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THE RELATIONSHIP BETWEEN COMMUNICATION PROBLEMS AND PSYCHOLOGICAL DIFFICULTIES IN PERSONS WITH PROFOUND ACQUIRED HEARING LOSS

JOHN F. KNUTSON CHARISSA R. LANSING*
University of Iowa, Iowa City

Communication strategies, accommodations to deafness, and perceptions of the communication environment by profoundly deaf subjects were correlated with indices of psychosocial adjustment to determine whether accommodations to deafness could play a role in the presence of psychological difficulties among deaf persons. Persons with postlingually acquired profound deafness were administered the Communication Profile for the Hearing Impaired (CPHI) and several standardized tests of psychological functioning and adjustment. Inadequate communication strategies and poor accommodations to deafness reported on the CPHI were associated with depression, social introversion, loneliness, and social anxiety. Limited communication performance at home and with friends was related to both social introversion and the experience of loneliness; perceived attitudes and behaviors of others correlated with depression as well as loneliness. In general, the pattern of correlations obtained suggests that specific communication strategies and accommodations to deafness, rather than deafness per se, may contribute to the presence of some psychological difficulties in individuals.

KEY WORDS: CPHI, deaf adults, psychosocial adjustment, self-assessment, cochlear implant candidates

A severe or profound acquired hearing loss can be associated with major changes in many aspects of one's life. Among the consequences of an acquired hearing loss are the development of psychological disturbance and disruption of social adjustment (Myklebust, 1960; Rosen, 1979; Thomas, 1981, 1984). Indeed, both clinical experience (e.g., Ramsdell, 1962) and systematic studies (e.g., Mahapatra, 1974; Myklebust, 1966) suggest that hearing loss can be associated with a significant disruption in psychological functioning. In one of the more extensive and systematic studies of the psychological consequences of acquired hearing loss, Thomas (1984) studied the psychological and social status of large cohorts of persons with varying degrees of hearing loss. Data provided by Thomas indicated that the samples with acquired hearing loss evidenced prevalence rates of psychological disturbance approximately four times that of the general population, with problems typically manifested in the domains of affect, loneliness, and interpersonal distress. Of course, not all persons with acquired hearing loss display those patterns of social and psychological dysfunction.

Considering the data provided by Thomas (1984), it seems appropriate to conceptualize acquired hearing loss as a risk factor for psychological disturbance, with the specific problems associated with the hearing loss being a function of some mediating personal or environmental variables. Among the personal attributes that could mediate the effect of acquired hearing loss on psychological functioning are the communication behaviors adopted by persons with a hearing loss and the degree to which those communication strategies meet their unique personal, occupational, and familial demands for communication. It is probable that poor or ineffective communication strategies would be associated with poorer psychosocial adjustments in persons with acquired hearing loss. Additionally, there was a suggestion in the Thomas data that severity of the loss could be a critically important factor in the psychosocial consequences of the hearing loss. Thomas did, however, note that there was a relative paucity of data on the effects of profound postlingually acquired hearing loss on psychological functioning.

The Communication Profile for the Hearing Impaired (CPHI) was developed as a self-report inventory of communication behaviors, their perceived effectiveness, and the presence of maladaptive accommodations to hearing loss (Demorest & Erdman, 1986, 1987, 1988). The CPHI assesses many facets of interpersonal functioning that can be influenced by hearing impairment and, consequently, focuses on hearing-related events. Although the CPHI has been used primarily to assess domains to target in audiological rehabilitative efforts, it seems likely the CPHI indices of communication strategies and reported difficulties by persons with acquired profound hearing loss would be associated with broader indices of psychological functioning not restricted to hearing-related events.

The present research was designed to assess whether the communication problems reported on the CPHI were associated with several psychological problems reported to be associated with deafness (e.g., Thomas, 1984). These problems include loneliness, depression, social anxiety, and a lack of assertiveness. In addition to those psychological problems, about which there is apparent consensus, suspiciousness was also included because it is a putative psychological problem associated with deafness about which there is considerable controversy. Although Thomas and others (e.g., Myklebust, 1966) have criticized the commonly held notion that hearing loss is

*Currently affiliated with University of Illinois at Urbana-Champaign.

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associated with increased suspicion, available data from this laboratory (Knutson, 1988) and from other laboratories (Cooper & Cunz, 1976; Crary, Berliner, Wexler, & Miller, 1982) indicate that persons with profound (pure-tone average ≥ 95 dB HL) hearing loss average one standard deviation above the population mean on Scale 6 (Paranoia) of the Minnesota Multiphasic Personality Inventory (MMPI) (Hathaway & McKinley, 1943). Because such data suggest that profound hearing loss could be a risk factor for suspiciousness, Scale 6 of the MMPI, an index of suspiciousness, was included in this research. Thus, the present study was designed to correlate the hearing-specific self-report measures of communication functioning from the CPHI with general measures of depression, loneliness, social isolation and anxiety, assertiveness, and suspiciousness in persons with profound postlingually acquired hearing loss.

METHOD

Subjects

Subjects were 27 consecutively referred candidates for cochlear implantation at The University of Iowa who completed presurgical psychological and aural rehabilitation protocols between April 1986 and September 1988. At the time of testing, all subjects displayed a profound (pure-tone average ≥ 95 dB HL), bilateral, postlingually acquired hearing loss. Subjects ranged in age from 22 to 71 years (M = 49.1, SD = 14.9). None scored higher than 4% correct when NU-6 word lists were presented at 60 dB HL in the sound field with appropriately fitted hearing aids. Under aided conditions, 7 subjects demonstrated improved performance on recorded audiovisual sentence material compared to that achieved in the vision-only presentation. None understood more than 10% of the words from the auditory-only presentation of the Iowa Sentences Without Context task from The Iowa Phoneme and Sentence Test (Tyler, Preece, & Tye-Murray, 1986). Table 1 shows the age, hearing loss, and amplification history of the sample. Fifteen of the subjects were women; 16 of the subjects were unemployed at the time of testing.

TABLE 1. Characteristics of subjects.

Subject	*Age at CPHI administration*[a]	*Age at onset of hearing loss*[a]	*Years of bilateral profound deafness*[a]	*Years of hearing aid use*[b]
1	46	44	2	1
2	32	3	15	20
3	37	22	5	4
4	32	7	1	15
5	50	26	7	21
6	67	51	8	5
7	28	birth	19	20
8	68	26	4	41
9	58	32	2	4
10	62	26	18	36
11	65	21	44	0
12	42	5	28	37
13	22	2	10	20
14	58	23	35	0
15	27	26	1	0
16	50	21	5	25
17	51	8	21	16
18	64	23	7	32
19	65	38	7	22
20	71	70	1	1
21	61	37	1	0
22	44	22	22	0
23	66	14	3	42
24	33	22	11	1
25	30	29	1	0
26	46	18	15	21
27	52	47	5	4
M	49.1	24.6	11.0	14.4
SD	14.9	16.2	11.2	14.3

[a]Rounded to nearest year; based on subject's report and verified by medical and audiological records when possible. [b]Cumulative experience since onset of hearing loss.

Test Instruments

The CPHI was designed to identify and quantify several variables related to an individual's adjustment to hearing loss. Responses to the 145 items provide 22 subscale scores. High profile scores are indicative of effective adjustment and communication performance, or the absence of difficulty, as appropriate (Demorest & Erdman, 1987). Related subscale scores may be combined to yield a number of composite scale scores. Because of the relatively small sample size in the present study and the greater reliability of expanded scales, and in an attempt to reduce the experimentwise error rate, several CPHI subscale profile scores were combined algebraically to form four composite scale scores. Because most of the sample of the present study was unemployed, those subscales most explicitly related to employment settings (Communication Performance at Work, Communication Need, Physical Characteristics) were deleted from the four composite scales. With this exception, the resulting composite scales were similar to the grouping of scales described by Demorest and Erdman (1987). A brief description of each composite scale follows. Content items are listed in the appendix.

The Communication Performance (CP) composite scale was based on responses to the Social Situations and At Home subscales. It assessed the frequency of effective communication in a variety of listening conditions. The Attitudes and Behaviors of Others (ABO) composite scale included responses to the Attitudes of Others and Behaviors of Others subscales. It assessed the respondents' perceptions of the social/emotional context in which communication takes place and the presence of problem-exacerbating communication behaviors of others. The Communication Strategies (CS) composite scale included Maladaptive Behaviors, Verbal Strategies, and Nonverbal Strategies subscales. It assessed the respondents' attempts to maximize communication effectiveness through

the use of adaptive and maladaptive verbal and nonverbal strategies. The Personal Adjustment (PA) composite scale was based on responses to nine subscales: Self-Acceptance, Acceptance of Loss, Anger, Displacement of Responsibility, Exaggeration of Responsibility, Discouragement, Stress, Withdrawal, and Denial. It included several affective components of the respondents' acceptance and adjustment to hearing impairment specifically related to communication behavior.

Five self-report measures of psychological distress and disturbance were used. To assess enduring personality patterns and behavioral styles, the full MMPI was administered to implant candidates, but for the purpose of the present study only scores from the Depression (Scale 2), Paranoia (Scale 6), and Social Introversion (Scale 0) scales were analyzed. As a second, but not redundant, measure of depressed affect, the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), was included. The BDI is among the most widely used indices of depressed mood states and symptomatology of depression in research on psychotherapy and pharmacotherapy for depression. As a measure of depression, the BDI is more sensitive to mood changes than is Scale 2 of the MMPI. In addition to Scale 0 of the MMPI, measures of social distress and social interaction were included to assess more fully the social experiences and adjustment of the participants. The UCLA Loneliness Scale (Russell, 1982; Russell, Peplau, & Cutrona, 1980), a measure of perceived loneliness, was included to amplify the measure of social introversion from the MMPI. The apparent loneliness and isolation reported by persons with acquired hearing loss and their relatives may be due to either limited interactive opportunities or active withdrawal from social settings. Therefore, a measure of anxiety and distress in social settings, the Social Anxiety and Distress scale (SAD; Watson & Friend, 1969), was included. The Rathus Assertiveness scale (Rathus, 1973) was included to assess the degree to which respondents described actively engaging their environment and their willingness to assert themselves under social conditions that call for such a response. The item content of these seven measures is not specifically related to hearing performance, and, thus, these measures do not overlap in content with the CPHI measures. The four composite CPHI scores were correlated with these seven measures of psychological difficulty.

Additionally, a separate analysis was conducted for Problem Awareness and Denial, two subscales that assess personal awareness of communication difficulties and denial of negative affect associated with hearing loss, respectively. The profile scores of these two subscales, referred to as Combined Denial (CD), were combined algebraically and correlated with two general measures of denial of affect or of personal problems, namely the L and K scales of the MMPI.

Procedure

Candidates for a cochlear implant at The University of Iowa Hospitals and Clinics participate in a multidisciplinary evaluation involving psychological, rehabilitative, audiological, otolaryngological, and radiological assessment over the course of several days. Most typically, candidates for the implant complete other screening and testing procedures before participating in the psychological and aural rehabilitation assessments. Thus, persons who are eliminated from the implant program because their hearing exceeds the criterion for admission to the program, or who are medically unsuitable, do not participate in the battery of psychological and aural rehabilitative tests. All participants completed questionnaires used in the present study no more than 3 months prior to a probable date for implant surgery.

One full day of the evaluation was devoted to the completion of a number of standardized and laboratory tests of psychological functioning. In addition to the measures included for the present study, measures of cognitive functioning, intellectual ability, and health compliance were included. The only modification in the administration of the standardized psychological tests was the use of supplementary written instructions presented on cards to facilitate instructions ordinarily received aurally.

A half-day aural rehabilitation protocol, designed to obtain baseline data on a candidate's communication behaviors, was also conducted. Performance measures of audiovisual sentence recognition, conversational discourse, and communication self-assessment were made. Subjects completed the CPHI in a quiet examination room apart from family or friends. Each subject was required to read the test instructions and accurately explain the use of the response scales to the trained staff member, who was available during the CPHI administration to answer any questions. At the completion of CPHI administration, the staff member checked to determine that no more than a single response was recorded for each item. Due to visual difficulties, 2 subjects were provided with a large print version of the questionnaire with response scales adjacent to each item rather than on a separate answer sheet. Three subjects chose to enter their numerical response on the questionnaire booklet of the CPHI rather than respond on the separate answer sheet usually used.

RESULTS

Table 2 shows the means, standard deviations, and ranges of the CPHI scale scores from the present study and some normative data. In order to determine whether the CPHI scores from the present sample were comparable to scores reported in other studies using the CPHI, the means and standard deviations of the individual scales making up the composite scale scores in the present study and the composite scores were compared with normative data obtained from subjects from the population described in previously published work (Demorest & Erdman, 1987). Although there is no reason to expect the scores from the present deaf sample to be similar to means based on mild to moderately hearing-impaired

TABLE 2. Descriptive statistics for selected scales of the Communication Profile for the Hearing Impaired.

Scale	M^a	SD^a	M^b	SD^b
Communication performance				
Social situations	2.70	0.69	2.43	0.80
At home	3.17	0.67	2.40	0.71
Attitudes and behaviors				
Attitudes of others[c]	3.50	0.76	3.72	0.77
Behaviors of others[c]	3.71	0.63	4.10	0.61
Communication strategies				
Maladaptive behaviors[c]	3.97	0.65	3.63	0.65
Verbal strategies	2.97	0.77	3.41	0.70
Nonverbal strategies	3.72	0.75	4.07	0.69
Personal adjustment				
Self-acceptance[c]	3.46	0.87	3.40	0.98
Acceptance of loss[c]	3.63	0.74	3.90	0.75
Anger[c]	3.20	0.72	3.52	0.75
Displacement of responsibility[c]	3.09	0.66	2.76	0.53
Exaggeration of responsibility[c]	2.91	0.73	2.84	0.87
Discouragement[c]	3.35	0.78	3.27	0.95
Stress[c]	3.12	0.86	3.02	0.96
Withdrawal[c]	3.24	0.87	2.63	1.04
Denial	3.43	0.77	3.44	0.82
Combined denial				
Problem awareness	4.09	0.49	4.15	0.59
Denial	3.43	0.77	3.44	0.82

[a]Descriptive data were taken from Demorest and Erdman (1987). Sample sizes for these statistics = 433 subjects from the Walter Reed Database. [b]Sample size = 27 adults presenting a postlingually acquired bilateral profound hearing loss and exploring candidacy for cochlear implantation. [c]Scoring is reversed for this scale.

military personnel, the scores are presented to aid the interpretability of the present data. Mean scores from the selected subscales were generally close to the scores from the Demorest and Erdman (1987) study for all subscales except Communication Performance at Home.

Table 3 includes descriptive statistics of the composite CPHI scores and each measure of psychological difficulty. The MMPI scale scores are expressed as standard *T* scores, with all the means approaching one standard deviation above general population means. Thus, the mean scores on the MMPI scales indicate that the sample was somewhat more depressed (Scale 2), more socially introverted (Scale 0), and somewhat more suspicious (Scale 6) than the general population. There was, however, a broad range of scores on these measures, with many subjects in the normal range and many evidencing clinically significant elevations. Similarly, although group mean scores on the BDI were in the normal range, reports of depressive symptoms for many participants were in the range of mild (10–18) to moderate (19–25) depression. The UCLA Loneliness Scale has been administered to a variety of groups, including the elderly and married couples, as well as dating and nondating university students. In general, loneliness scores show an inverse relationship to age, with the elderly appreciably less lonely than university students, and persons in stable relationships being less lonely than those who are lacking such relationships (see Russell, 1982). The mean UCLA score of this sample of postlingually deaf adults is comparable to that of nondating university students, indicating that the sample is comparable to the most lonely groups of people with whom the UCLA measure has been used. Although the range of scores indicates that not all of these profoundly deaf subjects are lonely, most could be described as ranging from somewhat lonely to extremely lonely. With respect to the reporting of anxiety and distress in social settings, the mean scores on the SAD were only slightly above the mean of hearing groups with which the measure has been used. Additionally, indices of dispersion from the present sample approximate those obtained from hearing samples. The mean Rathus score indicated that the sample was only slightly less assertive than nonclinical groups, but the range indicated that many subjects reported extremely unassertive patterns of behavior. Thus, although there were several indications of psychological adjustment difficulties in this sample of persons with acquired profound hearing loss, on all measures there was a sufficient range of scores to permit the planned correlational analyses.

TABLE 3. Descriptive statistics for composite CPHI scores measures of psychological function.

Measure	*M*	*SD*	*Range*
Communication performance	4.8	1.42	3.1–7.5
Attitudes and Behaviors of others	7.8	1.30	5.2–9.7
Communication strategies	11.1	1.30	8.3–14.2
Personal adjustment	28.8	5.12	19.9–38.8
Combined denial	7.6	1.27	4.8–9.4
MMPI-2[a]	57.4	13.0	38.0–99.0
MMPI-6[a]	57.9	6.6	44.0–70.0
MMPI-0[a]	59.5	11.5	39.0–80.0
BDI	5.9	6.2	0.0–27.0
UCLA	41.7	11.4	20.0–60.0
SAD	11.7	8.3	1.0–26.0
Rathus	−3.8	28.2	−56.0–53.0

Note. MMPI = Minnesota Multiphasic Personality Inventory [(2) = Depression; (6) = Paranoia; (0) = Social Introversion]; BDI = Beck Depression Inventory; UCLA = UCLA Loneliness Scale; SAD = Social Anxiety and Distress Scale; Rathus = Assertiveness Scale.
[a]*T* scores.

Table 4 shows the matrix of correlations between each of the four composite CPHI scores and the seven measures of psychological functioning. Because of the limited number of subjects and relatively large number of correlations calculated, statistical significance at $p \leq .01$ was required. With respect to affective state, the correlations between the Communication Strategies composite score and the two measures of depression suggested that the use of ineffective communication strategies may be associated with greater depressed symptomatology (BDI) and a more general pattern of depressed affect (MMPI-Scale 2). Interestingly, the MMPI Scale 2 scores did not correlate with other CPHI measures, whereas the BDI scores were highly correlated with the Attitudes and Behaviors of Others composite score and the Personal Adjustment composite score. Seemingly, attitudes and reactions of others to deafness, as well as limited accommodations or

TABLE 4. Correlations between composite CPHI scores and measures of psychological functioning.

Measure	*Communication performance*	*Attitudes and behaviors of others*	*Communication strategies*	*Personal adjustment*
BDI	−.31	−.68**	−.59**	−.66**
MMPI-2	−.29	−.18	−.44*	−.28
MMPI-6	−.22	−.14	−.31	.08
MMPI-0	−.46*	−.22	−.53*	−.55*
UCLA	−.50*	−.44*	−.59**	−.66**
SAD	−.27	−.34	−.43*	−.55*
Rathus	.35	.34	.36	.55*

Note. BDI = Beck Depression Inventory; MMPI = Minnesota Multiphasic Personality Inventory [(2) = Depression; (6) = Paranoia; (0) = Social Introversion]; UCLA = UCLA Loneliness Scale; SAD = Social Anxiety and Distress Scale; Rathus = Assertiveness Scale.
*$p \leq .01$. **$p \geq .001$.

adjustments to deafness, were associated with depressed symptomatology. The combined scores of communication performance (CP) at home and in social settings were not correlated with either index of depression.

With respect to patterns of social isolation, loneliness, and social anxiety, an overall pattern was apparent among the correlations. Social introversion, as measured by the MMPI Scale 0, correlated with the Communication Performance, Communication Strategies, and Personal Adjustment CPHI composite scores but did not correlate with the Attitudes and Behaviors of Others score. Thus, an introverted personality style was associated with poor communication strategies, limited communication strategies, and maladaptive adjustment to deafness. Social introversion did not, however, appear to be related to the perceived reactions to others. Interestingly, the loneliness measure (UCLA) correlated relatively highly with all of the CPHI composite scores, suggesting that a broad range of difficulties in communication and adjustment to the deafness, as well as the perceived behaviors of others, could all contribute to the pervasive loneliness of the profoundly deaf person. Social anxiety and distress (SAD) was correlated with poor personal adjustment and accommodation to deafness (PA), as well as ineffective communication strategies (CS), but it was not correlated significantly with the subjects' description of effective communication performance in social and home circumstances nor with descriptions of the behaviors of others.

The index of assertive behavior (Rathus) only correlated with the Personal Adjustment CPHI composite score. Somewhat surprisingly, but like the index of social anxiety and distress, the lack of assertive behavior was not correlated with respondents' descriptions of perceived negative attitudes and problematic behaviors of others. Thus, nonassertive behavior was only associated with poor personal accommodations and adjustments to the acquired hearing loss.

In addition to this correlation matrix, the MMPI L and K scales were correlated with the combined Problem Awareness and Denial scales of the CPHI. These two CPHI subscales were developed to assess response patterns characterized by a failure to acknowledge problems related to hearing loss as well as response bias that could limit the clinical interpretation of the CPHI Communication Performance and Personal Adjustment scales. Thus, to assess whether these hearing-specific scales related to more general personality or response bias patterns, the Combined Denial CPHI scores were correlated with the L and K scales of the MMPI. The correlations between the Combined Denial CPHI score and the MMPI L and K scales were not statistically significant (−.26 and −.01, respectively). Because some subjects with criterion level Denial scores and significantly elevated L and K scale scores were represented in the sample, and because there was considerable range on all measures, this absence of a significant correlation suggests that the CPHI Problem Awareness and Denial measures are not sampling a general attribute of a denial of problems, but are probably measuring a lack of problem awareness or a failure to acknowledge problems that are specific to the hearing loss.

None of the CPHI measures correlated significantly with Scale 6 of the MMPI. Thus, the greater suspiciousness reported by many of these profoundly deaf subjects could not be understood by using the CPHI measures that are related to hearing-loss-specific communication difficulties. Such data suggest that the suspiciousness that can emerge in persons who are profoundly deaf does not seem to be the function of any measured pattern of communication events. In that regard, it is particularly interesting that there was no significant correlation between the MMPI Scale 6 and the Attitudes and Behaviors of Others composite score.

DISCUSSION

The focus of this research was to assess whether communication difficulties and maladaptive accommodations to deafness were related to psychological problems commonly reported to be associated with deafness. Because the research participants in this study were seeking a cochlear implant, they were persons who were quite unhappy with their status as deaf persons. Moreover, they

were highly motivated to effect some change in their ability to respond to acoustic events. Thus, they are probably not representative of the general population of deaf persons, and they are certainly not representative of the general population of persons with an acquired hearing loss. In general, however, the present study suggests that some of the specific communication patterns and accommodations to hearing loss that deaf persons make can be related to their reports of affective difficulties and several psychological problems arising in interpersonal interactions. There is, of course, no evidence regarding a causal link between communication variables assessed with the CPHI and psychological difficulties in the present research. Yet, CPHI variables account for 20–40% of the variance in the more widely reported psychological difficulties associated with deafness (cf. Thomas, 1984). Thus, as experimental evidence of a causal relationship is awaited, the work does suggest some targets for rehabilitation efforts for those clients with acquired profound hearing loss who also present with problems of a psychological, social, or affective nature.

Interestingly, reports of poor personal adjustment to deafness were significantly correlated with all but Scales 2 and 6 of the MMPI. Thus, the data suggest personal adjustment and accommodations to deafness may be broadly related to symptoms of depression, social anxiety, introversion, lack of assertiveness, and loneliness. Similarly, ineffective communication strategies are associated with depression, social anxiety, and isolation as well as reports of extreme loneliness. Such data strongly suggest that efforts to improve communication strategies in social and interpersonal contexts as well as the adjustment to deafness may be particularly important in addressing the psychological concomitants of an acquired profound hearing loss.

The relative absence of correlations between the Attitudes and Behaviors of Others and the indices of psychological difficulty is, perhaps, remarkable. Only the scores on the BDI and the UCLA scales correlated with this CPHI measure, and the UCLA measure correlated with all of the CPHI composite scores. The modest contribution of the attitudes and behaviors of others to variance in psychological problems suggests that personal accommodations and strategies may be most important in rehabilitation designed to ameliorate emotional difficulties as well as helping persons adapt to a limited acoustic environment. Perhaps it is unnecessary to lament the fact that it is often impossible to intercede on behalf of the deaf person and alter the behavior of others in the client's extended environment. Vigorously targeting the personal adaptations of the deaf client may be sufficient.

The correlations between the Communication Performance composite score and the social introversion (MMPI-O) and the UCLA loneliness measure are also interesting. These data suggest that, for subjects who experience a profound acquired hearing loss, reports of limited communication performance with family and friends are not associated with the emergence of symptoms of psychopathology, but they are associated with a perception of isolation and loneliness. Thus, communication performance difficulties in more intimate settings may be linked with that pervasive loneliness that characterizes so many of these profoundly deaf subjects. Although communication in the home may not be a suitable target for dealing with depression, social anxiety, or suspiciousness, it may be a particularly appropriate target for alleviating feelings of loneliness.

Although there was considerable range in scores on Scale 6 of the MMPI, these scores did not correlate at all with the CPHI measures. Thus, although the Scale 6 group mean was higher than that of the general population, variance in suspiciousness cannot be attributed to the communication strategies or perceptions of the communication environment. Such data should not be taken as an indication that the obtained pattern of suspiciousness in these deaf clients is artifactual, but rather that some aspects of acquired hearing loss other than communication strategies assessed with the CPHI could be a contributing variable.

The composite CPHI scores in the present analysis reflect a rational combination of related domains consistent with the organization of CPHI scales reported by Demorest & Erdman (1986, 1987). Recently, Demorest and Erdman (1989) completed a factor analysis of the CPHI that identified five factors. Because of the unemployed nature of the present sample and the deletion of work-related subscales, the factor-analytically derived composite scores could not be used. Moreover, it is unlikely that the factor-based coefficients derived from a sample of hearing-impaired military personnel would be applicable in the present sample. Nevertheless, the factor loadings obtained by Demorest and Erdman suggest that the obtained correlations involving the Attitudes and Behaviors of Others and the Communication Strategies composite scores could reflect shared variance of the Interaction factor, a factor described as representing the interaction between the deaf person's behavior and his or her psychological environment. The Personal Adjustment composite scale in the present work consists of scales that load on the Adjustment factor. In addition, the scales used in the composite Attitudes and Behavior also load on the Adjustment factor. These two factor loadings of the scales making up the composite scores in the present study invite speculation that considerable variance in depression, loneliness, social introversion, social anxiety, and a lack of assertiveness among persons with acquired profound hearing loss could reflect the operation of just two processes represented by the factors of adjustment and interaction.

The present study involved only self-report measures, and there is, of course, the problem of shared method variance. However, the selected standardized tests of psychological functioning do not overlap in specific content with the CPHI scales, which focus on the communication environment as it relates to hearing. Thus, the results strongly support the possibility that the communication strategies adopted by persons with acquired hearing loss, as well as their particular accommodations to the hearing loss, could mediate the psychosocial adjustment difficulties that many persons with profound

hearing loss manifest. Of course, any conclusions regarding communication characteristics as mediating variables in psychological difficulties in deafness await experimental tests. Nevertheless, because social and emotional difficulties are widespread among persons with acquired hearing loss (e.g., Thomas, 1984), the present data do suggest assessing communication strategies and targeting them for intervention when planning aural rehabilitation for those persons with profound acquired hearing loss who also present with symptoms of depression and reports of social interactional difficulties.

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Requests for reprints should be sent to either John F. Knutson, Ph.D., Department of Psychology, The University of Iowa, Iowa City, IA 52242, or Charissa R. Lansing, Ph.D., Department of Speech and Hearing Science, University of Illinois at Champaign-Urbana, Champaign, IL 61820.

APPENDIX

COMPOSITION OF CPHI COMPOSITE SCALES

Item #	*Content*[a]
	Composite scale name: Communication Performance
Social Situations	
2	Social gathering, music/noise in background
5	Restaurant ordering food or drinks
7	Outdoor picnic
12	Dinner party with several other people
13	Listening to speaker at religious services
16	Conversation, social gathering, others talking
At Home	
1	Family talking while in car
3	At dinner table with family
8	Someone talking during TV or stereo
11	Talking on the telephone
15	Someone talking from another room
17	Talking with friend/family in quiet room
	Composite scale name: Attitudes and Behaviors of Others
Attitudes of Others	
23	Family gets annoyed when I don't hear
25	Others think I'm ignoring them
28	People think I'm not paying attention
46	People treat me as if I'm stupid
49	People get annoyed when asked to repeat
54	Others become impatient
59	People act frustrated
75	Others think I'm not interested
86	Others feel I use hearing loss as an excuse
111	Family doesn't understand strain and stress
Behaviors of Others	
33	Family members speak when not facing
35	People accuse me of hearing what I want to
52	Family members leave me out of conversations
55	Family members refuse to repeat more than once
56	Family members talk to me from another room
60	People don't speak clearly enough
61	People don't get my attention before speaking
66	People don't speak up
68	People say "never mind" or "forget it"
73	People mumble
	Composite scale name: Communication Strategies
Maladaptive Behaviors	
19	I get people to repeat by ignoring them
30	I interrupt others when listening is difficult
32	I dominate conversations to avoid listening
37	If someone is irritated, I stop asking for repeat
38	I avoid social situations if I'll have problems
41	I avoid conversing because of hearing loss
44	When I don't understand, I pretend I did
48	I avoid talking to strangers because of loss
58	When I don't understand someone, I ignore them
Verbal Strategies	
20	If I don't understand repetitions, I ask again
22	If I hear part, I only ask for repeat of rest
31	I've asked family to get my attention first
34	When I don't understand, I ask for repeat
47	When I have trouble, I remind of hearing problem
65	I've asked friends/co-workers to get attention
67	When I don't understand, I explain hearing loss
71	When someone speaks softly, I ask to speak up
Nonverbal Strategies	
26	Try to position myself to hear well
36	When having trouble, pay close attention to face
42	If I can't hear, I'll move to another seat
45	At parties, try to stay in well-lit area
53	When in group, try to sit where can hear better
64	In background noise, position so less distracting
69	When having trouble, listen for main points
72	Try to watch person's face when speaking
	Composite scale name: Personal Adjustment
Self-acceptance	
39	Get upset when can't follow conversation
57	Feel stupid when ask for repeat
70	Feel foolish when misunderstand
74	Get mad at self when can't understand
76	Feel embarrassed when ask for repeat
99	Hearing loss makes me feel incompetent
118	Because of hearing loss, feel inadequate
136	Feel self-conscious because of hearing loss
Acceptance of Loss	
24	Try to give impression of normal hearing
63	Try to hide hearing problem
83	Ashamed of hearing problems
105	Sensitive about hearing loss
108	Difficult to admit hearing problem to others
120	Bothers me to admit hearing loss
125	Can't talk to people about hearing loss
133	Hard accepting fact that I have hearing loss
140	Rather miss conversation than admit hearing loss
Anger	
82	My hearing loss makes me mad
103	Get aggravated when others don't speak up
117	Get impatient with those who won't repeat
119	Questions about my hearing loss irritate me
134	Really get annoyed when people shout
143	Get angry when can't understand someone
Displacement of Responsibility	
81	People should be more patient when talking to me
110	If I can't see them, they shouldn't expect answer
126	It's up to others to speak more clearly
129	Others should be more understanding of problems
137	If people mumble, they shouldn't expect to be understood
Exaggeration of Responsibility	
79	Hearing loss my problem; hate to bother others
89	Feel guilty about asking people to repeat
92	Hate to ask for special consideration
116	Feel bad about inconvenience to others
135	Try not to bother anyone when having trouble
144	Don't like to ask others to help
Discouragement	
107	Feel depressed as result of hearing loss
112	Get discouraged because of hearing loss
121	Problems communicating get me down
123	When can't understand, sometimes just don't care
132	I let my hearing problems get me down
142	Not understanding is very discouraging

APPENDIX *continued*

Item #	*Content*[a]
Stress	
78	Feel threatened by communication situations
85	Not relaxed when conversing with others
96	Not comfortable in communication situations
101	Get tense because of hearing loss
106	When I have trouble hearing, I become nervous
113	Worry about looking stupid when can't understand
114	Straining to hear upsets me
139	When I can't understand, feel tense and anxious
Withdrawal	
80	Feel left out of conversations
84	Withdraw from social talk because of hearing loss
104	Because of hearing loss, keep to myself
109	Don't enjoy going places with friends
131	Sometimes miss so much I feel left out
138	Feeling isolated is part of having hearing loss
145	Hearing difficulties restrict social/personal life
Denial	
90	Sometimes feel left out when I can't follow
91	Sometimes get annoyed when I have trouble hearing
94	When I have trouble hearing, I feel frustrated
100	It's frustrating when people refuse to repeat
102	Sometimes feel foolish when I misunderstand
122	Sometimes get angry at myself when I can't hear
127	Sometimes get tense when I can't understand
130	Sometimes feel embarrassed when I misunderstand
	Composite scale name: Combined Denial
Problem Awareness	
77	Sometimes have trouble if speaker in other room
88	Sometimes have trouble with background noise
95	Sometimes have trouble communicating
97	Sometimes hard to understand in large groups
98	At social gatherings, sometimes hard to follow
124	Sometimes difficult to follow if others talking
128	Sometimes have trouble understanding others during TV
141	Sometimes have trouble when can't see face
Denial	
90	Sometimes feel left out when I can't follow
91	Sometimes get annoyed when I have trouble hearing
94	When I have trouble hearing, I feel frustrated
100	It's frustrating when people refuse to repeat
102	Sometimes feel foolish when I misunderstand
122	Sometimes get angry at myself when I can't hear
127	Sometimes feel tense when I can't understand
130	Sometimes feel embarrassed when I misunderstand

[a]Unabridged items are given by Demorest and Erdman (1987).

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