

Deafness Simulation Via Speech-Masking: An Experiential Learning Strategy

Harry G. Lang and Donna E. Pocobello
*National Technical Institute for the Deaf
Rochester Institute of Technology*

Simulating hearing loss in order to acquire a better understanding of deafness has become increasingly recognized as a useful experiential learning strategy for hearing professionals in faculty development, preservice, and inservice training programs. In the present report, the authors describe the use of speech-masking as a simulation technique. Narrative data recorded by 49 adults in journals during five group-training sessions were evaluated to identify some possible types of affective and cognitive learning which resulted, and to make recommendations for future applications of this technique. Collaborative planning with audiologists and structured processing of the insights gained from the speech-masking experience are recommended for enhancing the success of this strategy.

The use of simulated hearing loss as an aid to understanding the effects of deafness has been attempted in several ways. These methods include general simulation experiences through occlusion of the ear canals and the use of masking noise (Chafin & Peipher, 1979; Erber & Zeiser, 1974; Hebb, Heath, & Stuart, 1954; Lieberth, 1982; Lieth, 1972; Sims & Avery, 1978), as well as simulated loudness recruitment techniques to study speech perception (Gagné & Erber, 1987; Villchur, 1974). In the case of the general simulation studies, the authors have described the usefulness of these techniques to help those experiencing simulated hearing loss learn about various social and psychological aspects of deafness. When wearing the speech-masking aids, however, persons having little or no prior experience with deafness or deaf people may develop a variety of perceptions which can be either insightful or erroneous. The objectives for this paper are: (a) to provide additional details regarding the kind of skills and knowledge which are gained by deafness simulation when using the speech-masking aids as an experiential learning technique, and (b) to provide recommendations for enhancing the attainment of specific objectives as well as general

Address all correspondence to: Harry G. Lang, EdD, Department of Educational Research and Development, Educational Support Services Programs, National Technical Institute for the Deaf (NTID), Rochester Institute of Technology (RIT), Rochester, New York 14623-0887.

outcomes of this experience.

To evaluate the affective and cognitive experiences possible during a wide range of activities, 49 adults experiencing simulated deafness for the first time were asked to keep journals. The participants were enrolled in either sign language courses or a five-day professional development working conference. All of the participants in the sign language courses and one-third of the participants in the professional development working conference had no prior experience with deaf people. Those enrolled in the sign language courses were professionals in fields related to education of young deaf adults and human services. The professional development working conference included teachers, counselors, administrators, speech-language therapists, and three parents of deaf children.

Participants wore bilateral, ear-level Starkey Model TM 3 tinnitus masker hearing aids which were fitted with E-A-R® foam ear-canal inserts predrilled for #13 vinyl tubing. The aids were set on the "L" (low-frequency) response setting, and the output control was adjusted to provide 85 dB SPL noise output at full volume in a 2 cc coupler. Participants were instructed to adjust the volume controls of the aids after insertion so that a speaker standing face-to-face with them could not be understood by listening alone when saying the numbers 1 to 10. Sims and Avery (1978) found that this adjustment procedure resulted in an average "aided" Speech Reception Threshold of 72 dB HL when using the specially-modified Radioear 980 body-type aid. This procedure was generally effective in blocking most speech sounds, as observed in the participants' comments in their journals. "I heard essentially nothing above the masking noise," wrote one participant. Another explained, "I could hear loud, sharp noises, but voices were very muffled."

Participants used the maskers from three to eight hours and were asked to describe their perceptions, emotions, and reactions during the speech-masking experience. They reported that they wore the speech-masking aids while watching television, having dinner with family members at home, attempting to make an important phone call, or attending a lecture, theatre performance, or other information gathering or social experience.

CATEGORIZING THE JOURNAL ENTRIES

Three hundred and sixty-one comments made by 49 participants in the five speech-masking sessions were examined by the authors and five broad areas were defined: *Communication*, *Psychological Aspects*, *Physical Effects*, *Social/Cultural Aspects*, and *Increased Empathy*. During the first phase of the analysis, the authors independently categorized the comments. They then met to discuss the categories and to develop primary descriptors for each area. After the categories were established and discussed, the journal comments were again independently categorized. Disagreements were discussed and only the data that were grouped consistently in the third categorization were retained for the final analysis. With multiple categorizations of each journal entry possible, a total

Table 1
Response Categories and Frequencies of Occurrence of 361 Narrative Journal Entries

| | Basic Sign Courses | Professional Development Working Conference |
|--|---------------------------|--|
| No. Participants | 31 | 18 |
| No. Journal Entries | 224 | 137 |
| COMMUNICATION | 131 (38.2%) | 76 (38.2%) |
| PSYCHOLOGICAL ASPECTS | 64 (18.7%) | 33 (16.6%) |
| SOCIAL/CULTURAL ASPECTS | 27 (7.9%) | 25 (12.6%) |
| PHYSICAL EFFECTS | 57 (16.6%) | 21 (10.5%) |
| INCREASED EMPATHY | 64 (18.7%) | 44 (22.1%) |
| Total Number of Multiple Categorizations | 343 | 199 |

of 542 categorizations of the 361 comments were agreed on by the authors with a rate of agreement of 92 percent. Table 1 contains the frequencies of the journal comments falling into the five categories.

Communication

Two hundred and seven (39.2 percent) of the journal comments were related to communication – the use of speech, hearing, speechreading, sign language, vision, and touch. Some of the comments also addressed barriers in the process of conveying information between persons. Participants were quick to note the effect of having to depend primarily on vision for learning and communicating. After attending a formal lecture by a colleague, one participant reported being much more sensitive to the use of his own vision as well as needing to check the visual channels of other participants so that they were unobstructed. Concentration was necessary to avoid missing content, especially in following different people in group discussions. There were comments on the effects this had on shortening their attention span and increasing eye fatigue. Sign language made the difference between understanding and not understanding for some participants. Participants experienced a deeper appreciation for those who used clear and appropriate body language and facial expression. They also reported that they needed to rely on visual feedback to monitor their efforts, to adjust to a variety of other people's receptive and expressive skills, and to use whatever sign communication and speechreading skills they had acquired prior to the masking experience. They became increasingly sensitive to the difficulty of monitoring their own speech. Some did not realize that they were shouting, whispering, or interrupting conversations. They expressed uncertainty regarding the use of their voices, primarily because of embarrassment. Reflecting on personal experi-

ence, one participant summarized, "Because of this experience, I can readily understand . . . deaf [people] and why sometimes voice is present and sometimes not – I can really appreciate that – it makes me wonder if we have the 'right' as hearing people to request or sometimes demand that they [deaf people] use voice . . ."

Psychological Aspects

Ninety-seven (17.9 percent) of the journal comments were psychological in nature. Comments were included in this category if they pertained to behaviors, feelings, or attitudes of the participants or significant others, as shown in the following example:

Immediately upon my return to the office area, I felt dependent. I had to explain to G. that I was expecting the following calls and what to do about each. One was a private call, so I immediately felt a loss of privacy. And I noted that my directions/instructions were not clear. My ability with language and others' ability to communicate with me resulted in the language controlling what we wanted to say. There were "communication shortcuts," leaving something to assumptions which, of course, will lead to miscommunication and non-communication.

The initial loss, the isolation, and the frustration experienced in attempting to communicate with others were complicated by challenges of adjustment. Some of the participants experienced embarrassment associated with the cosmetic factor of wearing something "foreign" on their heads, and others became sensitive to the acoustic leakage of the masking sound from their aids. Some even overreacted when they found people looking quizzically at them. In the context of the classroom, participants experienced the emotional struggles associated with being unable to understand in group situations. One explained, "It was a very frustrating experience for me to have a rough idea of what was being said in class, but to not know precisely."

Social/Cultural Aspects

Fifty-two comments (9.6 percent) dealt with relationships, hearing or deaf, and the ways in which the speech-masking experience helped the participants learn about Deaf culture and community. Participants found social relations more strained. For example, servers in restaurants generally talked to the participants' hearing companions while taking orders. Some participants became introverted because their initial efforts to communicate were unsuccessful. One wrote, "I got a number of confused quizzical looks – particularly when I gave some obviously strange replies to people." Others felt annoyed when not included in the social exchanges: "It was isolating socially and I was irritated when those speaking at coffee break did not [also] sign."

In relation to ethnographic perceptions, two particular facts about Deaf culture were experienced by some of the participants. First, in regard to the importance of visual language, and especially the use of sign language, some participants

perceived an increased dependence on non-verbal communication, facial expressions, and body language. They sought signs of affection, prejudice, and other emotions in their communicative exchanges. Occasionally, they felt rewarded when their perceptions were accurate; other times they were embarrassed when they misunderstood the intent of another individual's message.

Second, some participants were comforted with the support and companionship they experienced when they were with others who participated in the speech-masking activity. "Three hours with the masking was long enough as far as I am concerned," wrote one person. "As the class went on, I got more and more introverted and lonely. I felt like crawling into a hole all by myself. I became very self-conscious . . . the only people I tried to talk to were others with the maskers on." Another participant wrote, "I had a hearing handicap. Others had a communication handicap. If I were deaf, I would gravitate to those who did not have a communication handicap, i.e., other deaf people. As a hearing person, I gravitate toward those who do not have a hearing handicap, i.e., hearing persons. There's certainly parsimony here."

Physical Effects

Seventy-eight comments (14.4 percent) related to two types of physical descriptions. As mentioned earlier, one type of comment in this category included descriptions of what could and could not be heard with the speech-masking aids in use. In addition, there was a variety of physical descriptions not directly associated with the maskers. For example, one participant wrote of "a tired feeling because I had to work harder than usual to communicate." Another described increased body awareness. "I could hear swallowing, bones cracking as I walked, chewing sounds." A third person experienced a phenomenon common to late-deafened people: "I couldn't hear the paper fall, but as it was falling I could remember the noise it should make and as I watched it my brain added the noise." And a fourth individual spent puzzling moments at a water fountain, hesitating to drink because the water made no detectable splashing sounds.

Increased Empathy

One hundred and eight comments (19.9 percent) were general reactions of the participants in which they identified many attitudes and behaviors one might discuss in an introductory workshop on deafness. Actually experiencing hearing loss, however, according to one participant, provided a personal base on which one can build a more effective understanding. "This is the only way to come close to knowing what deafness feels like," one participant wrote, "it's fine to read and hear about deafness, but the experience points out all the little subtle differences that not even the deaf teachers think to tell us about."

Comments were included in this category if they indicated a greater understanding of deafness as a human condition. "I have tried," wrote one person, "to adequately express my feelings about this experience – but somehow, I don't think people completely comprehend the depth of the impact it has had upon

me!” Another wrote, “I would recommend this to anyone on a serious level. It’s not a game, or something to ‘tune out’ of the lectures. You have to work a lot harder to understand.”

RECOMMENDATIONS FOR THE USE OF THE SPEECH MASKING AIDS

The data obtained from the narrative writing of hearing professionals while using speech-masking aids indicate that valuable insights can be developed through experiential learning. Several recommendations are provided below for those who are interested in this technique:

1. Structuring the Activities

When participants are allowed to choose their own activities during simulation, many *general* perceptions about the effects of deafness usually result. However, participants in special-topics seminars or courses (e.g., sign language, speech-reading, psychology, or ethnography) may be guided toward more *specific* outcomes derived through the personal experiences associated with structured speech-masking activities.

2. Processing the Experiences

Regardless of the level of structure in the activities, there is a need to “process” experiential learning through discussion following the use of the masking aids. Such discussions may be centered on the descriptive experiences and emotions of the participants, as recorded in journals. Although the speech-masking aids more or less simulate moderate-to-severe adventitious deafness (Sims & Avery, 1978), discussions with hard-of-hearing and profoundly-deaf people were valuable in helping participants compare and contrast their experiences with those of people having various ages of onset and degrees of hearing loss. The processing discussion facilitates understanding of the limitations of the speech-masking experience. In particular, exaggerated perceptions can be placed in a more realistic light. The processing is also helpful in bridging initial perceptions to classroom teaching, counseling, parenting, administration, and other scenarios. Participants preparing to teach deaf students, for example, realized how group discussions are difficult without appropriate communication management. They shared the perceived skills and knowledge needed for effective communication, in general, and for effective lecturing, in particular. The latter included comments on the importance of not turning to the blackboard, thus shutting off the ability to read signs or to speechread. Also, participants described the difficulty in attending to multiple visual tasks simultaneously – watching lectures, overhead projections, attending to the teacher’s instructions, finding the correct place to read in a text or handout – all the while having to deal with visual distractions ranging from a fluttering piece of paper on a bulletin board to someone else entering the classroom and sitting in front of them.

In relation to psychological perspectives, one participant wrote in a journal

that colleagues who otherwise would have been classified as “excellent students” in their sign language course suddenly appeared “average” or even “poor” while wearing the masking aids. This individual made note of the inappropriateness of judging the abilities of people based on the apparent difficulties they have in communicating. The discussion which followed this comment was especially thought-provoking when deaf panelists shared their personal encounters with stereotyping and other attitudinal barriers.

In regard to cultural aspects, especially the role of communicating through sign language, participants described the appreciation of sign language acquired through the experience.

There is risk that those wearing the speech-masking aids might form certain misconceptions and stereotypes about deaf people and deafness. One example of this occurred in a processing discussion when a participant complained that others had “really gotten into it and played at deafness.” When asked for clarification, it became apparent that the participant was stereotyping deaf people. One of the panelists then described some characteristics of the grammar of American Sign Language that are unique, and a potentially sensitive situation turned into a positive learning experience. In another processing session, a poem was shared in which deafness was viewed primarily as a “handicap.” “And it must be terrible,” wrote the participant, “never to hear . . . the tenderness of meanings in a soft-spoken word.” Again, the deaf panelists facilitated the discussion by pointing out how people often adjust to a world of silence and learn to live comfortably, finding “tenderness” through visual channels. In a third example, a participant who wore the speech-masking aids wrote that “the real impact for me was that we, not they, have the handicap – because we too often take our senses for granted, whereas they have highly developed their remaining senses and, I believe, are much more aware of much of life that we completely overlook.” This generalization sparked considerable discussion with deaf people who shared their own perspectives on the various ways people learn to appreciate and make use of their senses.

The use of a journal or log of experiences and a follow-up workshop involving deaf people to process the information and attitudes may not only reduce misunderstandings about deafness but may help participants make use of the insights to build a perspective in which they respect individual differences and preferences among people who are deaf. The authors have selected a few journal comments to illustrate certain types of learning. In some cases, these comments were made by only a few participants. Thus, another benefit of the processing discussion is to provide a forum for participants to learn from the viewpoints of others which may have developed from singular experiences. As one participant wrote: “It was important to have this experience; I really needed to share this experience; I would never suggest a day wearing a masker without a follow-up.”

3. Precautions

Physical and psychological discomfort are two concerns which must be taken

into consideration. Some participants complained that others around them could hear the masking noise. "I saw myself taking this personally," wrote one individual, "but on the other hand I wanted people to tell me as I didn't want them to be bothered by my aids." The participants asked the panelists whether it was proper to inform deaf people about the feedback noise when they have ill-fitting ear molds. Sims and Avery (1978) present several additional cautionary notes in regard to other physical concerns associated with the use of speech-masking aids: (a) Persons with known hearing loss or ear pathology such as ear infection should not use the speech-masking aids without written permission from their doctor; (b) One must watch for participants who may experience irritation or pain while wearing the aids. If this occurs, the masking experience should be immediately discontinued; and (c) No more than eight hours continuous use of the masking aids is suggested. Lieberth (1982) recommends that volume and MPO settings of the maskers should be determined by the audiologist using appropriate hearing aid measuring equipment. Warnings should be given to participants not to exceed this setting.

In view of these concerns, it is important that trained audiologists assist with the masking experience to assure that appropriate instructions are provided and Occupational Safety & Health Administration noise dose limits are followed.

Sims and Avery (1978) also describe the inherent dangers in driving automobiles, walking in traffic, and other activities with which experienced deaf persons have learned to compensate. One way to reduce the chances of injury is to have participants work in pairs with only one person experiencing masking during activities that may involve such risks.

With appropriate supervision and flexibility, the speech-masking experience can be a very positive one. Occasionally, however, the experience may not. As one of the participants had reported in a journal, "All I could handle was sitting through the lecture, and taking a walk outside." This individual did not wish to continue the simulated hearing loss after these initial experiences, and the maskers were removed. The decision in itself was a learning experience. During the processing discussion, late-deafened people described similar reactions to actual hearing loss. Importantly, participants should be informed that they have the choice to withdraw from the experience at any time.

CONCLUSION

Professionals experimenting with speech-masking in elementary programs as well as on the postsecondary level have found the technique helpful in increasing awareness about the effects of deafness. Participants have recommended the experience for everyone involved with the education of people who are deaf – including audiologists, teachers, administrators, counselors, interpreters, parents, and fellow students. As mainstream education becomes the rule, rather than the exception, in North American schools, methods to heighten consciousness and promote dialogue among groups are essential. The use of speech-mask-

ing, with appropriate audiological support, can play a vital role in bringing hearing and deaf people to shared understandings in the educational setting.

REFERENCES

- Chafin, P., & Peipher, R.A. (1979). Simulated hearing loss: An aid to in-service education. *American Annals of the Deaf*, *124*, 468-471.
- Erber, N.P., & Zeiser, M.L. (1974). Classroom observation under conditions of simulated profound deafness. *Volta Review*, *76*, 352-360.
- Gagné, J., & Erber, N.P. (1987). Simulation of sensorineural hearing impairment. *Ear and Hearing*, *8*, 4, 232-243.
- Hebb, D.O., Heath, E.S., & Stuart, E.A. (1954). Experimental deafness. *Canadian Journal of Psychology*, *8*, 152-156.
- Lieberth, A.K. (1982). Simulated hearing impairment: A training technique for professionals. *Volta Review*, *84*, 291-295.
- Lieth, L.v.d. (1972). Experimental social deafness. *Scandinavian Audiology*, *1*, 81-87.
- Sims, D.G., & Avery, J. (1978, November). *A method for simulating the psychosocial impact of deafness*. Paper presented at the convention of the American Speech and Hearing Association, San Francisco, CA.
- Villchur, E. (1974). Simulation of the effect of recruitment on loudness relationships in speech. *Journal of the Acoustical Society of America*, *56*, 1601-1611.