

Hearing Instruments: A Psychologic and Behavioral Perspective

It is our view that hearing instrument acceptance and wearer success does not pivot on the complex interaction between hearing loss and electroacoustics.¹ The hearing aid literature seems to imply that there is a missing link in the equation. This missing element may relate to wearer behavior, or in a global sense, his/her psychological profile. Even though issues related to behavior have been accepted as axiomatic, our literature has done little to explore this subject in either a theoretic or prac-

The Process of Behavioral Change and the Transtheoretical Approach

Acceptance and use of hearing instruments is a type of behavior change. James Prochaska and his colleagues at the Univ. of Rhode Island have developed a model of behavior change which may be relevant to the understanding of aural rehabilitation and amplification. Their model is based on reduction of behaviors that contribute to health problems, such as smoking and alcohol abuse.⁴

The model presents the process of change as a progression through six stages. Furthermore, Prochaska and colleagues have designed a therapy program, the transtheoretical approach, with techniques that are specific to each stage.^{2,5} We are struck by a similarity to the stages of this model for changing behavior to the process of successful hearing instrument use. The progression of stages is: precontemplative, contemplative, preparation, action, maintenance and termination. A change is not complete until termination is reached, and many individuals relapse to an earlier stage. Each stage will be described, and suggestions for management at each stage will be discussed. These suggestions are based loosely on facets of the transtheoretical approach.⁵

The *precontemplative* stage

implies that the individual has not yet accepted that there is a problem. Therefore, they have no interest in changing. This stage is well known in the case of a person with impaired hearing who comes to the clinic because someone else, typically a loved one, has sent them. They do not have any intention of changing at this time, and if an attempt to force them to change is made at this stage, it is unlikely to succeed. This doesn't mean that an effort cannot be made to help move them to the next stage. One approach that could be useful at this stage is "consciousness-raising," or trying to make the person more aware of the actual problem. Just pointing out the numbers on the audiogram is probably not enough, but a questionnaire about communication situations in the individual's life, plus discussion of the answers may go a long way toward progress.

In the *contemplation* stage, the person has become aware of the problem and is investigating, or at least considering, ways to change. This could mean investigating hearing instrument purchase in some way, such as by price shopping, or interviewing friends or professionals. There is not yet a commitment to change, just recognition

By Jay Singer, PhD, James Healey, MS, & John Preece, PhD

This article focuses on three major concepts: hearing instrument acceptance as a form of behavioral change, the influence of explanatory style on wearer success or failure, and the practical elements of managing post-fitting wearer behavior. Behavioral change is discussed in terms of a transtheoretical approach, including the stages of change and its promotion. Explanatory style is related to a learned helplessness model and may account for the negative or defeated attitude common to some individuals who do not adapt to hearing instruments. The Hearing Functioning Profile allows practitioners to methodically monitor and manage wearer post-fitting behavior.

tical manner. This article attempts to address both issues.

Two theories may explain when an individual is ready to engage in the hearing instrument fitting process and what behavioral trait may account for failure or success. Behavioral change and readiness are discussed in terms of a therapeutic strategy, the transtheoretical approach.² Success and failure are tied to a "learned helplessness" model.³ We believe these concepts hold promise for understanding why hearing instrument wearers have positive or negative experience and, ultimately, how we can affect the outcome.

The second part of this review addresses an aspect of behavior related to a wearer's interaction with his/her environment. We believe hearing instrument wearers must have an early recognition of difficult environments and well developed strategies to manage them. This practical discussion should provide readers with tools related to both.

Jay Singer, PhD, and John Preece, PhD, are associate professors in the Department of Communicative Disorders at the Univ. of Rhode Island, Kingston. James Healey, MS, is the president of Audiology Rehabilitative Services, Ltd., Warwick, Rhode Island.

that change would be beneficial. Some people remain at this stage for a very long time or even return to the precontemplation stage. Probably the simplest, but most important, interaction at this stage is the provision of correct information in regard to expectations, costs and related issues. Group sessions in which the hearing-impaired person can meet others in the "same boat" are very helpful.

An often overlooked stage is *preparation*. The person in this stage is just about to take action on his/her problem. A date may be set, perhaps by making an appointment with a hearing care professional. Unfortunately, the individual still may be ambivalent about the action. Prochaska et al.⁴ note that progressing through the preparation stage too quickly reduces the chances for lasting success. Commitment needs to be reinforced at this time, perhaps by signing the client up for rehabilitation sessions following the hearing instrument purchase.

A modification of behavior marks the *action* stage. This would be the actual purchase of hearing aids. It is important to realize that action is not real change. It is quite common for a person to take action, but then return to an earlier stage—contemplation or even precontemplation. Far too many people have obtained hearing instruments and quickly stop using them, either through a return or by simple non-use. One of our biggest issues as hearing professionals is to bring the new hearing instrument user into the next stage. It is important at this stage to make the new hearing instrument user aware of the benefits. Situations of successful communication that were difficult or impossible before should be arranged and aided improvement demonstrated.

The *maintenance* stage is necessary to prevent relapse. It is during this time that the actual gain of the action is realized. This stage probably requires the most support of all of the stages. For our purposes, maintenance is marked as the time during which the user becomes truly aware of the benefits of the hearing instruments. This can only happen through use, and quite often through specific support services and training. This may be the ideal stage in which to emphasize aural rehabilitation information. The user must be assured that at least some aspect of life has been improved by his/her action. Maintenance may be a very long stage.

When termination is reached, the possibility of relapse (i.e., non-use) is remote. This is the goal. The individual has accepted the hearing instruments as a necessary part of life. Until this stage is reached, it cannot be said that change has truly taken place.

Success and Failure Related to the Learned Helplessness Model

If developing the readiness for change is achievable, why then do some people fail? Some individuals view circumstances as beyond their control. They may perceive an inability to control or influence certain events. Unsuccessful hearing instrument wearers may be a part of this group.

It is well documented in the psychology literature that when people experience uncontrollable negative events they may incur cognitive, motivational and emotional deficits.^{6,7} This phenomenon is known as "learned helplessness." We hypothesize that sensorineural hearing loss may be viewed as an uncontrollable negative event. In fact, there are many articles alluding to psychological deficit as an important factor relating to hearing instrument rejection.^{8,9,10,11}

To envision how learned helplessness may bear on hearing instrument wearer experience, it is first necessary to under-

stand the basic theory and underlying mechanisms. Learned helplessness is a giving-up response, a quitting reaction that follows from the belief that whatever is done does not matter. A modulator of this response is explanatory style, the manner in which we habitually explain to ourselves why events happen. A pessimistic explanatory style produces helplessness, whereas an optimistic style produces an energized positive affect. When individuals face negative uncontrollable events, they ask why this has occurred. How the question "Why?" is answered may determine the ability to adapt to the event. Abrahamson et al.³ indicate there are three relevant explanatory dimensions.

The first aspect is the locus of *causal explanation*. Is the event attributable to an individual (internal explanation) or to someone or something else (external explanation)? The second aspect is *stability*. Will the cause persist (a stable explanation) or be transient (unstable explanation)? The third factor is *globality*. Will the cause affect several outcomes (global explanation) or be limited to a single event (specific explanation)? The central prediction of this theory is that individuals with an explanatory style that identifies internal, stable and global causes for negative events will have a helpless response and a pessimistic or depressed affect. Optimists have explanatory styles opposite from pessimists. Psychologists interested in human adaptation have used learned helplessness theory to account for failures and successes of human action.^{12,13} It is possible that hearing loss and the ability to adapt to hearing instruments can be explained by learned helplessness theory and explanatory style.

A number of authors have stated that attitude and motivation are pivotal beyond all other factors regarding the willingness to pursue hearing instruments and ultimately succeed with them.^{8,14,15} Some have tried to measure these behaviors by using questionnaires.^{9,16,17} These studies strongly affirmed the importance of psychological factors and should serve as a beginning step as we attempt to understand the behaviors that relate to positive and negative hearing instrument experiences. Unfortunately, these studies and questionnaires do not assess the underlying behavior that may account for attitude and motivation regarding hearing instruments. In addition, the scales used generally lack psychometric validation.

Fortunately, the groundwork for moving ahead effectively has already been developed by psychologists. The Attributional Style Questionnaire (ASQ)¹⁵ is a self-report instrument designed to measure explanatory style related to good and bad events with internal-versus-external, stable-versus-unstable and global-versus-specific causes. The ASQ has received rigorous psychometric validation. Evidence indicates that this scale can be applied to research on achievement motivation, self-esteem and responses to aversive life events.¹⁹

By developing an understanding of an individual's relevant psychologic profile, it seems likely that we could identify high risk (for failure) hearing instrument candidates. In turn, effective therapeutic techniques could be implemented to modify an undesirable explanatory style. Cognitive therapy²⁰ has been used successfully to change individual beliefs, perceptions and interpretations. It is our contention that the assessment of behavior (explanatory style) and the initiation of therapeutic intervention, as in a cognitive approach, holds promise to improve the process related to identifying prospective hearing instrument wearers and assuring their success.

Post-Fitting Behavior Management and the Hearing Functioning Profile

There are numerous factors that may influence how well a person will function with amplification and it is important that dispensers fully understand how these factors may limit hearing instrument success. These parameters are considered in the Hearing Functioning Profile²¹ (Fig. 1).

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Factors that limit success:

The first limiting factor is overall hearing level in unaided and aided conditions. As a general rule, the greater the hearing loss, the less likely that the aided results will approach normal hearing functioning. The aided results typically leave a person in need of additional coping strategies. Most aided individuals perform as if there were still a mild or mild-to-moderate hearing loss. In addition to the degree of loss, there are limitations associated with tolerance, audiometric configuration, speech understanding and the use of a hearing instrument in only one ear.

▶ *Visibility* is often a critical factor in determination of success for many people with hearing impairment. Most individuals who use hearing instruments do much better, particularly in noisy environments, when they are able to watch the speaker.^{22,23,24} Vision works in tandem with residual hearing. Recognizing the important contri-

bution of the visual channel will help in devising recommendations for improving communication situations.

▶ *Angle* is important for speech reception for people who have a "better ear" or have been fitted monaurally. When speech is directed to the poorer hearing side, the "head-shadow" effect causes a loss of high-frequency information (primarily consonants) to the better ear. This directional consideration is important in devising recommendations for improving an individual's functioning in groups or in positioning the person relative to key environmental sounds.

▶ *Noise* interferes with speech understanding much more for people with hearing loss than for those with normal hearing.^{25,26} Individuals with impaired hearing, even with hearing instruments, need a much better signal-to-noise ratio in order to maximize speech understanding in the presence of competing noise.

▶ Another important consideration that limits hearing instrument effectiveness is *distance* of the listener

Hearing Functioning Profile								
Name: _____			Date: _____					
Description of situation	Is problem present...		Is it due to...					Comments:
	With hearing aid on?	With hearing aid off?	Hearing?	Angle?	Noise?	Distance?	Visibility?	
ALERTING:								
Telephone Bell								
Doorbell								
Sound (e.g., baby)								
Alarm clock								
Fire								
Other								
LISTENING:								
Television								
Phone Conversation								
COMMUNICATION:								
Planned (1/1)								
Unplanned (1/1)								
Group								
Other								
Further Information (e.g., Status of amplification, Description of living quarters, Co-habitants, Commun. Functioning, Voc./Ed., Occ.):								

Recommendations (e.g., Technology, Strategies, Environmental Manipulation):								

©J.E. Healey			Clinician's Signature: _____					

Fig. 1: The Hearing Functioning Profile.²¹

from the sound source. Even a minimal hearing impairment reduces the distance at which one can successfully understand speech. Hearing instruments are typically useful for speech understanding for a radius of about 6-10 feet from the source. The useful distance for other sounds, such as telephone bells, may be much greater. The distance problem is related to the noise problem in that it is essentially one of a need for a greater signal-to-noise ratio. Understanding this problem will help in devising management options for improvement of communications in and out of the home.

► The final limitation is due to *hearing instrument usage*. Some individuals use their hearing instruments most of the day, while others only use them situationally. With few exceptions, the typical hearing instrument user is a part-time user.

The Hearing Functioning Profile

The Hearing Functioning Profile was developed primarily as a post-fitting management strategy, but is not limited to this stage of intervention. The Profile is an evaluation tool that facilitates a review of several problem areas and systematically considers these areas within the framework of the factors above. It allows the dispenser to broaden management perspectives and to work more comprehensively toward improved hearing functioning.

For example, an individual may report difficulty hearing the telephone ring without their hearing instrument. This may be due to the degree of hearing loss even if the telephone is nearby. It may be a problem of angle (i.e., the telephone is located to the poorer hearing side). There may be competing stimuli, or noise. The problem could be distance of the listener from the telephone. Visibility could be a factor in the case of a profoundly hearing-impaired TDD user who needs a strobelight to indicate telephone ringing.

When a problem is identified, the factor(s) that may explain the problem is checked off on the form. Each listening category is reviewed relative to whether the problem exists with or without the hearing instrument. The form has a "Comments" section for elaboration. Other important components of the Profile are the questions about living quarters, co-habitants, general communication functioning, and any outstanding vocations, educational or occupational issues relative to hearing loss. The last section is critical because most dispensers do not address needs beyond communication in the home.

The Profile helps the dispenser understand the limitation of hearing instruments and think more broadly of the myriad of demands placed on the individual. For example, rather than limiting recommendations to devices that only help hear the television, it forces incorporation of all of the remaining difficulties into a series of recommendations. This organization helps to direct recommendations into three categories which are referred to as "S.E.T.": Strategies, Environmental manipulations and Technology.

There are "Strategies" that might minimize the reported problem. If, for example, a person reported difficulty with spontaneous conversation in the home, counseling could be included on ways to reduce frustrations with conversations from adjoining rooms. This is particularly relevant for people who are visually dependent for speech understanding. Strategies may include approaches for planned communication, such as at a dinner or committee meeting.

The "Environment" may be manipulated to make it more conducive to sound reception. For example, if a couple reports difficulty conversing at home when the TV is

on, an appropriate manipulation might be to limit talking to commercial breaks, to move chairs closer or improve the lighting for speechreading.

"Technology" can range from flashing lights to close-captioning to vibrating alarms. An advantage of the Profile is that it makes it easy for the hearing health care professional to organize the problems so that the most appropriate technology can be selected while consideration is given to strategies and environmental manipulations. For the couple with trouble conversing with the TV on, a quick fix might be the recommendation of an assistive listening device to allow the level of the TV sound to be reduced. A more cost-effective approach might be to try the strategy and environmental manipulation recommendations first, and then if they are not successful, a technology solution may be indicated.

This type of analysis also helps determine if technology needs to consider hearing instrument use. For example, it may be that a person only needs a flashing alarm at night because during the day their hearing instrument would suffice.

The use of the Hearing Functioning Profile greatly enhances management of hearing loss. It benefits those fitted with hearing instruments, but should also be considered for individuals who do not use hearing instruments. The Profile forces the hearing health care professional to organize management around the numerous demands on a person in everyday life. Too often strategies are limited to face-to-face conversation or TV watching. The Profile is a good therapy tool that allows for ample discussion of the importance of visibility, angle, noise, and distance—critical parameters that need to be incorporated into counseling. When using this tool, the hearing-impaired person has an opportunity to develop a better appreciation of the communication process and environmental considerations.

Summary and Conclusions

This article attempted to relate successful hearing instrument adaptation to behavioral issues of a theoretical and practical nature. We hypothesized that the trans-theoretical approach²² may have a place in bringing a non-hearing instrument wearer to a state of readiness to accept amplification. We also discussed why individuals fail or succeed in a variety of activities, possibly including experiences with hearing instruments, using a learned helplessness model.³ On a practical level, we presented an overview of the Hearing Functioning Profile, an instrument designed to monitor wearer post-fitting behavior leading to the successful management of problematic situations.

It is our view that some concepts related to behavior, effectively developed in the field of psychology, may have important links to the experiences of individuals wearing hearing instruments. That such relationships exist should be tested. If they exist, well-developed strategies from psychology should be adapted and utilized to promote a positive experience for hearing instrument wearers. We also believe that the routine analysis of wearer listening activities in specific environments is an important preface to devising compensatory strategies for increased success. This may also allow individuals to gain more control over hearing instrument wearing experiences and, as a result, increase their sense of empowerment.

The view suggested here comes not only from compelling work in psychology; recent evidence²⁷ indicates an overall decline in wearer satisfaction (53%) and an increase in instruments not worn from 12% in 1991 to 17.9% in 1994. Although there may be many reasons to account for these

trends, it is our contention that there is an implicit call that we go beyond the parameters conventionally used to assure hearing instrument wearer success.

To integrate the application of the concepts in this article in the hearing instrument delivery process, we recommend the following next steps:

- ▶ The hypothesis that hearing instrument wearers go through a behavioral change process should be tested.
- ▶ The hypothesis that hearing instrument success or failure may be related to attributional style should be tested.
- ▶ Assuming the hypothesis-testing bears out the relationships suggested in this article, appropriate management models should then be developed. Efficacy of the models should be determined.
- ▶ Effective management models should then be integrated as a routine part of practice.
- ▶ Hearing instrument wearers should be advised of environmental management techniques to facilitate communication. Further, they should be encouraged to play an active and analytic role in the integration of amplification devices with the environments in which they work and live. ■

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Correspondence can be addressed to Jay Singer, PhD, Department of Communicative Disorders, Univ. of Rhode Island, Kingston, RI 02881.