

On Making Oral Histories More Accessible to Persons with Hearing Loss

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Abstract: This essay recommends a series of steps that can be taken to make oral histories more accessible to persons who have hearing loss. Recommendations are offered for those who record oral history interviews and also for those who disseminate them. These recommendations are intended to mitigate some of the limitations on speech understanding that are experienced daily by the millions of people in the United States who have a hearing loss.

Keywords: hearing impairment, hearing loss, listening effort, sign language

Depending on its type and extent, a hearing loss may impose limits on speech understanding that range from mild to profound.¹ Examples of the former include occasional difficulty hearing individual speech sounds and some misrecognition of words when they are produced by someone who speaks quietly. Examples of the latter include a complete inability to recognize any speaker's words or so limited an ability that the spoken message is grossly misunderstood. The purpose of this article is to recommend a series of steps that oral historians can take to make oral history records more accessible to individuals who have a hearing loss. Among those steps is the creation of an added form of access (sign language interpretations) that can make oral histories more accessible to even those with the most severe hearing impairments.

¹ Over thirty-one million people in the United States have a hearing loss. This number is expected to grow significantly over the next several decades as the U.S. population ages. Approximately eleven million people in the U.S. currently wear a hearing aid, and approximately seventy thousand have a cochlear implant. Sergei Kochkin, "MarkTrak VII: Hearing Loss Population Top 31 million People," *The Hearing Review* 12 (2005): 16–29; "Incidence and Prevalence of Hearing Loss and Hearing Aid Use in the United States—2008 Edition," American Speech-Language-Hearing Association, <http://www.asha.org/Research/reports/hearing/> (accessed January 10, 2013).

Most people who have a hearing loss can recognize speech well enough to understand the substance of a spoken message, particularly if the listening conditions are favorable and if they are wearing hearing aids. But hearing-impaired listeners also tend to be quite sensitive to the acoustics of any situation, and any reduction in the quality of those acoustics almost always affects them more negatively than it does normally hearing listeners.² With that in mind, several of the recommendations made here look to the latest available technologies to maximize the audio quality of oral history recordings, both at the time those recordings are made and also later when they are disseminated to listeners.

A second feature of hearing loss is that its effects can be compensated for, to some degree, by especially attentive and effortful listening.³ However, listening of this kind can be fatiguing and difficult to maintain for the length of time required to fully engage an oral history interview. Also, effortful listening draws cognitive resources away from higher levels of speech-language processing and from other co-occurring activities. This explains why listeners with hearing loss can have reduced memory for previously heard spoken messages, and why they may have difficulty taking notes or performing other cognitively demanding tasks while listening to speech.⁴ To minimize effects of this kind, several actions are recommended that can make oral histories easier to understand and hence less effortful to listen to. These can be beneficial to any listener and particularly beneficial to any listener who has a hearing loss.

Recommendations

Improve the Audio Quality of Oral History Recordings

Hearing-impaired listeners are especially sensitive to the quality of the speech audio signal and tend to be disproportionately affected by any factor that reduces

²Terese Finitizo-Hieber and Thomas Tillman, "Room Acoustics Effects on Monosyllabic Word Discrimination Ability for Normal and Hearing-Impaired Children," *Journal of the Acoustical Society of America* 21 (1990): 440–58; Richard W. Harris and David W. Swenson, "Effects of Reverberation and Noise on Speech Recognition by Adults with Various Amounts of Sensorineural Hearing Loss," *Audiology* 29 (1990): 314–21; Anna K. Nabalek and James M. Pickett, "Monaural and Binaural Speech Perception Through Hearing Aids Under Noise and Reverberation with Normal and Hearing Impaired Listeners," *Journal of Speech and Hearing Research* 17 (1974): 724–39.

³Brad Rakerd, Phillip F. Seitz, and Margaret Whearty, "Assessing the Cognitive Demands of Speech Listening for People with Hearing Losses," *Ear and Hearing* 17 (1996): 97–106; Anastasios Sarampalis et al., "Objective Measures of Listening Effort: Effects of Background Noise and Noise Reduction," *Journal of Speech, Language and Hearing Research* 52 (2009): 1230–40.

⁴James F. Feuerstein, "Monaural Versus Binaural Hearing: Ease of Listening, Word Recognition, and Attentional Effort," *Ear and Hearing* 13 (1992): 80–86; Candace B. Hicks and Anne M. Tharpe, "Listening Effort and Fatigue in School-Age Children With and Without Hearing Loss," *Journal of Speech, Language, and Hearing Research* 45 (2002): 573–584; Patrick M. Rabbitt, "Mild Hearing Loss Can Cause Apparent Memory Failures Which Increase with Age and Reduce with IQ," *Acta Otolaryngologica Supplementum* 476 (1991): 167–76; Rakerd et al., "Assessing the Cognitive Demands of Speech Listening," 97–106.

that quality. An important first step toward increasing their access to oral histories will therefore be to take full advantage of ever-improving microphone and digital recording technologies to maximize the fidelity of future oral history recordings. In this regard, it is notable that while a large majority of respondents to a recent Institute of Museum and Library Services (IMLS) field survey reported that they have already used or will soon begin to use digital technologies when recording their interviews, only about half of them also reported that they had been formally trained in the use of those technologies.⁵ Thus, it will be important to increase the general knowledge level about acoustical challenges that are present whenever speech is being recorded and about technologies and best-practice recording methods that can be used to effectively address those challenges. The Oral History in the Digital Age website features several tutorials on these topics.⁶

Improving the quality of future recordings can also be expected to provide greater access to oral histories for young listeners, for the elderly (including those who have little or no hearing loss), and for anyone who is a nonnative speaker of the interviewee's language. All of these groups are at special risk for misunderstanding spoken messages whenever the speech signal becomes degraded.⁷

Create Effective Listening Spaces

The IMLS survey also asked oral historians to estimate the duration of their most recent interview. In over 90 percent of cases, respondents reported that the interview extended for an hour or more. Clearly, anyone who hopes

⁵ Steve Cohen et al., "Oral History in the Digital Age: The Imperative for Rethinking Best Practices Based on a Survey of the Field(s)," in *Oral History in the Digital Age*, ed. Douglas Boyd, Steve Cohen, Brad Rakerd, and Dean Rehberger (Washington, DC: Institute of Museum and Library Services, 2012), <http://ohda.matrix.msu.edu/2012/07/ohda-survey/>.

⁶ All of the following tutorials appear in *Oral History in the Digital Age*, ed. Douglas Boyd, Steve Cohen, Brad Rakerd, and Dean Rehberger (Washington, DC: Institute of Museum and Library Services, 2012), <http://ohda.matrix.msu.edu/>: Douglas Boyd, "Digital Audio Recording: The Basics," <http://ohda.matrix.msu.edu/2012/06/digital-audio-recording/>; Douglas Boyd, "Achieving Good Audio Recording Levels," <http://ohda.matrix.msu.edu/2012/06/achieving-good-audio/>; Charles Hardy and Douglas Boyd, "Understanding Microphones," <http://ohda.matrix.msu.edu/2012/06/understanding-microphones/>; Brad Rakerd, "Microphones and Room Effects: Audio Exemplars and Some Recommendations for Enhancing the Quality of Oral History Recordings," <http://ohda.matrix.msu.edu/2012/06/microphones-and-room-effects/>; Brad Rakerd, "Speech in Quiet and Speech in Noise: Audio Exemplars and Some Recommendations for Enhancing the Quality of Oral History Recordings," <http://ohda.matrix.msu.edu/2012/06/speech-in-quiet-and-speech-in-noise/>.

⁷ Carl C. Crandell, "Classroom Acoustics for Normal-Hearing Children: Implications for Rehabilitation," *Educational Audiology Monographs* 2 (1991): 18–38; Carl C. Crandell and Joseph J. Smaldino, "Speech Perception in Noise by Children for whom English is a Second Language," *American Journal of Audiology* 5 (1996): 47–51; Lois L. Elliott, "Effects of Noise on Perception of Speech by Children and Certain Handicapped Individuals," *Journal of Sound and Vibration* 71 (1982): 9–14; Anna K. Nabalek and Amy M. Donohue, "Perception of Consonants in Reverberation by Native and Non-Native Listeners," *Journal of the Acoustical Society of America* 75 (1984): 632–34; Reinier Plomp and A. M. Mimpen, "Speech-Reception Threshold for Sentences as a Function of Age and Noise Level," *Journal of the Acoustical Society of America* 66 (1979): 1333–42; William S. Yacullo and David B. Hawkins, "Speech Recognition in Noise and Reverberation by School-Age Children," *Audiology* 26 (1987): 235–46.

to consume even a fraction of the typical oral history record must make a commitment to listening that is not only thoughtful and integrative but also sustained. As noted above, individuals with hearing loss often find sustained listening to be difficult. Libraries and museums can mitigate at least some of this difficulty by creating listening spaces for both individuals and groups that are tailored to meet the special needs of the hearing impaired. These spaces should be acoustically well treated to minimize the negative effects of any occasional noise that might arise within the room. They should also be isolated, as much as possible, from noise sources elsewhere within the building (especially heating, ventilation, and air-conditioning systems) and from noise sources outside.

When creating these spaces, it will be important to engineer in technology that now allows speech and other audio signals to be delivered directly to a hearing-impaired listener's hearing aids or cochlear implants, thereby taking the fullest possible advantage of their amplification characteristics. Assistive listening systems of this kind (often referred to as hearing-loop or induction-loop systems) are being used increasingly in schools and other public places.⁸ The Hearing Loss Association of America provides excellent resources for learning more about induction-loop systems and about other assistive technologies for the hearing impaired.⁹

Provide Visual Speech Cues

When attending a public lecture, audience members tend to seek out seats that provide the best possible view of the presenter. One reason for this is that they like to visually gauge the presenter's manner in complement to his/her words. But there is also another reason, one especially relevant to the present article, which is that they are better able to understand the presenter's words when they can see those words being spoken. This is especially true if any sort of background noise is present in the room. Having access to visual information has also been shown to enhance the understanding of speech that conveys particularly challenging subject matter and speech that is produced by a speaker who has a significant accent.¹⁰

⁸David G. Myers, "Progress Toward the Looping of America—and Doubled Hearing Aid Functionality," *The Hearing Review* 17 (2010): 10–17.

⁹"Hearing Loss Association of America," <http://www.hearingloss.org> (accessed January 10, 2013).

¹⁰Paul Arnold and Fiona Hill, "Bisensory Augmentation: A Speech Reading Advantage when Speech is Clearly Audible and Intact," *British Journal of Psychology* 92 (2001): 339–55; Alison MacLeod and Quentin Summerfield, "A Procedure for Measuring Auditory and Audio-Visual Speech-Reception Thresholds in Noise: Rationale, Evaluation, and Recommendations for Use," *British Journal of Audiology*, 24 (1990): 29–43; Lawrence D. Rosenblum, Jennifer A. Johnson, and Helena M. Saldaña, "Visual Kinematic Information for Embellishing Speech in Noise," *Journal of Speech and Hearing Research* 39 (1996): 1159–70.

The cogency of visual speech information for all listeners—including listeners who may not believe themselves to be effective lip readers—is demonstrated by the McGurk Effect. This effect begins with an audio-only recording of a voice saying a clearly recognizable sequence of syllables, such as “ba - ba - ba - ba.” The effect then continues in an audio-visual mode, with the previously recorded audio track now paired with a video recording of someone saying a different syllable sequence that can be read on the face, such as “fa - fa - fa - fa.” In this second case, *what you hear is what you see*. That is, the audio-visual perception is of someone saying “fa,” even though the audio signal alone is clearly perceived as “ba.”¹¹

Gaining access to visual speech cues can be especially important for hearing-impaired listeners, because the visual cues will supplement whatever can be heard in the audio record and, in turn, make a speaker’s message easier to understand.¹² One evidence of the important role that visual cues can play for the hearing impaired is that cochlear implant users who can converse effectively in one-on-one conversational situations often report that they are much less successful when they must talk on the telephone and can no longer see the speaker. They also report that they find telephone listening to be especially effortful.¹³

All of this leads to two best-practice recommendations, one for those who make original recordings of oral history interviews, the other for those who disseminate those recordings. At the time an original recording is made, it is strongly recommended that a high-fidelity video “head shot” of all interview participants should be captured. When an interview is disseminated, either in a museum or a library or online, it is recommended that a video track that features easily visible facial cues should be made available to any user who may wish to view it in synchrony with the corresponding audio record.

Provide Contextual Support for Effective Listening

Speech is easier to understand when you have a context for listening. For example, the individual words in sentences like (a), (b), and (c) are perceived

¹¹ Harry McGurk and John MacDonald, “Hearing Lips and Seeing Voices,” *Nature* 264 (1976): 746–48; “The McGurk Effect,” University of California–Riverside, <http://www.faculty.ucr.edu/~rosenblu/VSMcGurk.html> (accessed January 10, 2013); “Hearing with your Eyes: The McGurk Effect,” National Technical University, <http://homepage.ntu.edu.tw/~karchung/Phonetics%2011%20page%20seventeen.htm> (accessed January 10, 2013).

¹² Marcia J. Hay-McCutcheon, David B. Pisoni, and Karen I. Kirks, “Audiovisual Speech Perception in Elderly Cochlear Implant Patients,” *Laryngoscope* 115 (2005): 1887–94; Lorin Lachs, David Pisoni, and Karen Kirks, “Use of Audiovisual Information in Speech Perception by Prelingually Deaf Children with Cochlear Implants: A First Report,” *Ear and Hearing* 22 (2001): 236–51; Brian Walden, Robert Prosek, and Don W. Worthington, “Auditory and Audiovisual Feature Transmission in Hearing-Impaired Adults,” *Journal of Speech and Hearing Research* 18 (1975): 272–80.

¹³ Rana Alkhamra, “Cognitive Effort and Perception of Speech by Postlingually Deafened Adult Users of Cochlear Implants” (PhD dissertation, Michigan State University, 2010).

with significantly greater ease and accuracy than the words in sentences like (d), (e), and (f).¹⁴

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|-------------------------------|-------------------------------|
| (a) "Tough guys sound mean." | (d) "Thin books look bright." |
| (b) "Cooks make hot food." | (e) "Ducks eat old tape." |
| (c) "Sharp nails might hurt." | (f) "Knees talk with mice." |

Semantic linkages within the sentences in the first group are clearly stronger than the linkages within the sentences in the second group, and these linkages set a context for listening that makes everything more recognizable. A context for effective listening can also arise from factors outside the spoken message itself. A well-known example of this takes place on commuter trains where persons who ride day after day develop knowledge of the route that facilitates their understanding of broadcast announcements about upcoming stops. This facilitation can be great enough that it allows them to understand the messages clearly, even when the acoustics are so poor that occasional travelers find those same messages unintelligible.

The key point for those who present oral histories is that they can facilitate effective listening by the hearing impaired and by others with special needs, by providing supplemental material that puts an interviewee's spoken messages in context. For example, images semantically related to the spoken content could be presented to "set the scene" for listening. These images could either stand alone or be presented in coordination with other materials, such as a transcript of the spoken message. To be maximally effective, contextualizing images should be presented in advance of a corresponding speech passage to fully prepare the listener. Also, the imagery should update dynamically, establishing a new context for listening any time there is a change of topic about to take place in the discourse.

Provide Time for Thoughtful Processing

Having a bit of extra time can sometimes make the difference between achieving only a basic understanding of a spoken message and achieving a deeper and more memorable understanding of it. Conversely, when speech processing becomes rushed, a speaker's words may be misunderstood or perhaps not understood at all. All of this is true for any listener, but it is especially true for listeners who have hearing loss or other communication challenges. For example, slowing the rate of speech has been shown to improve the accuracy of speech

¹⁴Arthur Boothroyd and Susan Nittrouer, "Mathematical Treatment of Context Effects in Phoneme and Word Recognition," *Journal of the Acoustical Society of America* 84 (1988): 101–14; Susan Nittrouer and Arthur Boothroyd, "Context Effects in Phoneme and Word Recognition by Young Children and Older Adults," *Journal of the Acoustical Society of America* 87 (1990): 2705–15.

recognition by cochlear implant users and speeding the rate has been shown to markedly increase misunderstanding by nonnative language users.¹⁵

Speakers seem to have an intuitive appreciation of the importance of time, because, when asked to speak as clearly as possible, they commonly adopt a moderate speaking rate and also introduce more and longer pauses in between their words.¹⁶ Their behavior suggests several best-practice strategies for the presentation of oral history records. One is to present material to a user in segments that are then followed by pauses long enough to allow time for thoughtful processing. A second is to provide the user with a means to conveniently halt and resume a presentation at self-selected times. Still another is to provide the user with direct control of the overall rate of delivery of a presentation. Finally, the present recommendation for providing pause time could be implemented in combination with the previous recommendation to use imagery in order to set a visual context for listening. During a pause, the images associated with a just ending segment could be faded out. Then those associated with the upcoming segment could be faded in to mark its beginning.

Provide Signed Interpretations

The tone and volume range and the rhythm of popular speech carry implicit meaning and social connotations which are not reproducible in writing. . . . The same statement may have quite contradictory meanings, according to the speaker's intonation, which cannot be represented objectively in the transcript, but only approximately described in the transcriber's own words.¹⁷

Alessandro Portelli's comments about the subtlety and richness of human communications, though made specifically about spoken language, apply equally to language that is signed. Evidence of this can be seen clearly in signed poetry and in signed theatrical performances, both of which are vivid, compelling, and much richer than any possible transcript of the signer's words.¹⁸ A new

¹⁵Satoshi Iwasaki et al., "Contribution of Speech Rate to Speech Perception in Multichannel Cochlear Implant Users," *Annals of Otolaryngology, Rhinology, and Laryngology* 111 (2002): 18–21; Lu-Feng Shi and Nadia Farooq, "Bilingual Listeners' Perception of Temporally Manipulated English Passages," *Journal of Speech, Language and Hearing Research* 55 (2012): 125–38.

¹⁶Michael Picheny, Nathaniel Durlach, and Louis Braid, "Speaking Clearly for the Hard of Hearing, II. Acoustic Characteristics of Clear and Conversational Speech," *Journal of Speech and Hearing Research* 29 (1986): 434–46; Shuli S. Reich, "Significance of Pauses for Speech Perception," *Journal of Psycholinguistic Research* 9 (1980): 379–89.

¹⁷Alessandro Portelli, *The Death of Luigi Trastulli and Other Stories: Form and Meaning in Oral History* (Albany: State University of New York Press, 1991), 47.

¹⁸"American Sign Language Poetry: 'Hearts and Hands'," American Sign Language University, <http://lifefprint.com/asl101/topics/poetry.htm> (accessed January 10, 2013); "National Theatre of the Deaf," <http://www.ntd.org/> (accessed January 2013); "Pop songs, poetry, and speeches in sign language," Gallaudet University Library, <http://libguides.gallaudet.edu/content.php?pid=114804&sid=991913> (accessed January 10, 2013).

and notable way to make oral histories accessible to persons who use sign as their principal mode of communication would be to provide signed interpretations of those histories.

Sign language interpreters are trained to render real-time translations of oral presentations. They often do so at lectures and other public events, and, in so doing, they make those events accessible to persons who are deaf or severely hard of hearing. An interpreter could similarly provide a real-time interpretation of an oral history interview and could be videotape-recorded while doing so. The resulting video record would then become a new and significant artifact that could be made available for viewing, either alone or in combination with the corresponding spoken record. Key time points in the video record could be identified through content analysis to be carried out by trained signers, and the resulting index could then be made available for cross-referencing with other indices to oral histories, both spoken and signed.¹⁹ Resources for learning more about interpretive signing, and for contacting interpreters in all fifty states, are available from the Registry of Interpreters for the Deaf.²⁰

Summation

Collecting and disseminating oral histories gives voice to people who might not otherwise be heard. Taking any of the several actions recommended here can provide greater access to those voices to people who might not otherwise be able to hear them clearly or appreciate them fully. Several of the recommended actions can benefit not only hearing-impaired listeners but also others who may have normal hearing but are nonetheless at risk for misunderstanding speech. Other actions will be uniquely important to persons who have hearing loss. All of these actions can be expected to provide increased access to the richly meaningful inventory of oral history records. Excellent resources for learning more about human hearing and about the causes and consequences of hearing loss are provided by the American Speech-Language-Hearing Association and by the National Institute on Deafness and Other Communication Disorders.²¹

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¹⁹ My thanks to Michael Frisch for this excellent suggestion about content analysis of signed video records.

²⁰ "Registry of Interpreters for the Deaf," <http://www.rid.org/> (accessed January 10, 2013).

²¹ "American Speech-Language-Hearing Association," <http://asha.org/> (accessed January 10, 2013); "National Institute on Deafness and Other Communication Disorders," National Institutes of Health, <http://www.nidcd.nih.gov/> (accessed January 10, 2013).