHIE-S (total score <10). On the whole, participants rated their overall health as good (equivalent to a score of 2) and reported approximately 3 of the 10 chronic health conditions on the checklist.

Comparisons Between Perceived and No Perceived Hearing Loss

Results from participants who did and did not perceive hearing loss were compared as a function of participant age, gender, perceived overall health, and number of chronic health conditions. All comparisons were made using a 95% confidence interval. Independent sample *t* tests for equality of means were conducted to assess mean differences of factors using a corrected Bonferroni $\alpha = .01$ (Perneger, 1998). Equal variances were assumed for all comparisons. A summary of the findings can be seen in Table 2.

Significant differences were found between participants who did and did not perceive hearing loss for mean HHIE-S scores, including emotional and social subscale scores, as well as total scores. The mean HHIE-S scores were higher (more hearing handicap was reported) for participants who perceived hearing loss. Those who perceived hearing loss also reported significantly more chronic

Table 1
Hearing Screening and Self-Report Results Regarding Hearing and Health for 91 Older Adults

	<i>N</i>	%	<i>M</i>	<i>SD</i>
Perceived hearing loss	56			
Passed screening	37	66.1		
Failed screening	19	33.9		
No perceived hearing loss	35			
Passed screening	31	88.6		
Failed screening	4	11.4		
HHIE-S	91		7.7	7.8
Emotional	91		2.8	4.0
Social	91		4.9	4.7
Perceived overall health	88		1.9	0.6
No. of chronic health conditions	91		3.1	1.8

Table 2
Perceived Hearing Loss and No Perceived Hearing Loss Group Differences
as a Function of Age, Hearing Handicap, and Health

	Perceived hearing loss			
	Yes ^a		No ^b	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	75.2	6.8	75.9	7.2
HHIE-S (emotional)*	4.1	4.5	0.6	1.7
HHIE-S (social)*	6.6	4.5	2.2	3.8
HHIE-S (total)*	10.7	7.6	2.9	5.4
Perceived overall health	2.0	0.7	1.8	0.5
No. of chronic health conditions*	3.6	1.8	2.4	1.7

^a $n=56$, except for Perceived overall health for which $n=55$. ^b $n=35$, except for Perceived overall health for which $n=33$.

* $p < .01$

health conditions on the checklist than did participants who did not perceive hearing loss. No significant differences were found for mean age or mean overall perceived health.

Pearson Chi-Square tests also indicated no significant relationship between responses to the perceived hearing loss question and gender. Fisher's Exact tests were conducted to determine whether an association existed between responses to the perceived hearing loss question and each chronic health condition. A significant association was found between perceived hearing loss and sinusitis ($p = .03$, two-tailed). Those participants who perceived hearing loss were approximately three times more likely to report sinusitis than participants who did not perceive hearing loss. A significant association was found between perceived hearing loss (as measured by the question, "Do you think you have a hearing loss?") and self-reported "hearing impairment" on the chronic health conditions checklist ($p = .00$, two-tailed). Seventy percent of participants who perceived hearing loss reported hearing impairment and 100% of participants who did not perceive hearing loss denied hearing impairment.

Additional Analyses

Recall that the perceived hearing loss question in the study asked participants if they had a "hearing loss," and the term "hearing impairment" was among the top 10 chronic health conditions. There were 17 participants who responded "yes" to the perceived hearing loss question and "no" to the hearing impairment condition. Because this finding was unexpected, it warranted further analysis. No significant differences between the participants who showed a discrepancy and those who did not were found as a function of age, gender, perceived hearing handicap (all three HHIE-S scores), or health factors ($p > .05$).

Regression

Step-wise binary logistic regression analysis was conducted to determine whether any of the factors in the study predicted responses to the perceived hearing loss question. The analysis was made by entering age, gender, perceived overall health, self-perceived hearing handicap, hearing screening results, and number of chronic health conditions into the model ($\alpha = .05$). The binary logistic regression model suggested that the HHIE-S total score was the only significant predictor of a participant reporting a hearing loss, $R^2 = .392$, $\chi^2(6, N=91) = 29.80$, $p = .00$. These results suggest that the probability of reporting a hearing loss significantly increases as HHIE-S total scores increase.

DISCUSSION

Senescent changes in hearing sensitivity can have a significant impact on the quality of life of older individuals (Administration on Aging, 2001; National Council on the Aging, 1999). The primary treatment recommended to alleviate any communicative and psychosocial consequences of hearing loss in older adults is typically regular hearing aid use (Holmes, 1995). There is, however, a significantly low rate of hearing aid ownership by elderly persons with hearing loss (Jerger et al., 1995; Popelka et al., 1998). In addition, there is a notable discontinuance of hearing aid use by elderly individuals who own hearing aids (Popelka et al., 1998). One of the reasons repeatedly postulated for both lack of hearing aid ownership and discontinuance of hearing aid use in older adults is hearing loss denial (Maurer, 1998; Rawool, 2000). In this study, we evaluated acknowledgement of hearing loss by older adults who had no prior history of hearing aid use.

Hearing Loss Acknowledgement

Of the 56 participants who reported hearing loss on the perceived hearing loss question, ("Do you think you have a hearing loss?"), 37 passed the pure-tone screening and 19 failed (see Table 1). A somewhat unexpected finding was that some participants perceived hearing loss when actually they passed the hearing screening using the Ventry and Weinstein (1983) criterion. This finding may have occurred because these participants are acknowledging a hearing loss and/or hearing problem resulting from a minimal hearing loss, or a high-frequency hearing loss that would not be identified using a 40-dB HL screening criterion.

On the other hand, of the 35 participants who did not perceive hearing loss, 4 failed the pure-tone screening criterion and 31 passed. These 31 participants who did not perceive hearing loss may have normal hearing, or may have not noticed slight declines in their hearing over extended periods of time, or may have adjusted to the declines in their hearing over time. Even though mild hearing losses may cause communication difficulties, it could be that these 31 participants are

not experiencing communication difficulties significantly enough to be handicapping. The 4 participants who did not perceive hearing loss, but failed the pure-tone criterion, may truly not be acknowledging the effects of a significant hearing loss on their communication, or too may have adapted to declines in their hearing.

Dancer and Jackson (1996) had similar findings when using a perceived hearing loss question ("Do you have any loss of hearing at the present time?") with 100 older adults. They found that, of 46 older adults who perceived hearing loss, 34 failed to hear 2000 Hz at 40 dB HL. Of the 54 participants who did not perceive hearing loss, 48 passed the screening criterion, suggesting that 6 participants (11%) did not acknowledge hearing loss when a hearing loss was present. Our findings agree with this investigation because 4 of our 35 participants (11%) denied hearing loss when our screening results indicated at least a mild-to-moderate hearing loss.

Age

Erdman and Demorest (1998) reported that older adults are more willing to admit hearing loss and hearing problems than are younger adults. This may be because older adults do not view hearing loss as stigmatizing as do younger adults (Erler & Garstecki, 2002). In these studies, however, comparisons are often made between younger adults (30 to 50 years old) and those over 65 years. The present study aimed to determine if there were age differences within a group of older adults. One hypothesis in the current study was that participants who did not perceive hearing loss would be younger in age. The results, however, suggested that acknowledgement of hearing loss was not associated significantly with age.

Gender

Hearing loss acknowledgement may be different for men than for women (Garstecki & Erler, 1999). Héту et al. (1993) suggested that women are more likely to acknowledge hearing loss than are men. In the present study, however, we found no association between gender and perceived hearing loss. Our results may differ from those of Garstecki and Erler (1999) because the majority of our participants were women. It may be that gender differences exist, but that they could not be evaluated properly due to the relatively small number of men in the current study.

Perceived Hearing Handicap

Perceived hearing handicap was assessed via the HHIE-S (Ventry & Weinstein, 1983). It was thought that those participants who perceived hearing loss would also perceive hearing handicap, and to a greater extent than those participants

who did not perceive hearing loss. The results supported this premise in that participants who perceived hearing loss had significantly higher HHIE-S scores than those participants who did not perceive hearing loss. This finding supports the notion that people who perceive hearing loss are more likely to report emotional and social problems related to hearing loss than people who do not perceive hearing difficulties.

It is not surprising that individuals who perceive hearing loss may also perceive hearing handicap. Ventry and Weinstein (1983) reported that scores of 10 or more on the HHIE-S suggest a perceived hearing handicap. In our study, the mean total HHIE-S score for those who perceived hearing loss was 11, or a slight hearing handicap, with those who perceived hearing loss reporting more social (6.6) than emotional (4.1) consequences. As might be expected, the participants who did not perceive hearing loss did not perceive a hearing handicap (mean HHIE-S total score of approximately 3). This suggests that individuals who report hearing losses and hearing problems are also more likely to recognize significant psychosocial factors than individuals who do not report hearing loss and hearing problems. On the other hand, there were 4 individuals who did not perceive hearing loss and failed the hearing screening who also exhibited slight hearing handicap on the HHIE-S (11). Even though these 4 individuals reported some hearing handicap, they may not be ready to pursue treatment for their hearing loss (thus denying the significance of loss) or it may be that they interpret the meaning of the self-report question to be different from its intent.

Because the sensitivity and specificity of the self-report question (“Do you think you have a hearing loss?”) was not established in this study, it may not be a viable screening tool itself. Therefore, our results underscore the importance of screening for perceived hearing handicap in addition to pure-tone (or other audiometric measures) screenings to identify hearing problems in elders, rather than relying on either measure alone.

Health

Our supposition was that the participants who did not perceive hearing loss might have poorer perceived overall health than participants who perceive hearing loss. This hypothesis stemmed from the thought that older adults might be preoccupied with other chronic health conditions that they view as more serious, and therefore, may not acknowledge hearing loss (Maurer, 1998).

There was no significant difference in perceived overall health between participants who did or did not perceive hearing loss, but those who perceived hearing loss reported significantly more chronic health conditions. This difference disappeared when “hearing impairment” was removed from the checklist. It may be speculated that these two global measures of health, that is, the overall health rating and the health conditions checklist, were not sensitive enough to determine whether health factors are related to hearing loss perception. Perhaps observing

and/or rating the participants' Instrumental Activities of Daily Living, such as traveling and shopping, might have revealed an effect of functional health on the perception of hearing loss.

The association between perceived hearing loss and each of the chronic health conditions was assessed. Interestingly, those who perceived hearing loss were more likely to report sinusitis than participants who did not perceive hearing loss. An explanation of this finding might be that individuals who suffer from sinusitis, which can lead to middle-ear dysfunction, also recognize that their hearing is diminished as a result. They also may seek medical treatment for their sinusitis from primary care physicians and/or from Ear-Nose-Throat physicians, who may ask about hearing status and who may educate the patient about hearing loss.

Discrepant Report

A comparison of perceived hearing loss ("Do you think you have a hearing loss?") and self-report of "hearing impairment" on the chronic health conditions checklist yielded an interesting finding. Seventeen participants (19%) gave discrepant responses, unrelated to age or gender. The participants who reported hearing loss may not have reported hearing impairment on the checklist because it was embedded within a list of chronic health conditions such as hypertension and cataracts. It may be that their view of hearing impairment is not health-related or that hearing impairment is not thought of as a severe health problem such as the other conditions listed. It may be speculated that discrepancies between "impairment" and "loss" existed because participants were normalizing their hearing loss as suggested by Héту et al. (1993). These participants may have thought that "hearing impairment" meant "hearing problems."

This discrepancy might also be a way of preserving identity (Hansen, 1998). It is conceivable that older adults might be willing to report hearing loss because they view at least some degree of hearing loss as a normal part of the aging process. But if these participants believe that the hearing loss is not problematic, then they may indicate that they do not have hearing impairment. Their apparent differentiation of the terms "hearing loss" and "hearing impairment" may also result from a perspective that *impairment* tarnishes their view of themselves (and perhaps how others view them). Seventy-four participants (81%), however, did not show a discrepancy, suggesting that the majority of participants probably perceived the meaning of the terms "hearing loss" and "hearing impairment" similarly.

Predicting Perceived Hearing Loss

A goal of this study was to determine whether any of the study factors predicted self-report of hearing loss. The only predictor was perceived hearing handicap measured via the HHIE-S. The more hearing handicap a person reported on the HHIE-S, the greater the probability that the person also reported a

hearing loss. The more emotional and social problems individuals feel, therefore, the more likely they are to report a hearing loss. This finding might suggest that before individuals decide to seek audiologic evaluations and/or treatment for hearing problems on their own (i.e., not being “dragged” to the audiologist by their family), they probably become aware of the impact that hearing loss is having on their social and emotional well-being.

Future research in hearing loss acknowledgement is warranted based on the findings of this study. We find the discrepancies in reporting hearing loss and reporting problems associated with the hearing loss to be interesting. A study evaluating this in further detail may help explain the perceptions of older adults with respect to the meaning of different terminologies referring to *hearing loss*, *hearing impairment*, or *hearing problems*. In addition, further research should be conducted to continue to search for factors that affect hearing loss acknowledgement.

CONCLUSION

Our findings underscore the importance of using self-report measures during hearing evaluations with older adults. Information about perceived handicap, or hearing problems, was gained by HHIE-S results. Therefore, we suggest that self-report scales, such as the HHIE-S, continue to be used in conjunction with conventional audiologic testing to better understand the psychosocial impact of the hearing loss on the individual.

Our results also suggest that older adults do acknowledge hearing loss, even minimal hearing loss. Denial of hearing loss, therefore, may not be a primary issue for the elderly population. This finding is encouraging because other studies have demonstrated denial to be a problem with older adults (Erler & Garstecki, 2002; Héту et al., 1993). It must be noted that the participants in this study, even when acknowledging existing hearing problems, did not own hearing aids. Acknowledging a hearing loss, seeking treatment for hearing loss, and complying with treatment recommendations (i.e., hearing aids) are very different behaviors and the interplay of these behaviors is poorly understood. Audiologists often label older individuals as deniers just because they do not seek treatment for hearing loss or comply with treatment recommendations. Thus, the so-called “denier,” who may acknowledge his/her hearing loss at least in part, would receive no further intervention. In recent years, audiologists have shown a growing interest in the provision of hearing aid post-fitting orientation and counseling programs. Schow and his coauthors (Schow, Balsara, & Smedley, 1993) indicated that the majority of audiologists provide some form of education and audiologic rehabilitation after the fitting of hearing aids. Our results suggest that the scope of audiologic rehabilitation may need to be expanded to include pre-fitting counseling and education programs for older adults. Education regarding the effects of hearing loss on quality of life may be the key to increasing the number of

older Americans who avail themselves of various rehabilitation options such as hearing aids and other forms of assistive technology so that they can live life to the fullest.

ACKNOWLEDGEMENTS

Appreciation is expressed to Brooke Schoeffler for her assistance with data collection, and to Robin L. West, PhD, and Scott K. Griffiths, PhD for their assistance with statistical analyses. The comments of the anonymous reviewers and the editor were most helpful in preparing this manuscript. The authors are grateful that this project was selected by the Academy of Rehabilitative Audiology for the Herbert J. Oyer Student Research Award.

REFERENCES

- Administration on Aging. (2001). *A profile of older Americans: 2001*. Washington, DC: U.S. Department of Health and Human Services.
- American Speech-Language-Hearing Association Audiologic Assessment Panel 1996. (1997). *Guidelines for audiologic screening*. Rockville, MD: Author.
- Dancer, J., & Jackson, L. (1996). Value of self-identification of hearing loss in a screening program for older adults. *Perceptual and Motor Skills*, 83, 114.
- Erdman, S.A., & Demorest, M.E. (1998). Adjustment to hearing impairment II: Audiological and demographic correlates. *Journal of Speech-Language-Hearing Research*, 41, 123-136.
- Erler, S.F., & Garstecki, D.C. (2002). Hearing loss- and hearing aid-related stigma: Perceptions of women with age-normal hearing. *American Journal of Audiology*, 11, 83-91.
- Garstecki, D.C., & Erler, S.F. (1999). Older adult performance on the Communication Profile for the Hearing Impaired: Gender differences. *Journal of Speech, Language, and Hearing Research*, 42, 785-796.
- Hansen, V. (1998). Dealing with the psychological aspects of patient reluctance. *The Hearing Review*, 5, 8-14.
- Hétu, R. (1996). The stigma attached to hearing impairment. *Scandinavian Audiology Supplementum*, 43, 12-24.
- Hétu, R., Jones, L., & Getty, L. (1993). The impact of acquired hearing impairment on intimate relationships: Implications for rehabilitation. *Audiology*, 32, 363-381.
- Holmes, A.E. (1995). *Hearing aids and the older adult*. In P.B. Kricos & S.A. Lesner (Eds.), *Hearing care for the older adult: Audiologic rehabilitation* (pp. 59-74). Newton, MA: Butterworth Heinemann.
- Jerger, J., Chmiel, R., Wilson, N., & Luchi, R. (1995). Hearing impairment in older adults: New concepts. *Journal of American Geriatrics Society*, 43, 928-935.
- Lichtenstein, M., Bess, F., & Logan, S. (1988). Validation of screening tools for identifying hearing-impaired elderly in primary care. *Journal of the American Medical Association*, 259, 2875-2878.
- Maurer, J.F. (1998). Aging & hearing loss: The 50-plus years. *The Hearing Review*, 5, 28-36.
- National Center for Health Statistics. (1995). *Current estimates from the National Health Interview Survey: U.S. 1994* (Vital and Health Statistics, Series 10, #193). Washington, DC.
- National Council on the Aging. (1999). *The consequences of untreated hearing loss in older persons*. Retrieved January 30, 2003, from <http://www.ncoa.org/attachments/UntreatedHearingLossReport%2Edoc>
- Perneger, T.V. (1998). What's wrong with Bonferroni adjustments. *British Medical Journal*, 316, 1236-1238. Retrieved July 3, 2003 from <http://bmj.com/cgi/content/full/316/7139/1236?view=full&pmid=9553006>
- Pichora-Fuller, M.K., & Robertson, L.F. (1994). Hard-of-hearing residents in a home for the aged.

- Journal of Speech-Language-Pathology and Audiology*, 18, 278-288.
- Popelka, M.M., Cruickshanks, K.J., Wiley, T.L., Tweed, T.S., Klein, B.E., & Klein, R. (1998). Low prevalence of hearing aid use among older adults with hearing loss: The epidemiology of hearing loss study. *Journal of the American Geriatrics Society*, 46, 1075-1078.
- Rawool, V.W. (2000). A survey to help older clients accept hearing loss and hearing aids: Part I. *The Hearing Review*, 7, 34-41.
- Schow, R.L., Balsara, N.R., & Smedley, T.C. (1993). Aural rehabilitation by ASHA audiologists: 1980-1990. *American Journal of Audiology*, 2, 28-37.
- van den Brink, R.H.S., Wit, H.P., Kempen, G.I.J.M., & van Heuvelen, M.J.G. (1996). Attitude and help seeking for hearing impairment. *British Journal of Audiology*, 30, 313-324.
- Ventry, I., & Weinstein, B. (1983). Identification of elderly people with hearing problems. *ASHA*, 25, 37-42.
- Wiley, T.L., Cruickshanks, K.J., Nondahl, D.M., & Tweed, T.S. (2000). Self-reported hearing handicap and audiometric measures in older adults. *Journal of the American Academy of Audiology*, 11, 67-75.
- Weinstein, B.E. (2000). *Geriatric audiology*. New York: Thieme Medical Publishing.