CONTRIBUTED PAPERS

Audiologists Who Have Hearing Loss: Demographics and Specific Accommodation Needs

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The purpose of this study was to identify some of the needs that audiologists who have hearing impairment report relative to clinical and academic environments. This study also looked at the accommodations of which they were aware and those that were frequently employed. This information was obtained with a questionnaire that was distributed by mail to 184 audiologists and audiology students throughout the United States. Seventy-two questionnaires were returned, 41 of which were from practicing audiologists and audiology students with hearing loss. The responses revealed a relationship between severity of hearing loss and reported difficulty with audiological procedures. Most of the respondents experienced difficulty with some audiological procedures and used accommodations in clinical and academic settings, although a number of the respondents were unfamiliar with many available accommodations from which they might have benefited. These responses suggested that some audiologists who have hearing loss have specific needs in the practice of audiology and they might not be aware of, or familiar with the possible accommodations that may meet those needs.

In the general population at least 16% of all adults report having a permanent, significant hearing loss (Pleis & Coles, 2003). There is an estimated 464,000 to 738,000 persons in the United States with severe-to-profound hearing loss, and

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with 46% of this population under the age of 65, a substantial number of individuals with hearing loss are likely enrolled in schools or present in the workforce (Blanchfield, Feldman, Dunbar, & Gardner, 2001). Beyond the numbers of persons with hearing loss in the general population, it is likely that a portion of these individuals would be found in the profession of audiology due to their exposure to hearing-related services.

However, the profession of audiology can offer some challenging listening situations for audiologists with hearing loss. Within their scope of practice, as delineated by major audiology professional organizations, an audiologist is expected to perform a number of tests and functions that are largely predicated on the ability of audiologists to hear their patients (American Academy of Audiology, 2002; American Speech-Language-Hearing Association, 2004). For example, speech audiometry, the assessment of central auditory processing disorders, and speech and language screenings are within their scope of practice and usually require spoken responses from the patient; responses that need to be heard and understood by the audiologist. Audiologists also engage in many face-to-face conversations with patients that require the ability to hear and understand spoken comments and questions. Counseling and patient education sessions present situations in which audiologists need to be fully engaged in oral-aural communication. Other auditory dependent functions include the evaluation and fitting of sensory aids, which may involve listening checks of hearing aids and assistive listening devices. Given the numerous situations in which audiologists depend on their hearing abilities to serve their patients, accommodations for hearing loss may be necessary. Moreover, these accommodations should be investigated while individual students are in their audiology training programs so that they know what to request and expect when employed.

Elimination of Barriers

There are legal provisions intended to eliminate barriers and prevent exclusion of any individual with disabilities from pursuing educational or career opportunities (e.g., Rehabilitation Act of 1973, Americans with Disabilities Act of 1990, Individuals with Disabilities Education Act of 2004; U.S. Department of Justice, 2005). As a result it is important that audiologists and student audiologists know the rights and accommodations that they can expect for themselves and advocate for their patients.

Under these laws, students with disabilities have increased opportunity to succeed academically and attend undergraduate and graduate programs. Since 1990 there has been a significant increase in the number of students with disabilities seeking higher education. According to the National Center for Educational Statistics (NCES), which surveyed postsecondary students in 2003-2004, roughly 11% of the undergraduate students sampled reported having a disability; up from 6% in 1995-1996 and 9% in 1999-2000 (Horn & Berktold, 1999; U.S. Depart-

ment of Education, National Center for Education Statistics, 2003, 2006). Furthermore, 6% of graduate and first-professional students reported having a disability. Among the undergraduate students with disabilities, approximately 5% had a hearing impairment although there was no indication of the number of graduate students with hearing impairments or how they have fared in college. Moreover, little information is available on the number of deaf and hard-of-hearing students attending training programs in communication disorders, or audiology training programs in particular.

Provision of Accommodations

Accommodating professionals who have hearing loss has been evaluated within a number of disciplines (Dunlap & Grafton, 1996; Fabry, 1993; Gossett, 1998), but little has been done to assess the needs of audiology students and practicing audiologists. However, practicing audiologists should be aware of available accommodation options in order to meet the specific needs of their patients. So too, when they have a hearing loss or they are training a student who has a hearing loss, it is critical that the task demands associated with the practice of audiology be considered. With the rapid advances in digital communication technologies the methods for accommodating hearing loss during the practice of audiology likely will change rapidly.

The present study was designed to acquire information about audiologists and student audiologists who have hearing loss, and to identify the specific professional and academic needs of this population. The study also queried audiologists and student audiologists about their familiarity and use of accommodations.

METHODS

Inclusion Criteria

To be included in the study the respondents were required to confirm that they had a hearing loss, although there were no restrictions to severity or etiology. The survey further required that participants confirm their status as an audiologist or audiology student, and have a United States mailing address. The participants could be any age over 18 years but there were no restrictions on gender, race, or ethnicity.

Questionnaire

Information was collected from students and practicing audiologists with a paper and pencil questionnaire of mix composition that included fill-in, yes-no, and scaled items. The University of Pittsburgh Institutional Review Board approved the questionnaire and the study. The questionnaires were mailed to the participants along with a cover letter explaining the purpose of the study and the names of the investigators. A postage-paid envelope also was included. The

questionnaire was mailed to 143 randomly selected from the American Academy of Audiology membership directory. All of the listed members were assigned a number, the numbers were randomized, and the first 143 were selected. At the time of the mailing the American Academy of Audiology represented over 8,000 audiologists from the United States. In addition, participants were recruited through an announcement in the publication *Audiology Today* (Volume 15, Issue 1) and announcements sent by e-mail to universities in the United States with audiology degree-granting programs. The participants recruited through the announcements were required to contact the first author to request a copy of the questionnaire, which was mailed to them. Forty-one questionnaires were distributed in this manner. All participant responses were completely anonymous, although the postage mark on the return envelopes was recorded to evaluate the distribution of responses from across the country.

RESULTS

Due to confidentiality requirements, return rates for each type of mailing could not be determined. It is acknowledged that the randomly selected participants might have differed from those responding to the published or e-mailed announcement but the potential differences could not be determined due to the anonymity of the responses.

A total of 72 questionnaires were returned out of the 184 that were mailed, representing a 39.1% response rate. Because the survey was designed to examine the characteristics and needs of audiologists and audiology students who have hearing loss, the questionnaires returned from respondents who did not have a hearing loss were excluded from the analysis. As a result, 41 of the questionnaires were retained for analysis. The questionnaires returned from respondents who had normal hearing were assumed to be out of courtesy or because the cover letter was not read thoroughly.

Demographic Information

Based on the postage marks, not every state but all major areas of the country were represented by a respondent (e.g., southwest, northeast). Of the 41 respondents who confirmed they had a hearing loss, 80.5% reported that they were audiologists, and 19.5% reported that they are currently enrolled in a university degree program in audiology. All participants reported that they were over the age of 18 years. The ages of the respondents were widely distributed with 29.3% between 19-29 years old, 50.3% between 30-59 years of age, and 14.6% at 60 years of age or older (4.9% declined to report age). More men responded than women (31.7% female, 63.4% male, and 4.9% declined to report their sex), which is consistent with hearing being more common in men than women in the general population. Most of the non-student participants reported that they had been practicing in the field of audiology for more than 15 years (56.3%). The

Doctor of Audiology (AuD) was the most common (64%) degree reported by the respondents who indicated their highest degree attained although only 41.5% of the participants reported their highest academic degree. Table 1 shows the percentages of respondents' primary type of employment, their primary working environment, and highest degree attainment. The remaining responses from the participants were not differentiated by primary employment or work environment unless otherwise noted because of the limited numbers of respondents and because the respondents represented a range of activities typical of the profession of audiology.

Hearing and audiologic characteristics. The respondents were asked a number of questions about their hearing loss and a range of responses was obtained. The most commonly reported hearing-loss severity-category was mild-moderate (29.3%) while the least common were mild (7.3%) and severe-profound (7.3%).

Table 1

Employment and Educational Characteristics of the Respondents

Characteristics	Number of participants
Primary type of employment	
Student	9
Distance learner	1
Practitioner	25
University faculty	1
Administrator	2
Sales	0
Other	3
Primary work environment	
Student	9
Private practice	5
Hospital	8
Physician's office	7
Clinic	6
College or university	3
Primary or secondary school	1
Manufacturing facility	2
Military	0
Retired	0
Other	0
Highest degree attained	
BA or BS	1
MA or MS	3
AuD	11
PhD	2
No response	24

Another 2.4% of the respondents stated that their hearing loss did not fall under any of the given severity categories. Figure 1 illustrates the entire distribution of responses. In contrast, the types of hearing loss reported by the respondents were rather homogeneous. A majority indicated that they had a sensory-neural hearing loss (92%), while 4.9% reported a conductive hearing loss and 2.4% reported a mixed hearing loss. A little less than half (41.5%) of the respondents also indicated that their hearing loss was progressive. Most of the respondents reported that their hearing loss was bilateral (82.9%) and symmetrical (68.3%). In addition, 53.7% of the respondents reported that their loss was diagnosed in childhood between the ages of 0 and 12 years.

Sensory Aids

Wearing hearing aid use (80.5%) was found to be more common among the respondents than cochlear implants (9.8%), and most of the hearing aid users had worn their hearing instruments for more than 10 years (72.7%). In contrast, most of the cochlear implant users had worn their devices for only 1-2 years (75%). In addition, half of the cochlear implant users reported using a hearing aid in the opposite ear. Only 9.8% ($n = 4$) of the respondents reported not using either hearing aids or cochlear implants.

Hearing Loss Related Difficulties in Clinical Settings

When asked, in general, whether or not any audiology test procedures were difficult to perform as a direct result of their hearing loss, most respondents (78%) said yes. None of the participants with mild hearing loss ($n = 3$) found procedures to be difficult to perform; at least some of the respondents with more severe hearing loss had difficulty with audiology test procedures (see Table 2). However, it is interesting that 2 of the respondents reporting profound hearing loss also reported no difficulty with audiological procedures, which might be a reflection of the activities they do as audiologists.

The questionnaire provided a list of audiology test procedures that the respondents were asked to rate with a 5-point scale with 1 being *not difficult,* 2 being *slightly difficult,* 3 being *difficult,* 4 being *very difficult,* and 5 being *extremely difficult* (see Table 3). The test-procedures having the highest difficulty rating included hearing aid listening checks (67.5% > 1; $M = 2.48$), speech and language screenings (60.9% > 1; $M = 2.26$), speech audiometry testing (68.3% > 1; $M = 2.17$), central auditory processing testing (63.2% > 1; $M = 1.95$), and assistive listening device checks (54.3% > 1; $M = 1.94$). All of the test procedures received a rating of extremely difficult by at least 1 respondent but performing hearing aid listening checks was associated with the largest number of extremely difficult ratings. The test procedures that were less likely to be rated as difficult were puretone audiometry (7.3% > 1; $M = 1.15$), electrodiagnostic testing (12.5% > 1; $M = 1.25$), balance system testing (14.3% > 1; $M = 1.29$), aural reha-

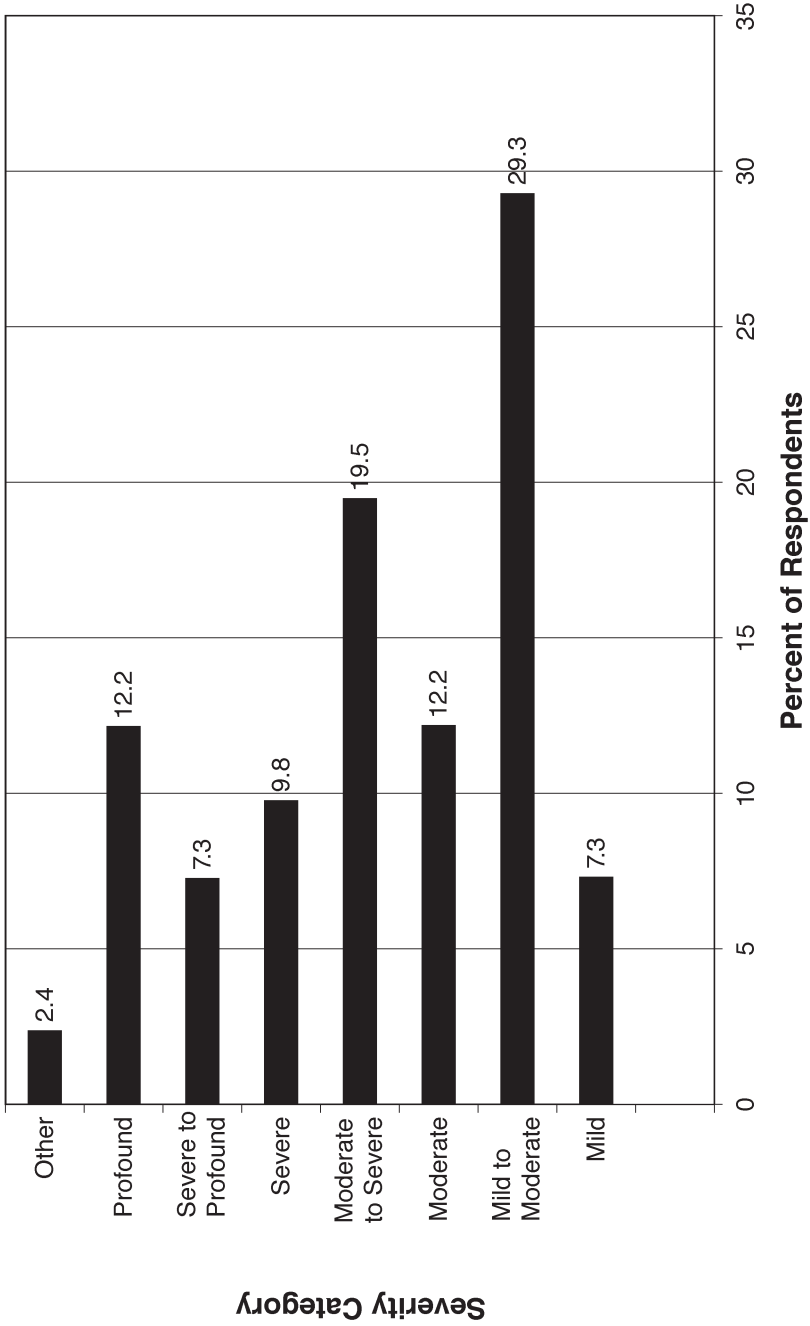

Figure 1. Hearing loss severity.

bilitation (18.5% > 1; $M = 1.296$), and patient counseling (18.5% > 1; $M = 1.30$). As tested with an exact Mann-Whitney Test, the respondents who had difficulty with certain audiology procedures also reported significantly more severe hearing loss than respondents who reported no difficulties (exact $U = 46.0$, $p = .017$).

Compensatory Measures

Audiology procedures. The respondents were asked to rate how often they used compensatory measures in clinical environments. Eight examples of compensatory strategies and modifications were provided and they were asked to rate frequency of use by using a 5-point scale with 1 being *never* and 5 being *always* (see Table 4). Of the compensatory measures provided on the questionnaire, the measure most used was strategic placement of patient to lip-read their verbal responses (55.3% > 1; $M = 2.84$). The remaining measures were not used by a majority of the respondents and some of the respondents were not familiar with many of the measures listed. However, at least 1 audiologist or audiology student confirmed some level of application for each accommodation option listed. The respondents also were asked to list any accommodations that they used that were not included in the list, and nine additional compensatory measures were offered: "Have someone else score the word recognition responses," "Increase the level of the talk-back," "Place a microphone on the patient in the booth," "Use a CD recording for speech audiometry," "Dim the lighting outside the booth for contrast," "Have a normal hearing colleague listen for feedback," "Ask a co-worker to assist with daily biological checks," "Wear earphones to listen to patient responses," and "Have the patient write their responses during word recognition testing."

When the respondents learned about accommodations and assistive devices de-

Table 2

Difficulty of Audiology Procedures Relative to Hearing Loss Severity

	Response					
Hearing loss severity	**Yes** ***n*** **(% within this category)**		**No** ***n*** **(% within this category)**		**Total** ***n*** **(% of all respondents)**	
Mild	0	(0.0)	3	(100)	3	(7.3)
Mild-Moderate	10	(83.3)	2	(16.7)	12	(29.3)
Moderate	5	(100)	0	(0.0)	5	(12.2)
Moderate-Severe	6	(75.0)	2	(25.0)	8	(19.5)
Severe	4	(100)	0	(0.0)	4	(9.8)
Severe-Profound	3	(100)	0	(0.0)	3	(7.3)
Profound	3	(60.0)	2	(40.0)	5	(12.2)
Other	1	(100)	0	(0.0)	1	(2.4)
Total	32	(78.0)	9	(22.0)	41	(100)

Table 3

Difficulty of Audiology Procedures

Procedure	Rating[a] 1–Not difficult *n* (%)	2 – Slightly difficult *n* (%)	3 – Difficult *n* (%)	4 – Very difficult *n* (%)	5– Extremely difficult *n* (%)	Mean *(SD)*
Electrodiagnostic testing	28 (87.5)	2 (6.3)	1 (3.1)	0 (0.0)	1 (3.1)	1.25 (0.80)
Balance system assessment	18 (85.7)	2 (9.5)	0 (0.0)	0 (0.0)	1 (4.8)	1.29 (0.90)
Puretone audiometry	38 (92.7)	2 (4.9)	0 (0.0)	0 (0.0)	1 (2.4)	1.15 (0.65)
Speech audiometry	13 (31.7)	16 (39.0)	6 (14.6)	4 (9.8)	2 (4.9)	1.15 (0.65)
Central auditory processing testing	7 (36.8)	8 (42.1)	3 (15.8)	0 (0.0)	1 (2.4)	1.95 (1.03)
Patient counseling face-to-face	33 (82.5)	5 (12.5)	0 (0.0)	1 (2.5)	1 (2.4)	1.30 (0.82)
Hearing aid listening checks	13 (32.5)	14 (35.0)	3 (7.5)	1 (2.5)	9 (22.5)	2.48 (1.54)
Assistive listening device checks	16 (45.7)	12 (34.3)	3 (8.6)	1 (2.9)	3 (8.6)	1.94 (1.21)
Speech and language screening	9 (39.1)	7 (30.4)	2 (8.7)	2 (8.7)	3 (13.0)	2.26 (1.42)
Aural rehabilitation evaluation	22 (81.5)	4 (14.8)	0 (0.0)	0 (0.0)	1 (3.7)	1.296 (0.82)
Conducting aural rehabilitation	22 (73.3)	5 (16.7)	1 (3.3)	1 (3.3)	1 (3.3)	1.47 (0.97)
Evaluation for cochlear implantation	4 (57.1)	2 (28.6)	0 (0.0)	0 (0.0)	1 (14.3)	1.85 (1.46)

[a]Participants were asked whether they had experience with the procedures. The respondents who did not have experience with the procedures were not included in the frequencies and percentages.

pended on the age at which their hearing loss was diagnosed. An exact Mann-Whitney Test (exact $U = 40.5$, $p < .000$) indicated that the respondents who were diagnosed with hearing loss before the age of 13 were more likely to learn about hearing-loss related accommodations as a child; whereas the respondents diagnosed later in life tended to learn about accommodations as an adult.

Telephone usage and accommodations. All 41 respondents confirmed that they used the telephone routinely in clinical settings and most reported that using the telephone was very important (70.7%). A small percentage of the respondents either rated the importance of phone use as neutral (12.2%) or somewhat unimportant (2.4%). None of the respondents reported that the telephone was completely unimportant. Moreover, there was little relationship between the importance of the telephone in clinical settings and hearing loss severity ($r_S = .093$, $p = .579$). Less than half of the respondents (41.5%) confirmed that they modified the telephone to accommodate their hearing loss and more than half (56.1%) confirmed that they sometimes had other people handle their telephone calls. Figure 2 details the telephone modifications.

The respondents also were asked if they substituted oral-aural telephone communication with other means of communication. Using the descriptors *always, sometimes,* and *never,* they were asked to describe their use of TTY, fax, and e-mail as a substitute for the telephone. Only a small percentage of the respondents reported using a TTY sometimes (12.2%), while 58.5% used e-mail and 48.8% used fax sometimes rather than the telephone. Few of the respondents reported always using these means of communication as a substitute for the telephone (2.4%). Although the importance of the telephone did not differ by severity of hearing loss, the respondents who sometimes or always used the TTY (exact $U = 32.0$, $p = .028$) or fax (exact $U = 119.0$, $p = .077$) as a substitute for the telephone were found to have significantly more severe hearing loss than respondents who never used the fax or TTY as a substitute for the telephone. The use of e-mail as an alternate means of communication did not differ significantly by hearing loss severity (exact $U = 135.0$, $p = .273$), which might reflect the widespread use of e-mail by the general population.

Accommodations in educational settings. Accommodations provided to audiology students in college and university settings also were investigated with the questionnaire. The intention was to identify any weaknesses in accommodations provided during the respondents' audiology training programs. The questions were designed so that each participant could identify if a specific accommodation was available in their program, and if so, how often they made use of the accommodation by rating it with a 5-point scale (1 = *never,* 5 = *always*). Although all of the respondents were encouraged to answer the questions regarding educational accommodations, only 19 of the 41 respondents completed this section even though a response of "do not know" was an option. The accommodations most frequently cited as being available included preferential seating (89%), as-

Table 4

Use of Compensatory Measures

Measures	Rating						
	1– Never *n* (%)	2 – Occasionally *n* (%)	3 – Half the time *n* (%)	4 – Frequently *n* (%)	5– Always *n* (%)	Do not know of measure *n* (%)	Mean[a] *(SD)*
Personal FM system in booth w/patient	28 (68.3)	5 (12.2)	0 (0.0)	2 (4.9)	2 (4.9)	4 (9.8)	1.51 (1.12)
Audiometer coupled with external speakers	28 (68.3)	4 (9.8)	1 (2.4)	1 (2.4)	3 (7.3)	4 (9.8)	1.57 (1.21)
Induction loop coupled with audiometer	29 (70.7)	0 (0.0)	0 (0.0)	1 (2.4)	0 (0.0)	11 (26.8)	1.10 (0.55)
Direct audio input coupled with audiometer	31 (75.6)	2 (4.9)	1 (2.4)	0 (0.0)	0 (0.0)	7 (17.1)	1.12 (0.41)
Special listening scope for hearing aid listening checks	25 (61.0)	1 (2.4)	0 (0.0)	1 (2.4)	5 (12.2)	9 (22.0)	1.75 (1.52)
Amplified stethoscope modified for hearing aid listening checks	29 (70.7)	0 (0.0)	1 (2.4)	1 (2.4)	2 (4.9)	8 (19.5)	1.39 (1.12)
Strategic placement of patient: Audiologist may lip-read verbal responses	17 (41.5)	4 (9.8)	0 (0.0)	2 (4.9)	15 (36.6)	3 (7.3)	2.84 (1.90)
Substitute another test in place of conventional speech tests	31 (75.6)	2 (4.9)	0 (0.0)	1 (2.4)	1 (2.4)	6 (14.6)	1.26 (0.85)

Other: 1. Have someone else score word recognition testing. 2. Turn up the "talk-back" on the audiometer. 3. Place a microphone on the patient in the booth. 4. Use CD recording for speech audiometry. 5. Dim lighting outside of patient booth for contrast. 6. Have normal hearing colleague listen for feedback. 7. Ask co-worker to aid with daily biological check. 8. Wear earphones to listen to patient responses. 9. Have patient write answers to word recognition testing

[a]Mean calculated without the responses from participants who did not know of the strategy.

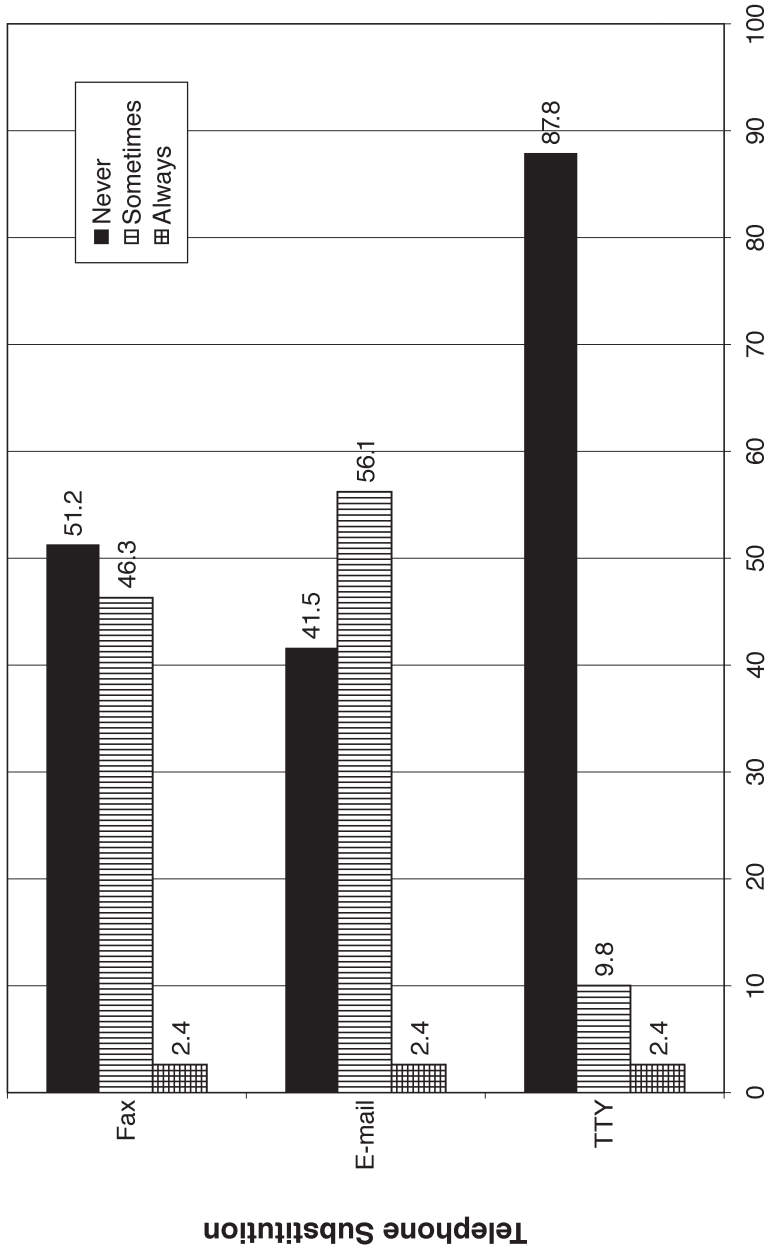

Figure 2. Telephone modifications.

sistive listening devices for classroom lectures (78.9%), note-taking services (73.7%), assistive listening devices for seminar events (63.2%), and closed captioning for television/video segments of class (52.6%). The remaining accommodations were reported as available by less than half of the respondents and frequently they did not know if they were available. A little over half of the respondents reported not knowing whether the following accommodations were available in their training programs: transcription services for video conferences (52.6%), seminars (57.9%), and teleconferences (57.9%) and captioning for video conferences (52.6%). Furthermore, slightly less than half of the respondents (41.1%) did not know if assistive listening devices were available in their clinical placements or rotations.

Of the accommodations reported as available, preferential seating (89.5%; $M = 2.53$) was rated as the most used followed by note-taking services (52.6%; $M = 2.53$) and assistive listening devices in the classroom setting (47.4%; $M = 2.16$). The only accommodation on the list that was never used by all participants was transcription services for teleconferences on campus. Many of the accommodations were rated low for usage (see Table 5). The respondents (70.6%) largely believed that accessibility services, such as assistive devices, were not difficult to obtain in their training programs. A small percentage believed that because of their hearing loss they had problems fulfilling the requirements of their academic program (7.5%, $n = 3$) and for clinical certification through the American Speech-Language-Hearing Association (5.0%, $n = 2$).

DISCUSSION

Characteristics of Audiologist Who Have Hearing Loss

Although the results were obtained from only 41 respondents, a range of audiologists were sampled and represented by the data. A diverse age-range and years of experience was represented, as were both sexes and all major regions of the country. The audiologists came from a number of career backgrounds and with a diversity of degrees and credentials. Audiometric characteristics of their hearing losses also were mixed with at least 3 participants in each hearing-loss severity category. However, most of the respondents had a bilateral sensorineural hearing loss, although some of the respondents had conductive, mixed, and unilateral losses. The respondents were evenly split between being diagnosed as children before the age of 13 and being diagnosed after the age of 13 years. It was not surprising that most of the respondents wore hearing aids, but 4 reported using cochlear implants and 4 indicated that they did not wear hearing aids or cochlear implants. The diversity of the respondents provided a broad picture of the target population, but it also might have diluted the issues and problems experienced by particular groups. For example, the audiology students might have experienced different problems and viewed accommodations very differently in

Table 5

Student Accommodations in Audiology Academic Programs

Accommodation	% Availability			Rating[a]					
				1 – Never	2 – Sometimes	3 – Half the time	4 – Frequently	5 – Always	
	Yes	No	Don't know	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	Mean (*SD*)
Preferential seating for class lectures	89.5	0.0	10.5	2 (10.5)	3 (15.8)	0 (0.0)	3 (15.8)	11 (57.9)	3.94 (1.51)
Note taker for class lectures	73.7	10.5	15.8	9 (47.4)	3 (15.8)	0 (0.0)	2 (10.5)	5 (26.3)	2.53 (1.78)
Assistive listening device for class lecture	78.9	10.5	10.5	10 (52.6)	3 (15.8)	1 (5.3)	3 (15.8)	2 (10.5)	2.16 (1.50)
Captioning for television/ video segments of class	52.6	21.1	26.3	11 (57.9)	3 (15.8)	0 (0.0)	2 (10.5)	3 (15.8)	2.11 (1.59)
Assistive listening device for seminars on campus	63.2	15.8	21.1	12 (63.2)	2 (10.5)	0 (0.0)	2 (10.5)	3 (15.8)	2.05 (1.61)
Assistive listening device for group meetings	42.1	26.3	31.6	12 (63.2)	2 (10.5)	2 (10.5)	2 (10.5)	1 (5.3)	1.84 (1.30)
Assistive listening device for clinic placements	31.6	26.3	42.1	14 (73.7)	2 (10.5)	1 (5.3)	0 (0.0)	2 (10.5)	1.63 (1.30)

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Table 5 *continued from page 24*

	% Availability			Rating[a]									
				1 – Never		2 – Sometimes		3 – Half the time		4 – Frequently		5 – Always	
Accommodation	**Yes**	**No**	**Don't know**	***n***	**(%)**	***n***	**(%)**	***n***	**(%)**	***n***	**(%)**	***n***	**(%)**	**Mean *(SD)***
Captioning for video conference on campus	15.8	31.6	52.6	17	(89.5)	0	(0.0)	0	(0.0)	0	(0.0)	2	(4.9)	1.42 (1.26)
Assistive listening device for school social events	36.8	36.8	26.3	16	(84.2)	1	(5.3)	0	(0.0)	1	(5.3)	1	(5.3)	1.42 (1.12)
Transcriptionist for seminars on campus	5.3	36.8	57.9	17	(89.5)	0	(0.0)	0	(0.0)	1	(5.3)	1	(5.3)	1.37 (1.12)
Transcriptionist for video conferences on campus	5.3	42.1	52.6	17	(89.5)	1	(5.3)	0	(0.0)	0	(0.0)	1	(5.3)	1.26 (0.93)
Transcriptionist for class lectures	36.8	26.3	36.8	16	(84.2)	2	(10.5)	0	(0.0)	1	(2.4)	0	(0.0)	1.26 (0.73)
Transcriptionist for tele-conferences on campus	10.5	31.6	57.9	19	(100)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	1.00 (0.00)

[a]Percentage shown is based on the data provided by the 19 respondents who completed these items on the questionnaire.

the clinic than the practicing clinicians. So too, those with congenital and early acquired hearing losses might have viewed the need for accommodations differently than those audiologists and student audiologists who acquired their hearing losses later in life.

Difficulties and Specific Needs

In general, the results of this survey confirmed that audiologists with hearing loss have difficulty with many activities common to the practice of audiology, and therefore present specific needs that require accommodation. More than half of the respondents (70.7%) agreed that telephone usage was very important in their audiology-related activities, yet only 56.1% confirmed that they had other people handle their telephone calls at least sometimes. Some respondents stated that they modified their telephones to compensate for their hearing loss. There was some reported use of substituting the telephone with other communication devices such as the TTY, fax, or e-mail although it is acknowledged that faxes and e-mail are increasingly used in the general population and might not be viewed as an accommodation. However, given these results, and the importance of being able to use a telephone, it seems that audiologists and audiology students might need to increase their use of telephone modifications or substitutions when practicing audiology.

Most of the participants agreed that they had difficulty with some audiology procedures, with only those respondents with mild hearing loss reporting having no difficulties. When asked to rate the difficulty of different audiology procedures, the activity considered most difficult by the respondents was performing hearing aid listening checks. Other difficult tasks included conducting speech and language screenings, speech audiometry tests, central auditory processing tests, and assistive listening device checks. It was not unexpected that these procedures were considered difficult because they typically require auditory perceptual judgments from the examiner. So too, the procedures that were least auditory dependent were rated as least difficult (e.g., puretone audiometry and electrodiagnostic testing). However, at least one respondent rated each of the listed audiology tasks as extremely difficult. Given these results, it appears that a substantive number of audiologists and audiology students who are deaf or hard-of-hearing require some accommodations when practicing in typical clinical settings. The accommodations will be task and individual specific, although most will likely be applied to auditory dependent activities. The results further suggest that audiologists with hearing loss, and clinical faculty who supervise students with hearing loss need to actively analyze their clinical environments and activities to determine when and how to best make accommodations.

The need to actively investigate difficult tasks and implement appropriate accommodations was highlighted by the reported compensatory measures that were already being used in clinic settings by the respondents. The questionnaire also

revealed that some participants were not familiar with range of accommodation options. There were a couple of strategies that received somewhat noteworthy usage (i.e., strategic placement of the patient to lip-read their verbal responses, and special listening scope for hearing aid listening checks). Not surprising, these strategies addressed the most auditory challenging of the audiology procedures offered in the questionnaire. Although some participants indicated that they were not familiar with some of the accommodations listed, a number of the respondents offered accommodations of their own, suggesting that they were aware of the need to compensate for their auditory challenges. Some of the compensatory strategies might have had limited effectiveness, and might reflect limited knowledge of the potential compensatory measures that could be used to make their professional lives easier and more functional. However, it should be noted that the accommodations listed in the questionnaire are associated with little or not documentation of effectiveness.

Another expected finding was that with increased hearing loss, the respondents experienced a wider range of difficulties and had more extreme difficulties than the respondents with less severe hearing loss. However, it is important to state that even the respondents with mild-moderate hearing loss reported difficulty with some audiology-related tasks. Therefore, accommodation issues are relevant regardless of hearing loss type and severity. It should be acknowledged that information about speech recognition abilities was not queried and would have been relevant to the need for compensatory measures.

Accommodations for Audiology Students

Students often enter academic programs believing the faculty and administration will know how to help them succeed. Furthermore, these students might not come with the knowledge and skills needed to accommodate their hearing loss in academic and clinical-training settings. A substantive number of the audiology students sampled in this study were not entirely familiar with the range of compensatory measures that they can request. The respondents that completed the academic accommodation section ($n = 19$) confirmed that they had limited knowledge about whether certain accommodations existed in their academic training programs such as transcription services, captioning, and assistive listening devices in clinical placements or rotations. The accommodations that were frequently reported as being available and used most frequently included preferential seating, note-taking, and assistive listening devices for class lectures. These accommodations are commonly used in primary and secondary educational settings and may represent measures that were transitioned into college and university settings. These results also might reflect a lack of awareness by the students, parents, faculty, and administrators of other means of accessibility that exist. In most academic and clinical settings students have to self-identify themselves as having a hearing loss and advocate for services and accommodations beyond the

minimum available. In order to become effective self-advocates students need to be informed of their options, as do the faculty and administrator who assist and supervise students with hearing loss (U.S. Department of Education, Office for Civil Rights, 2007). The current study suggests that knowledge of compensatory measures can impact clinical function as the respondents who used accommodations during their academic programs tended to rate accessibility as not difficult to attain (70.6%). Given the communication needs of audiologists and audiology students, and that some are unfamiliar with accommodation options; it appears that this is an area that should be addressed vigorously by clinical training programs.

CONCLUSIONS

Despite its limitations, the results of this survey could serve as a reference for individuals with hearing losses who are considering a profession in audiology, as well as those who are practicing audiologists. The results also might be useful for employers, and faculty and administrators in academic training programs. The accommodations listed previously could serve as a starting point for investigating appropriate accessibility options for audiologists and students with hearing loss. The results also call for increased education and research about accessibility options for the general population of individuals with hearing loss. As the respondents in this study (audiologists and student audiologists) were largely unfamiliar with their own options, it is unlikely that the general population with hearing loss would have sufficient knowledge to self-advocate for accommodations without assistance. Audiologists are the primary resource for this type of information and therefore need increased exposure to the wide range of accommodations that are available. Furthermore, additional research is needed to determine the best ways to tailor accommodations to individual needs. Not all the accommodations reported as currently being used by the respondents appeared to be appropriate for all the areas in which need was reported. For example, some participants reported using a modified listening scope for hearing aid checks, but this may not be suitable for all audiologists with hearing loss as they may have more severe hearing loss and cannot depend on a listening scope. For these audiologists more instrumental measures may be needed, such as using a hearing aid test box or real ear measurements to verify hearing aid function. Determining what will likely work best with certain individuals should be investigated further, as well as potential accessibility options.

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