

Chapter Eight

Other Evaluative Procedures

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INTRODUCTION

In the past, physiological and audiological measurements were often assumed to be sufficient for fitting an appropriate hearing aid. However, we have finally realized that the whole individual must be considered: the physical ability to manipulate a hearing aid, the attitude toward possessing a hearing aid, the lifestyle, and the audiological needs are all factors influencing whether or not someone is a suitable candidate for a hearing aid, what model of hearing aid will be most appropriate, what counseling and advice should be given at the time of fitting, and what follow-up of satisfaction and benefit is appropriate. In this chapter, other evaluative procedures will be discussed and some standards for their application in the clinic provided.

It is realized that audiologists are usually stressed for time and their clients are already bombarded with lots of tests and new information. Thus, the prospect of incorporating more evaluations into an already tight clinical procedure may seem somewhat daunting. However, the evaluations suggested in this chapter are simple and

straightforward, and generally require little additional clinic time. In fact, in many instances the information is already there, but not necessarily used. The purpose of this chapter is not to add tests, but to show the way the audiologist can best use and interpret the information he or she may already have available.

Throughout the chapter it is assumed that the client is an adult, fundamentally in good physical and mental health, with a mild-to-severe late-acquired hearing loss. Information for audiologists interested in pediatric and special populations is readily available elsewhere (1–3).

MODELS OF HEARING DISABILITY AND HANDICAP

It is now widely recognized that audiological measurements do not provide a complete characterization and understanding of the hearing status of an individual. We know that there is only a moderate-to-poor correlation between audiometric results and reported disability and handicap (4–8), and that audiometric data do not explain the different degrees of benefit and satisfaction individuals receive from hearing aids (9,10).

In the context of the present discussion, the terms “impairment,” “disability,” and “handicap” are used in

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accordance with the definitions of the World Health Organization (11), in which “impairment” is defined as “an abnormality of structure or function at the organ level” (e.g., hair cell damage), “disability” as “the functional consequences of an impairment” (e.g., inability to understand speech in a noisy environment) and “handicap” as “the social consequences of an impairment or disability” (e.g., the feelings of isolation from being left out of conversations). In addition, “benefit from a hearing aid” is used in the context of both decreased disability (improved performance or fewer reported difficulties) and decreased reported handicap. Finally “hearing aid satisfaction” combines all aspects of disability, handicap, and usage: it is the extent to which the individual is content with the hearing aid he or she has. Satisfaction is usually assessed anecdotally from the user.

This chapter is based on two models of hearing loss: the philosophical standpoint of Noble, put forward in his ‘ecological’ model of hearing (12), and the ‘model for management’ advanced by Goldstein and Stephens (13).

Noble’s ecological model challenges the assumption that hearing and hearing impairment can be understood purely in terms of physics and biology. Rather it views the individual, or ‘perceiver,’ as an active explorer of his/her environment. Noble says that individuals are not only governed by the capabilities of their auditory system and the physics of sound but also by their attention and interest in the environment and their motivation to hear. Interpretation of auditory input is based upon the context in which it occurs. Noble views hearing as being both active (e.g., concentrating on a television program) and passive (e.g., noticing an airplane fly overhead). The outcome is that a nonhearing-impaired individual is shaped by the audible world. That is, all of our auditory contacts (casual, formal, and deliberate) form our status as a person and our image of others. We are sensitive not only to the overall auditory input, but to the subtle nuances of warmth, boredom, sarcasm, and the like. Individuals with hearing impairments, on the other hand, lose much of the audible world that people with unimpaired hearing take for granted, and thus their view of the world must necessarily differ. The goal of hearing aid manufacturers and audiologists is to restore that person’s impaired hearing to ‘normal,’ enforcing the view that hearing impairment is abnormal and that one must strive for normal hearing. This attitude imposes upon the individual the need to ‘act’ in order to be accepted: for instance, persons with hearing impairments often pretend to hear when really they do not. This need to be an actor, and often to

fail, causes the individual to feel isolated and worthless in the ‘normal’ world. Thus, Noble argues that rather than trying to restore hearing to normal, we should aim to expand the ‘normal’ world to accommodate a larger variety of human beings.

Goldstein and Stephens also approach the management of hearing loss from the point of view that the whole individual must be considered. They proposed a management model that integrates the many aspects of the rehabilitative process into one and aims to ensure that clinicians are made aware of more than, and consider more than, the provision of a prosthesis based upon an audiometric configuration. Their model consists of a number of flowcharts through which a clinician can work. While a large part of their management model consists of restoring the ‘normal’ audible world to the listener with hearing impairment and is thus in contrast to Noble, they also consider the impact of hearing loss upon the individual’s whole being (13).

The remainder of this chapter is divided into sections that describe evaluations that should be made prior to beginning a rehabilitative program. Each section consists of recommended evaluations, an explanation of why they are felt to be necessary, and the possible ramifications of omitting them.

MENTAL AND PHYSICAL STATUS DURING INITIAL EVALUATION

1. Assess the client’s mental status while taking the case history and during initial audiometric evaluation by observation. Pay particular attention to the client’s memory, understanding of spoken English, level of fatigue, and concentration.
2. Check the ear canal for obstruction and collapse using an otoscope.
3. Determine whether the client has any physical limitation(s) that will impact upon his or her ability to carry out testing.

A client with memory and concentration problems may have erratic or inconsistent test responses. Less formal testing or a short screening procedure may be necessary. A sudden deterioration in performance might suggest that the client’s ability to concentrate has reached its limit or that he or she has even fallen asleep. A short break in the testing or carrying out testing over 2 days might be the best way to achieve accurate assessment. Unexpectedly high pure tone thresholds might be due to

ear canal collapse. If otoscopy shows this to be so, use insert phones rather than headphones.

Accurate thresholds will best be obtained if the client is comfortable and calm. Therefore, as far as is possible, the test booth should be kept at a moderate temperature, the client should be given encouragement frequently and offered a break if the test session is lasting a long time. Positive reinforcement is particularly important for the anxious client or for someone with low self-esteem. Clients with physical disabilities should be permitted to respond during audiometry using whatever technique they find most comfortable (i.e., raising a hand vs. giving a verbal response vs. pressing a response button).

Ultimately it must be remembered that rehabilitation is based upon the findings of initial audiological assessment. Thus, accurate assessment is crucial. If this requires a longer than usual test session, or two short sessions, then so be it. In the long term, satisfaction with rehabilitation will only be obtained if it has a valid basis.

NATIVE LANGUAGE

In a multicultural society such as ours, it is not uncommon to encounter non-native speakers of English whose linguistic abilities will possibly impact upon audiological testing and counseling. The audiologist should take note of

- how well the client speaks and understands English
- how many years the client has been using English
- whether English is used on a daily basis at home or just as needed outside the home.

A translator/interpreter may be required for a client who speaks little or no English. The audiologist should suggest that an English-speaking relative or friend accompany the client to the appointment.

Aside from instructing the client, most audiometric procedures do not require spoken language. Thus, where necessary, speech testing can be omitted and clients can be properly assessed and provided with appropriate amplification using pure tone audiometry, tympanometry, and real ear measurements. The audiologist who wants to do speech testing should either measure a speech detection threshold (SDT) (14) or use a closed-set test designed for children, such as the Word Intelligibility by Picture Identification Test (WIPI) (15). The WIPI has the advantages of using simple vocabulary and not requiring verbal responses. This lifts the burden from the client of having

to use a foreign language, and prevents the audiologist from misunderstanding the client's response. When interpreting results, it should be remembered that even fluent, but non-native, English speakers tend to perform more poorly on difficult speech tests than native speakers.

Some speech tests available in other languages (Spanish, French, Cantonese, and others) can be obtained from Auditec of St. Louis and the Chinese Medical Journal (16); however, their use entails a knowledge of the foreign language on the part of the audiologist.

When counseling clients who do not speak English, the clinician should remember that they want and need as much explanation of their amplification as anyone else. The audiologist should try to simplify his or her vocabulary while keeping the content of the counseling the same. In parts of the country where there is a large immigrant population, audiologists could translate information sheets into the other commonly spoken language.

CAUTIOUSNESS AND ADAPTABILITY

As medical knowledge and technology have improved, the average lifespan has increased and so has the number of elderly individuals in our society. It is estimated that, of the approximately 24 million Americans over 65 years of age, 65 percent may be affected by hearing impairment (17). Aside from the physiological and mental changes associated with normal aging (18,19) there are behavioral changes too, such as slower learning, less adaptability, and increased cautiousness and conservatism of outlook (20,21). This raises two questions for the audiologist:

1. Is the client responding overcautiously during audiometric assessment and thus giving spuriously poor results?
2. Is the client willing to learn and adapt to using new technology?

Older individuals tend to be more cautious. Clinically, this manifests itself as an unwillingness to respond during pure tone testing and to guess during speech testing. It results in spuriously elevated thresholds (22), and ultimately may lead to the prescription of an unnecessarily powerful hearing instrument. The audiologist must bypass this cautiousness in order to obtain accurate test results. If reinstructing the client does not help, a test procedure should be used that forces the client to respond or 'guess.' In most clinics, this will be most easily achieved

by measuring SRTs and speech discrimination scores with a closed-set test, such as the Modified Rhyme Test (23), the Distinctive Feature Discrimination Test (24), or the Synthetic Sentence Identification test (25). Another option, if computer technology is available, is to compare thresholds obtained conventionally with those obtained using a 2IFC paradigm (26) to obtain a chosen threshold point on the individual's psychometric function (27). As with closed-set testing, a 2IFC procedure forces the client to give a response and thus bypasses their internal criterion or caution to respond.

Data suggest that adults who put off purchasing hearing aids until they are elderly have greater difficulty in adjusting to them than do those fitted while younger (28). This is probably due to the combination of less mental flexibility (29), slower learning (30), and fear of new technology. The client's willingness to use new technology can be assessed by watching his or her reaction to the casual mention of, for instance, a computer, a telephone answering machine, or a microwave. The person who responds "Oh, I leave that new stuff to my wife/husband," is probably more suited to a conventional hearing aid than to a remote-controlled, programmable aid.

When counseling older individuals, extra time should be taken and the clients' understanding of the instructions should be checked. The clients should be asked to demonstrate or to paraphrase what the audiologist has just explained. Also, written materials that can be referred to later should be provided. There are no studies that show the elderly cannot learn (21); they simply learn more slowly than younger individuals.

PHYSICAL STATUS OF THE CLIENT

The individual's physical status should be evaluated as follows:

1. Gross and fine motor skills should be evaluated by the observation of the use of upper limbs, hands, and fingers. Simple evaluation is all that is necessary: observation will probably reveal gross motor capabilities, while fine motor control can be assessed by asking the client to change a battery or to use the on-off switch of a demonstration hearing aid. The clinician should bear in mind that the clinic environment might make an already anxious client more nervous and hence less able to carry out these tasks.
2. The physical condition of the ear should be evaluated by checking for auricular and canal deformities and for evidence of current/recurrent ear infections.
3. The client's (corrected to normal) vision should be evaluated by the use of a Snellen Chart and assessed for how often the client wears his/her eye glasses/contact lenses.

Inserting and controlling a hearing aid requires both gross and fine motor control and thus may influence the style of hearing aid/prosthesis provided. At the extreme is the client with no use of upper limbs, perhaps following stroke or amputation. In the case of bilateral physical disability, there must be a family member or care giver willing to insert and manipulate the hearing aids for the client. Clients with poor gross motor skills may find other assistive listening devices (ALDs), such as a pocket talker or a hand-held amplifier, more convenient than a conventional hearing aid. A programmable hearing aid with a large, easy to manipulate remote for volume control might be another option.

A more commonly encountered situation is that of the individual with poor fine motor control, such as with arthritic hands and fingers, lost sensation in the finger tips, or a Parkinsonian tremor. These individuals probably have the necessary gross motor control for inserting a hearing aid but find manipulating the controls and changing the battery difficult. In these instances, the most practical and least distressing solution would be a hearing aid with large controls and large batteries that have a relatively long life: a BTE or ITE should be suggested. Elderly individuals generally find ITE aids easier to insert than the BTE (31,32,33). Another good option, if the client can afford it, would again be a programmable hearing aid with a remote control. For the individual who cannot manage even larger controls, a hearing aid with a screw volume control fixed by the dispenser is a possibility.

Chronic ear infections will preclude the prescription of ITE styles of hearing aid, since secretions might damage the electronics. BTE fittings with open ear molds are the best solution, as occluding the canal may cause discomfort and can exacerbate the infection, both by interfering with appropriate ventilation and by carrying the infection farther down the canal (34). For more severe losses, in which feedback occurs with an open mold, a vented ear mold may be necessary (35). Most importantly, clients should be counseled on the importance of cleaning the mold carefully and frequently. In extreme

cases of infection, bone conduction aids may be needed.

Chronic infections following hearing aid fitting are most likely to be due to poor hygiene on the part of the client; however, the possibility of an allergic reaction to the ear mold material should not be ruled out. If this seems to be the case, the mold can be remade with a non-allergenic material.

Congenital and trauma-related deformities of the auricle and ear canal may impact upon the style of hearing aid dispensed. A person with no outer ear(s) but with nonimpaired ear canals could have an aid attached to the head in some manner. In cases of completely obstructed or nonexistent canals accompanied by a functioning cochlea, a bone conduction hearing aid can be used, unless a surgical procedure can create or recreate the canal. Bone conduction aids are now available in the form of an implantable magnetic device positioned under the skin in the mastoid area. Implantable devices tend to be preferred over the conventional style, because of their good sound quality and elimination of feedback (36).

Visual acuity can impact upon auditory disability, handicap, and successful hearing aid use in at least three ways:

Lipreading Ability

Much has been written about lipreading and its value for speech discrimination (37–39). In noisy situations, lipreaders can gain between 5 and 22 dB signal-to-noise (S/N) ratio (40,41). These skills are, therefore, particularly important for our clients. Lipreading performance is strongly influenced by visual acuity (42). A person with hearing impairment who requires, but does not wear, eyeglasses should be advised to wear them. The value of lipreading can be demonstrated very simply using a video player and speechreading tape (43). The tape should first be played with vision and sound at a level just audible to the client, and then with the vision removed. People are generally very surprised at how much more easily they can ‘hear’ what is being said when the visual information is present.

Style of Hearing Aid

Clients generally feel that eyeglass frames interfere with the placement of BTE hearing aids, particularly if they take the eyeglasses on and off frequently. ITE styles are therefore preferred, although eyeglass hearing aids, with the aids built into the frames, are another possibility. They have the advantage of combining two prostheses into one instrument, but require thicker and heavier

frames than usual in order to house the aid, and, of course, removing them removes the hearing aid, too. With the increased availability of ITE and ITC aids, eyeglass aids are less popular.

Hearing Aid Use and Upkeep

Poor visual acuity can make locating and reading the hearing aid switch difficult. Therefore, persons with visual impairment may need more training than average on hearing aid use. They should be given extra advice on inserting the battery correctly, such as being told to insert it before removing the tab or being taught how to distinguish the positive versus and negative sides by touch. It should be emphasized that the hearing aids must be cleaned regularly, in order to prevent blockages from wax that the wearer may not be able to see. Clients unable to see well enough to clean the hearing aids themselves should ask a family member to help, or the audiologist should be available to clean the hearing aids in the clinic.

Unfortunately, despite recommendations, clients often insist on choosing an impractical hearing aid. The audiologist is then faced with a dilemma: insisting upon the practical solution may result in rejection of the aid, while allowing the client to choose the less practical solution may lead to frustration, and consequently, rejection of the aid. The only solution is for the audiologist to counsel the client with the aim of reaching a compromise. Failing this, the audiologist should follow the client’s progress with the chosen aid, giving as many helpful suggestions as possible.

PREVIOUS REHABILITATION EXPERIENCES

The audiologist must learn what previous rehabilitation clients have undergone and how they felt about their experiences, asking them about their previous use of, and experiences, with:

- hearing aids and ALDs
- rehabilitation classes (e.g., lipreading, self-help groups)
- counseling and information they have received about their impairment
- what benefits and problems they have encountered with each.

In this way repetition of previous mistakes can be avoided. The audiologist should try to build on the posi-

tive aspects of past rehabilitation and avoid those aspects that were unsuccessful (34).

OCCUPATIONAL STATUS

The audiologist should determine whether:

1. the individual is working, retired, or unemployed and seeking work,
2. if working, the client's occupation imposes any specific demands upon hearing or whether any aspects of the job will complicate hearing aid fitting.

Working clients will probably be younger than the average person with hearing impairment, and, therefore, more likely to perceive hearing loss to be handicapping (44–46). Hence, their expectations from aural rehabilitation may be higher and harder to meet. On the other hand, younger individuals can generally adapt more easily to wearing hearing aids (28) and may, therefore, be easier to rehabilitate than older ones.

Every profession requires a degree of hearing ability; specific requirements, of course, differ. The audiologist should discuss clients' particular work environments, their needs, and their difficulties. In most instances, the audiologist should be able to suggest some practical solutions of which they might have been unaware. Once they have discussed their difficulties and the solutions with their audiologist, they can then confidently approach their employers. Clients are often surprised at how a positive, open approach is met with understanding and help. Persons who try to hide their hearing loss are likely only to appear incompetent.

A very common problem faced by working professionals is telephone use. While BTE and ITE hearing aids can have built-in telephone switches, ITC and CIC aids are too small to house the extra circuitry. BTE hearing aids, however, require the telephone receiver to be held behind the ear, not over the ear, and thus are not favored for frequent telephone use. Clients often report that the telephone switch is not sufficiently powerful, in which case a telephone amplifier is one solution for the professional who uses the same telephone set all the time. A t-coil with a preamplifier or a portable amplifier that fits any headset is another option. It should be noted that computer noise is picked up by the t-coil and that this should be considered when positioning computers and telephones.

For some interactions, ALDs can be used in conjunction with, or instead of, a hearing aid. For instance, a

portable microphone could be placed on an employee's desk, at the supermarket checkout, or on the post office counter to amplify voices; while an FM system can be used in a classroom, courtroom, or corporate boardroom.

Some professions make very specific demands upon the auditory system and may require specialized equipment. For instance, amplified stethoscopes are available for physicians and nurses, and amplified two-way radios can be installed in police patrol cars. Musicians with hearing impairment will undoubtedly feel extremely handicapped. Their best option would probably be high-fidelity programmable hearing aids with a wide-band receiver and sophisticated compression to restore normal loudness growth.

Occupations in adverse environmental conditions put an added burden on selecting appropriate amplification. Such clients must be counseled not to wear hearing aids while in the vicinity of loud noise and to wear hearing protection in order to prevent further hearing loss. Rubber casings (Superseals) that can be worn over BTE hearing aids are useful in very damp or dusty environments.

Individuals seeking a job will require careful counseling, especially if they became unemployed against their will. They may have a poor self-image, low self-esteem, and a feeling of being disadvantaged by having to cope with a hearing impairment while seeking a job. They may also fear discrimination by potential employers. Such clients should be counseled firmly about the advantages of obtaining hearing aids and reminded that the Americans with Disabilities Act of 1990 (47,48) was brought into being specifically to prevent discrimination.

THE AMERICANS WITH DISABILITIES ACT

Audiologists should be aware of the Americans with Disabilities Act (ADA) that became law in 1990 to prohibit discrimination against persons with disabilities. It must be adhered to by state and local governments as well as by private employers with 15 or more employees. In brief, it states that employers must not discriminate against a qualified individual with a disability and must make reasonable accommodations for this individual in the workplace, ensuring that he or she is not excluded from participating in any services, programs, or activities. For the individual with hearing impairment, it means that employers must consider providing signaling devices, telephone amplifiers, and text telephones. All government-owned departments, buildings, public services,

and transportation services must provide visual alarms, amplified phones, ALDs (not hearing aids), and text telephones in phone banks. Theaters with 50 or more seats must have listening devices, usually in the form of an infrared system, for at least 4 percent of their capacity, and hotels must equip at least one room with visual alarms and amplified/text telephones. By informing clients of their rights and describing some of the devices that may be available in public places, audiologists will be doing them a major service. Copies of a summary similar to the above could be placed in the waiting room or given out along with other informational literature. The audiologist should also keep a copy of the full ADA to reference when needed.

LIFESTYLE

People have different amplification requirements depending upon their lifestyles. At the one extreme is the person who lives alone, spending most of his or her time watching television. At the other is the person who lives with a family, participates in community and social events, and has a variety of pastimes. It is the role of the audiologist to determine what types of amplification will best suit his or her clients by assessing their needs and lifestyles. Information should be obtained about:

- main daily activity(ies)
- hobbies that might impact upon amplification and counseling
- situation(s) in which the client most wants to hear.

For the individual who has few interpersonal interactions, ALDs may be the preferred solution (49). A person could, for instance, be provided with an infrared system for the television and amplifiers for the telephone and doorbell. These ALDs are all relatively inexpensive and less likely to get lost or broken than is a hearing aid.

Once the audiologist knows which listening situations are especially important to the clients, their needs can usually be met. For instance, a person who frequently attends night classes could have an FM system, the avid football player could have aids built into his helmet, and a bird watcher or concertgoer could have a multiple memory programmable aid in which one program has more high-frequency gain than would be prescribed for everyday listening. Some hobbies may preclude the use of certain styles of hearing aid; for instance, BTEs would not be appropriate for most kinds of physical exercise.

Even though hearing aids incorporate forms of output limiting (peak clipping, compression), the client must be warned not to wear them while engaged in very noisy activities, such as hunting, lawn-mowing, attending rock concerts, and using power tools. Explain that if a hearing aid further amplifies an already loud sound, further noise-induced hearing loss can occur. Clients must be reminded that hearing aids are fragile electronic devices that require careful looking after. New users, in particular, are often unaware of this. Inform them not to use hearing aids when they might get wet (showering, swimming, sailing) and not to attempt to dry them out in the oven if they do (a surprisingly common error!). Similarly, hearing aids will ‘melt’ if left in the sun on a car dash board, will get crushed if chewed on by a pet, and lost if carried in a pocket rather than worn. These warnings may seem somewhat comical and facetious, but most audiologists have come across at least one of these horror stories.

Hearing aids unfortunately suffer ‘bad press’ from many users. Therefore, audiologists should ask their satisfied clients to tell others about the advantages of wearing a hearing aid. As we know from Ronald Reagan and Heather Whitestone (former Miss America), a role model in the community can substantially change the general awareness and perception of hearing aids.

MOTIVATION

Persons with hearing impairment must be motivated to acquire and use hearing aids if the rehabilitation process is to be successful. It is up to the audiologist to provide this motivation if it is lacking in the client. Unfortunately, studies show that a lack of motivation is all too common (50) and that individuals who would benefit from hearing aids frequently do not acquire them. Kochkin (51) found the reasons most commonly put forward are:

- Current state of hearing loss: loss not severe, can cope without an aid
- Affordability of hearing aids: too expensive, have other priorities
- Stigma: admit loss in public, embarrassment
- Healthcare professional recommendation: influenced not to purchase aid, did not trust healthcare professional.

By the time the audiologist sees the client, some degree of motivation must be present, whether the motiva-

tion to get help or the motivation to satisfy a nagging spouse. The motivation should be determined early in the visit by the clinician asking two simple questions:

1. What prompted you to come for a hearing test?
 - (a) *Difficulties with hearing*
 - (b) *My family/friends*
2. What do you expect to gain from this visit?
 - (a) *Proof that hearing is normal*
 - (b) *A hearing aid*
 - (c) *Help for my hearing, but not a hearing aid*

When clients answer question 2 with 'a,' the audiologist's first task will be to help them accept that they have a hearing loss. Poorly motivated clients who accept their hearing loss, (responses 'b; to question 1 or 'c' to question 2) need motivational counseling. First, it should be determined *why the client is reluctant to acquire a hearing aid*, and then *what, ideally, the client wants from a hearing aid*. A structured interview (see Appendix 1) will enable the audiologist to obtain this information efficiently. Following this, the client's negative feelings should be discussed and the potential benefits of amplification should be pointed out. It is important that reference be made to the client's personal needs, since presumably, counseling is most effective when tailored specifically to the individual (52).

EXPECTATION

The auditory system functions via a series of mechanical and electrical processes so complex that, unfortunately, current hearing aids are unable to restore hearing to 'normal.' Potential users often arrive at the clinic with one of two assumptions: either that hearing aids, like eyeglasses and contact lenses, will restore hearing to normal or that, according to complaints of friends, hearing aids will provide no benefit at all. Expectations prior to obtaining a hearing aid do influence final satisfaction (9,53-55). Therefore, prior to beginning rehabilitation, the client's expectations should be determined. Two simple questions can reveal the necessary information:

1. How do you think you ought to hear with hearing aids?
 - (a) *Without any difficulty*
 - (b) *Quite well after getting used to them*
 - (c) *Not much better than before*
2. How long do you think it will take to get used to a hearing aid?

- (a) *A day or two*
- (b) *A few weeks*
- (c) *A very long time*

Clients who answer 'a' for one or both questions have unrealistically high expectations. Hence, they will be disappointed, and may even reject amplification outright, if some of the limitations of hearing aids are not discussed in advance of fitting. On the other hand, the client who responds 'c' to both questions has such low expectations that he or she might opt out of rehabilitation before there has been a chance to derive benefit. It is up to the audiologist to modify expectations prior to fitting by providing the client with information about the benefits and limitations of hearing aids, and pointing out that it sometimes takes several months to obtain maximum benefit from them.

ATTITUDE

Client attitudes toward owning and wearing hearing aids range from being very positive ('give me whichever aid will help me hear best') to being completely negative ('hearing aids are for the elderly, I do not need one and will not wear one'). It is not surprising then, that research has shown the importance of client attitude upon unaided handicap and disability (9,56), upon reported benefit from a hearing aid (9), and upon hearing aid use (57).

Client attitudes should be evaluated before beginning rehabilitation, either by informal questioning during the case history or with a formal Attitude Questionnaire (See Appendix 2).

Using informal questioning, Goldstein and Stephens (13) defined four types of clients based upon the individual's attitude to rehabilitation:

Type I individuals have a highly positive attitude to rehabilitation and hearing aids, and no additional factors complicating the rehabilitative process.

Type II individuals have an essentially positive attitude to rehabilitation, but rehabilitation is complicated by a factor, such as a 'difficult-to-fit' hearing loss, a prior negative rehabilitation experience, or occupational and social factors that make a simple fitting solution impossible.

Type III individuals have a basically negative attitude to rehabilitation, but will probably cooperate with the chosen management program. Often the basis of their negative attitude can be determined, and hence there is

hope for modification. They suggest that these persons require a change in attitude before a hearing aid is fitted or the process will be doomed to failure.

Type IV individuals reject all forms of rehabilitation outright and may be impossible to treat successfully.

Categorizing a client into attitude type may be complicated by the client's etiquette regarding politeness. For example, Van Campen and Goldstein reported the case history of a woman who was classified as Type II because she showed a great willingness to try hearing aids with a difficult-to-fit audiometric configuration. However, she constantly complained about her aids. Reclassified as Type III, she was given a course of communication training and counseling and became a satisfied full-time hearing aid user (59). This highlights how the audiologist must always be alert to the unspoken messages in a client's conversation, reports, and complaints.

Using a formal "Attitude Questionnaire," originally developed by Brooks (57) and amended by Saunders and Cienkowski (56), scores on five attitude subscales can be determined:

1. Social and Emotional Impact of the Hearing Loss
2. Lack of Acceptance and Adjustment to Hearing Loss
3. Perceived Absence of Support from Significant Others
4. Hearing Aid Stigma
5. Awareness of Hearing Loss.

The questionnaire, reprinted in Appendix 2, takes only about 10 minutes to complete and 2 minutes to score. It provides a profile of subjects, which can then be used to understand the client's reported handicap and disability and can be used very effectively in counseling.

Social and Emotional Impact Of Hearing Loss

The more hearing impairment impacts upon individuals socially and emotionally, the more handicap and disability they report, regardless of their actual degree of hearing loss. Therefore, the audiologist should take the time to provide advice on mechanisms for coping in social situations. New hearing aid users often are aware of only a few listening strategies or hearing tactics (60), but more importantly they do benefit from appropriate instruction (61–63). Booklets on hearing tactics are often provided by hearing aid manufacturers and should be given to the client and discussed at the time of fitting.

Lack of Acceptance and Adjustment To Hearing Loss

A major step in rehabilitation is for the client to accept the disability and adjust to its consequences. Until the disability is accepted, adjustment cannot begin to take place; until the client has accepted the need for assistance, it is unlikely that any type of rehabilitation will be successful (64).

A lack of acceptance commonly stems from three sources:

1. a hearing loss that has occurred slowly over many years. Thus, the day-to-day changes in communication ability are minimal and often attributed to the environment, other people, and even society (65).
2. anger about the origin of the hearing loss. This is common if the hearing loss was of sudden onset, occurred through occupational exposure to noise, or was made worse following unsuccessful middle ear surgery (65).
3. the association between hearing loss and aging, and the stigma associated with aging. Clients who associate hearing loss with aging must accept that they are getting older in order to accept their hearing loss. In our society, both have negative associations.

The first step toward acceptance is understanding. Thus, clients should be educated about hearing and hearing impairment. Hodgson recommends that at least four issues be explained (66):

1. *The severity of the loss.* If the loss has been acquired over many years, clients will probably be unaware of just how poor their hearing has become. The audiologist should demonstrate their hearing loss to them by playing some speech material at a comfortable listening level for a person with unimpaired hearing (about 70 dB SPL) and then raise the volume to their comfortable listening level. The client needs to appreciate the existence of the impairment before he or she can accept and adjust to it.
2. *The difference between speech detection and speech discrimination* (i.e., hearing vs. understanding) and how they relate to hearing impairment. Unless clients are aware that one feature of sensorineural impairment is poor speech discrimination, they may continue to reject the notion that they have a hearing loss and accuse others of mumbling.
3. *How a healthy ear should function and how the client's ear is functioning.* The clinician should talk

not only about diagnosis but prognosis. If the client has a sensorineural loss he or she must understand that it is, at present, medically irreversible.

4. *Some of the other features of hearing loss about which the client may be unaware should be discussed.* For instance, there should be an explanation of the effects of recruitment and why, due to his or her audiometric configuration, the client may hear some speech sounds but miss out on others. A simple diagram, such as that in Appendix 3, is a useful tool for explaining this.

Once clients have accepted that they have a hearing impairment, they can begin to adjust to it and will, hopefully, become motivated to acquire a hearing aid.

Perceived Absence of Support From Significant Others

Hearing impairment has consequences not only for the sufferers but for everyone with whom they interact, in particular, their immediate families. Significant others who react inappropriately to their reduced abilities are often a further source of handicap (67,68). While relationships do not usually break down because of hearing loss, tension and frustration are increased, and communication becomes less intimate (69,70). Clients who feel their families are unsupportive report feelings of frustration, isolation, anger, and resentment, to name but a few; similar feelings, however, are also reported by the unimpaired partners (69,71). Successful rehabilitation should, therefore, involve both clients and spouses, especially as changes in attitudes and behaviors are more likely to be adopted and maintained when both partners are involved in the process (67).

Counseling sessions that both partners attend should be arranged, during which the audiologist must act as both a teacher and a mediator so that the feelings and needs of both partners can be expressed. Since audiologists are not specifically trained in these skills, the process may be easier if a structured interview or questionnaire is used, as opposed to open-ended discussion. Various questionnaires, interviews, and diaries have been designed (72–74). Often, once needs and feelings of resentment are voiced openly in a safe environment, emotional charges drop and resolution can begin (69). A second successful approach is group counseling, sessions attended by more than one couple (67). These are useful for at least two reasons: first, clients find that their problems are not unique, and second, clients can gain insight

into the coping strategies of others, and may even put those strategies into practice.

Hearing Aid Stigma

Stigma associated with hearing aids has time and again been shown to be a major factor in hearing aid rejection (31,75,76). Hearing aids are associated with stupidity and old age (31,76,77), and clients themselves report feeling older when wearing them (31). It is perhaps not surprising, then, to find that many clients plan to purchase CIC or ITC aids over BTEs and ITEs based solely on cosmetic appeal (76). More strikingly, many individuals who had been given a free BTE aid by a National Health Service were willing, for cosmetic reasons, to buy ITEs (31,78).

The issue of stigma is, therefore, often a major stumbling block in the clinic. The individual who associates hearing aids with negative connotations usually wants an 'invisible' one. If the client has a mild-to-moderate loss and is manually dexterous, a small, less visible aid is a reasonable choice. On the other hand, for those clients with moderate-to-severe losses (or greater), and those who realistically cannot handle a small hearing aid, a larger model is audiometrically and practically more suitable. Educating the latter individual as to why a large hearing aid is most appropriate is probably the best approach. Explain that, although cosmetically less appealing, a larger aid has the following advantages:

1. stronger mechanical parts (face-plate, battery door and battery contacts),
2. bigger batteries that last longer,
3. larger amplifier chips with room for additional circuits that provide more gain, greater bandwidth, and less distortion, and
4. more room for extra adjustment trimpots (79).

However, if this approach is unsuccessful, a compromise must be reached. I am of the opinion that a firm stance by the audiologist is important and that it will lead to a compromise in the 'right' direction. The audiologist should then provide as much support and follow-up as seems to be required.

Awareness of Hearing Loss

A high 'awareness of hearing loss' score is in part a reflection of poorer audiometric thresholds, but is also associated with a more anxious personality type (56). Thus, if a client has higher scores than would be expected from

his or her hearing loss, counseling aimed at lessening social anxiety would be most useful. Such counseling should consist of highly practical suggestions for coping with specific situations that the individual finds most stressful.

CLIENT EDUCATION

The question of client education is not how educated is the client but how best can the client be educated. Education is needed, since utilizing hearing aids to their best advantage requires knowledge, time, and effort. The audiologist must provide this knowledge and motivate the client to learn to use the aids well. Audiologists now have a variety of tools available for teaching and counseling:

- one-to-one and group discussion
- video tapes
- provision of reading materials
- interactive computer programs and video disks.

Before beginning counseling, the audiologist should try to determine

1. how best the client will learn,
2. how motivated the client is to learn, and
3. how sophisticated and detailed the educational material should be.

There are evaluation materials available for determining learning styles. They suggest a blueprint as to how each type of individual will best learn (80,81). For clinical purposes, less formal evaluation is sufficient. Consider the following:

1. The level of education and/or occupation of clients should, in part, determine the sophistication of counseling.
2. The interest of clients in the test procedures and results probably reflects their interest in learning about their disability and should, in part, determine the detail in which findings are explained.
3. The expressions and body language of clients will give important clues as to how well they are understanding the counseling.
4. The time constraints of the clients should be an indication as to how long counseling sessions should last.

ECOLOGY OF THE ENVIRONMENT

The ecology of the listening environment is all-important for audiological rehabilitation (82). Unfortunately for the person with hearing impairment, the world is not a friendly place in terms of architectural design and current social practices. Most shopping malls, places of worship, post offices, restaurants, and supermarkets have hard, highly reflective walls and floors, play over-loud background music, use poor lighting, and have noisy air conditioning systems. The effect of these upon hearing aid use is highly detrimental. Clients need to be told how reverberation and interfering noise will impact upon their ability to hear with an aid and be given suggestions for coping.

Unfortunately, the environment outside the home (and perhaps work), is relatively unchangeable. The ecology of home and work environments, however, can often be improved. The audiologist should take time to learn about the client's home and work and provide advice for overcoming difficulties. The following questions should be asked about the home and, if applicable, the work environments:

1. *In which room(s) does the client spend most time?*
2. *What furnishings are present in each (floor surface, plush or hard seats, window and wall coverings)?*
3. *What extraneous noise sources are present in each (open windows near busy streets, air conditioning units, music system speakers, computers, and so forth)?*
4. *Where does the client usually sit in relation to: extraneous noise sources, family members, television, music?*

The audiologist can then provide suggestions for improving the situation, for instance:

- use rugs to cover bare floors, put throw cushions on wooden furniture, and hang heavy drapes
- turn off music if it is not specifically being listened to
- do not sit near extraneous noise sources, or remove the noise sources completely (turn off air conditioners, computer, close windows)
- Ask others not to sit with a window behind them (to make their face more visible for lipreading)
- use good lighting to enhance lipreading capabilities
- sit facing those individuals with whom most interaction takes place.

New hearing aid users often say that a positive feature of hearing impairment is the absence of extraneous noise. They are usually horrified at just how much noise they can hear when first given a hearing aid. The audiologist must point out that persons whose hearing is not impaired also hear this noise, but have learned to ignore it and that the client will have to relearn this skill.

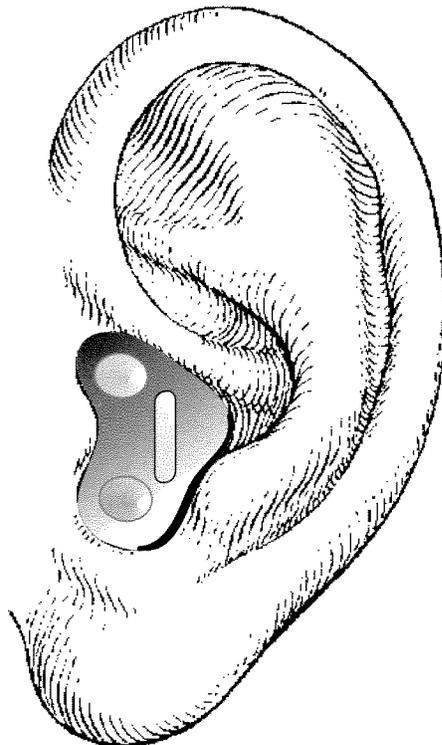
CULTURAL CONSIDERATIONS

The American population consists of a vast diversity of cultural backgrounds, each of which has its own customs, beliefs, and behaviors. Audiologists may encounter beliefs and ideas foreign to their way of thinking. These ideas should be acknowledged and respected if rehabilitation is to succeed. For instance, a general Asian belief is that aging is a natural process that does not require intervention. Young Asians show respect for older individuals with hearing impairment by speaking loudly or nodding, even if the older person cannot really follow

the conversation. Thus, many Asians do not feel the need for aural rehabilitation (83). Audiologists will have to do their best to work around such beliefs.

PROS AND CONS OF SELECTION CHOICE

Fourteen “other evaluative procedures” have been discussed above. Probably most audiologists already consider many of these issues when fitting amplification and counseling, but not necessarily in so formal a manner. The minimal extra clinic time these evaluations require seems a small price to pay for the additional benefits the client will receive: a practical prosthesis based upon an accurate initial assessment of his or her physical abilities and personal needs. Clients who feel they are receiving personal attention and a rehabilitation program tailored specifically to them will have a positive attitude to rehabilitation and hearing aids and thus will experience a more successful and easier rehabilitative process.



APPENDIX 1

Throughout this chapter, I suggest using a 'structured' interview to obtain information efficiently. A structured interview consists of questions, each of which has a list of options from which the client chooses a response. Rather than its being completed as a questionnaire, it is read by the audiologist. It is often helpful to clients if they also have a copy of the interview. The advantage of a structured interview is that very specific information can be obtained quickly, while clients can still elaborate upon any point they wish.

When designing a structured interview, it is important that the response options be as comprehensive as is feasible; in particular, they must always allow the client a 'null' response. For example, if the audiologist were determining the situations in which the client felt he or she would benefit from a hearing aid, the following question could be asked:

In what situations would you like to hear better?

(a) While watching television with my family:	YES	NO	Not Applicable
(b) At mealtimes with my family:	YES	NO	Not Applicable
(c) At the movies:	YES	NO	Not Applicable
(d) I hear perfectly well in all situations:	YES	NO	Not Applicable

The above allows for two types of null response; choice 'd' lets clients respond that they do not feel they will benefit from a hearing aid at all, and the 'not applicable' option lets them point out situations they never come across. Had the latter been omitted, the audiologist might interpret the responses as suggesting the client is denying a hearing loss. Incidentally, the 'not applicable' responses also provide important information about client lifestyles.

APPENDIX 2

Attitude Questionnaire

1. Does the thought of wearing hearing aids make you feel older?	YES	NO
2. Do you go out as often as you used to before becoming hearing impaired?	YES	NO
3. Does your poor hearing make you feel inadequate?	YES	NO
4. Are you concerned about being seen wearing hearing aids?	YES	NO
5. Are you pleased at the thought of getting hearing aids?	YES	NO
6. Do your friends and family get angry because of your hearing difficulties?	YES	NO
7. Have other peoples' comments made you unhappy about wearing hearing aids?	YES	NO
8. Do others associate hearing aids with stupidity?	YES	NO
9. Do you feel hurt if people comment about your hearing?	YES	NO
10. Do you think you are constantly ignored because of your hearing difficulty?	YES	NO
11. Are you as self-confident as you were when your hearing was normal?	YES	NO
12. Do you think as quickly as you used to before becoming hearing impaired?	YES	NO
13. Do you get into arguments about the loudness of the television?	YES	NO
14. Do your family and friends frequently tell you to listen harder?	YES	NO
15. Do you think your family and friends find it a strain to talk to you?	YES	NO

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16. Do you mix less with other people (not family) because of your hearing loss?	YES	NO
17. Do you avoid small talk because of your hearing difficulty?	YES	NO
18. Do you dread meeting new people since becoming hard of hearing?	YES	NO
19. Are you as outgoing and talkative as you were before becoming hearing impaired?	YES	NO
20. If you are in a situation where several people are chatting, do you often give up trying to follow the conversation?	YES	NO
21. In a conversation, do you keep quiet for fear of saying the wrong thing?	YES	NO
22. Are your family and friends understanding about your hearing problems?	YES	NO
23. Do you feel you are missing out on some sounds (e.g., the birds, rain)?	YES	NO
24. Which best describes your hearing loss:		
(a) not a serious problem		
(b) a difficulty that can be overcome		
(c) a burden?		

Subscales:

1. Social and Emotional Impact of Hearing Loss: Questions 2, 3, 11, 12, 16, 17, 18, 19, 20, 21.
2. Lack of Acceptance and Adjustment to Hearing Loss: Questions 5, 8, 10, 16, 18, 22.
3. Perceived Support from Significant Others: Questions 6, 13, 14, 15.
4. Hearing Aid Stigma: Questions 1, 4, 7, 9.
5. Awareness of Hearing Loss: Questions 3, 21, 23, 24.

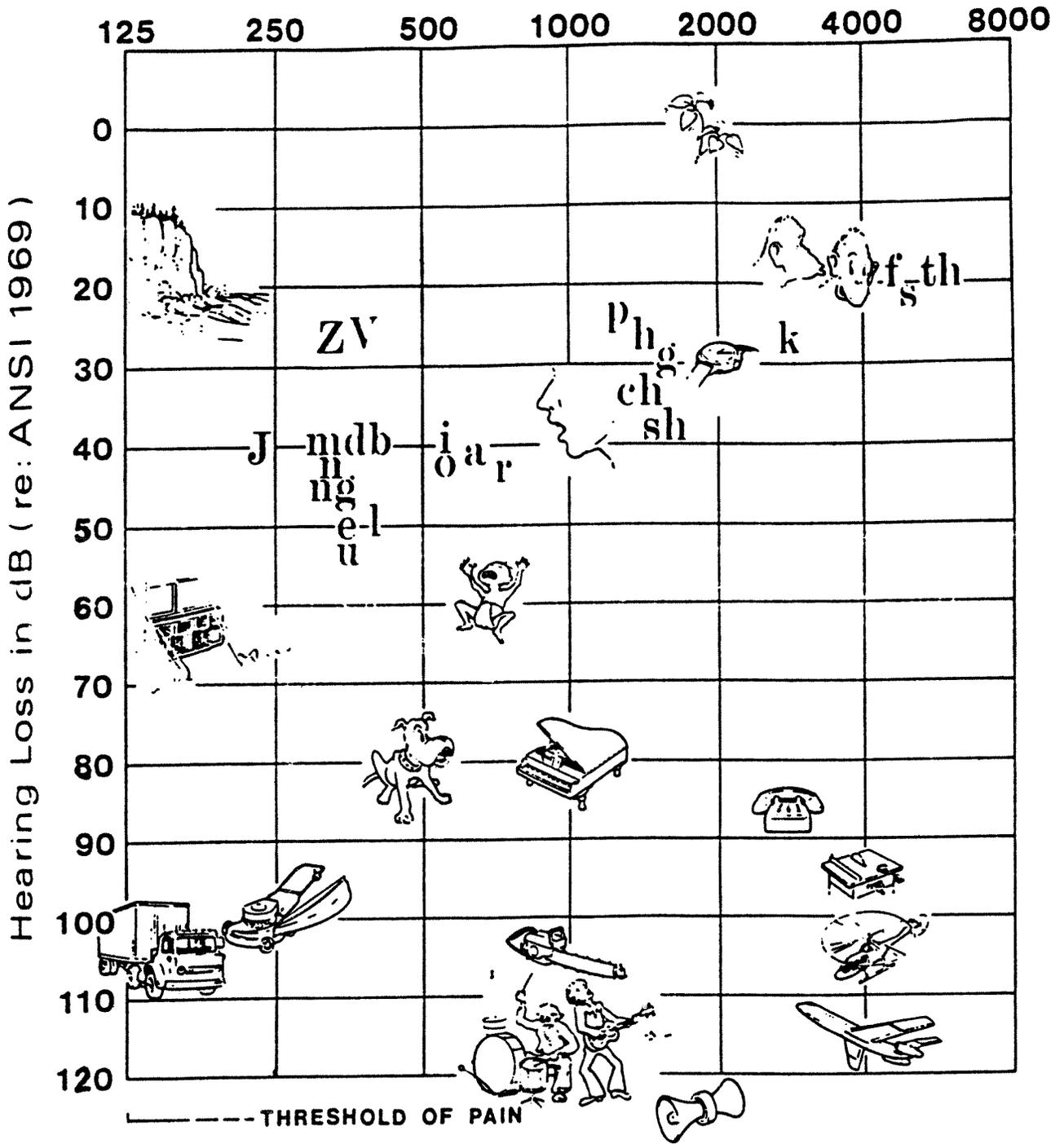
Scoring:

Add up the points obtained on each subscale. For example, question 1 is on subscale 4 (Hearing Aid Stigma), a YES response on question 1 is worth 2 points, a NO response is worth 0 points.

Question	Response		Question	Response		a=1	b=2	c=3
	YES	NO		YES	NO			
1	2	0	13	2	0			
2	0	2	14	2	0			
3	1	0	15	1	0			
4	2	0	16	1	0			
5	0	2	17	1	0			
6	2	0	18	1	0			
7	1	0	19	0	2			
8	2	0	20	1	0			
9	1	0	21	1	0			
10	2	0	22	0	2			
11	0	2	23	2	0			
12	0	2	24	2	0			

APPENDIX 3

Explanation of Audiogram and Effect of Hearing Loss



Audiogram.

This diagram can be used during counseling to explain to clients why they are able to hear some sounds but not others. (Reprinted with permission from JL Northern and MP Downs. Hearing in Children. 4th ed. Baltimore: Williams & Wilkins; 1991. p.17.)

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