How Communication Goals May Alter Handicap

Les buts de la communication langagière et leur influence sur le handicap

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Abstract

Hard-of-hearing individuals often report a degree of handicap considerably different from that predicted by their hearing impairment. This disparity may exist because procedures for assessing hearing impairment implicitly assume that the purpose of language is primarily transactional (the exchange of information). We present data from conversations between hard-of-hearing and normally hearing individuals to argue that assessment of handicap must take into account the interactional as well as the transactional function of language. The relative importance of these two basic language functions varies across communication situations and depends on how individuals interpret these situations. This leads one to predict that, for a given individual, handicap will vary according to communication context, and in a given context, individuals with similar levels of hearing impairment will have different perceptions of handicap.

Abrégé

Les personnes malentendantes rapportent souvent un degré de handicap assez différent de celui qu'on pourrait prédire sur la base de leur perte d'audition. Cette différence pourrait provenir du fait que les méthodes audiologiques supposent implicitement que le but du langage est principalement transactionnel. Les données présentées ici, tirées de conversations entre personnes malentendantes et personnes qui entendent normalement, montrent que l'évaluation du handicap doit tenir compte non seulement de la fonction transactionnelle du langage, mais aussi de sa fonction interactionnelle. L'importance relative de ces deux fonctions de base du langage varie d'une situation à l'autre et dépend de la façon dont chaque individu interprète chaque situation. Il en résulte que pour chaque individu, le handicap variera selon le contexte, et que dans un contexte donné, des individus ayant une perte d'audition semblable percevront différemment leur handicap.

Hard-of-hearing individuals often report a degree of handicap that is considerably different from the level predicted by their hearing impairment or even the level predicted by their hearing disability. A mildly hearing-impaired businessman may, for example, be very handicapped if he misunderstands an important part of a business transaction. In contrast, a severely hearing-impaired senior who lives alone may experience little handicap in her daily life. Clearly it is the nature of the communication demand that differs in these two cases. The issue is not so much what is heard, as what has to be done with what is heard.

While the validity of clinical procedures to assess hearing impairment is not in question, the ability of these procedures to measure communication disability and handicap *is* in question. As Noble points out, traditional procedures are restricted to measurement of the hearing mechanism and its function; the question of what it means to hear is answered within the framework of a mechanical-biological model, a model that is not ecologically valid (1983, pp. 327-28). Recognizing the need to determine how hard-of-hearing individuals function in real communicative interactions, audiologists have recently developed assessment instruments such as interviews, questionnaires (e.g., the *Communication Profile for the Hearing Impaired*, Demorest & Erdman, 1987; the *Hearing Handicap Inventory for the Elderly*, Ventry & Weinstein, 1982), and techniques for evaluating elicited in-clinic conversations (e.g., the *Topicon*, Erber, 1988; the *Repair Strategies Index*, Tye-Murray, 1991). But there continues to be a need for feasible, valid clinical procedures for assessing hearing in the real world (Tye-Murray, 1994).

Part of the challenge in developing such procedures is to understand the nature of communication. In their attempts to try to capture real-world communication function in the laboratory conditions of the clinic, clinicians have, to date, generally made the (implicit) assumption that the purpose of communication is to exchange information. For example, the focus of Erber's (1988) Topicon is the fluency and rate of exchange of information; the hard-of-hearing person's

conversational success is measured in terms of this single function of communication.

In this article we argue that assessment of disability, and certainly the assessment of handicap, must take into account a second, at least equally important function of communication—the interactional, or interpersonal, function. This claim arises from our study of a hard-of-hearing individual conversing with a normally hearing conversational partner in the lab (Pichora-Fuller & Johnson, 1994, n.d.). To support our argument we will present some data from that study and relate it to what we know of the hard-of-hearing person's everyday life.

Purposes of Communication

To set the context for our discussion, we will briefly describe the functions that language can fulfill—the purposes of communication. Scholars from a variety of disciplines, including anthropology, psychology, education, linguistics, and sociology, have defined functions of communication, which they see as fundamental to explaining culture and describing language in use. The following characterization, based on Halliday and Hasan (1985), illustrates the multidisciplinary interest in this problem.

In his 1923 study of South Pacific islanders, anthropologist Bronislaw Malinowski categorized the uses of language into two broad types: pragmatic (or practical) and magical (or ritual), with the pragmatic function further subdivided into active (language that accompanied and facilitated activities) and narrative. Concentrating on individuals rather than cultures, psychologist Karl Bühler (1934) classified language functions into the categories (a) expressive, or self-oriented, language; (b) conative language, directed toward the listener; and (c) representational language, oriented towards everything else, exclusive of speaker and listener. Educator James Britten (1970) adapted Bühler's framework to describe the development of writing, proposing transactional, expressive, and poetic functions. Philosopher Desmond Morris (1967) divided language into four functions: (a) information, specifically the cooperative exchange of information; (b) grooming, similar to Bühler's and Britten's expressive functions; (c) mood, the play and aesthetic function; and (d) exploratory, designating social, or phatic communication—"the meaningless, polite chatter of social occasions" (Halliday & Hasan, 1985, pp. 15-17). Linguist Michael Halliday, who provided this overview, developed a theory of grammar based on the information and interpersonal functions and a third, textual, function.

Despite the different categories and terminology, all four frameworks focus on three main functions:

1. an informative, or content-oriented function;
2. an interactional function, where language is used to control other people, establish social solidarity, and express the self;
3. a poetic or aesthetic function (less well defined).

For our purpose of dealing with day-to-day North American conversational encounters, we focus on the first two functions, which, following discourse analysts Gillian Brown and George Yule (1983), we call *transactional* and *interactional*, respectively. Most talking fulfills both of these functions to some degree—that is, any given utterance is likely to convey at least some information and express at least some degree of personal attitude and personal relation—so the division into these categories is somewhat artificial. However, most instances of language use can be described as *primarily* fulfilling one of these functions. For example, giving a lecture, asking for or giving directions, making a report, and describing a procedure are all primarily transactional. At the other extreme, exchanging greetings, expressing sympathy, extending congratulations, and just passing the time of day with a familiar friend are primarily interactional.

In spite of the fact that language has more than one major function, a focus on the transactional function is, in Brown and Yule's words, "well embedded in our cultural mythology" (1983, p. 2). We think, with our everyday minds, that language is about facts, expressing knowledge, and exchanging information. To give a specific example, if we ask what a question is, or why people ask questions, the intuitive answer is "to get information." In fact, an analysis of the actual uses of questions reveals many different functions, a number of which do not involve new information at all. This can be seen in the great number of questions that get asked where the questioner knows the answer and the designated answerer knows the questioner knows, as in "Where did these dirty footprints come from?" Other questions, such as "Why don't we have lunch some time?" and "Why do you insist on wearing that awful colour?" clearly are not asked for the purpose of obtaining information. This is one small demonstration that much talk is really about negotiating relationships, expressing solidarity and connectedness, saving face, and other social functions.

To summarize, language serves several major, equally important functions, including transactional (information exchange) and interactional (expression of social connectedness). Our cultural bias is to focus on only one of these, the transactional function. We see this bias in our attitude toward language and—important for cases like the one we describe in the next section—the ways we measure and attempt to remediate hearing impairment. This bias exists despite the fact that "it is clearly the case that a great deal of

everyday human interaction is characterised by the primarily interpersonal rather than the primarily transactional use of language" (Brown & Yule, 1983, p. 3).

The Case of One Hard-of-Hearing Individual

The case presented here is an example of where traditional clinical and laboratory measures leave off, and where we believe a more sociolinguistic approach to appreciating hearing disability and handicap might begin. GK is an 80 year-old hard-of-hearing woman. She is a monolingual native-English speaker with 19 years of formal education. A trained musician, she was employed for much of her life as a singing teacher. She has lived in many provinces in Canada and now lives alone in her own apartment in an affluent area in Vancouver. She is in regular contact with her extended family and enjoys interacting with her grandchildren.

Because she came to UBC to participate in cognitive psychology experiments, we have some measures of cognitive ability that would not usually be part of an audiology record. On a vocabulary test designed to differentiate among normal adults (Raven, 1938), where graduate students score on average 14/20, GK scored 19/20. Her ability to remember read material in a working memory test was also as good as that of university students (Daneman & Carpenter, 1980). These results suggest that her cognitive abilities are excellent and available to support language processing.

Measures of Hearing Impairment, Disability, and Handicap

GK's audiogram confirms that she has a moderate sensorineural hearing loss in both ears. Given this hearing loss, much of the speech signal would be inaudible. Despite this very significant degree of *impairment*, GK has never worn a hearing aid. In fact, it seems she has never even considered wearing one. She had never even had her hearing tested in a clinic before participating in the study reported here.

We also administered the SPIN test (see Pichora-Fuller, this issue) to test GK's ability to repeat sentence-final words heard in high- and low-context sentences presented in a range of signal-to-noise conditions. GK performed much like other hard-of-hearing seniors on this test (also see Pichora-Fuller, Schneider, & Daneman, 1995). Importantly, these results provide evidence that GK does as well as she does in adverse listening conditions because she draws heavily upon context for support. Therefore, we assume that most listening would be much more effortful for her than it would be for a young normal-hearing listener. That is, compared with young listeners with normal hearing, it would be more mentally demanding for her to communicate if she were trying to hear every word.

GK's responses on the *Hearing Handicap Inventory for the Elderly* (Ventry & Weinstein, 1982) show that she is honest in answering questions concerning the detection of sound, insofar as she reports that she does not, in fact, "hear" well. For example, she answered "yes" to the question, "Do you have difficulty hearing when someone speaks in a whisper?" Nonetheless, she answers that she is not bothered emotionally or affected socially by her hearing loss. For example, she answered "no" to the following three questions: (a) Do you feel handicapped by a hearing problem? (b) Does a hearing problem cause you to feel frustrated when talking to members of your family? and (c) Does a hearing problem cause you to attend religious services less often than you would like?

The Topicon Task

GK participated in two conversations in different levels of background noise. She and a rehabilitative audiologist talked for five to 10 minutes on a topic selected by the audiologist from a predetermined list (Erber, 1988). In a modification of Erber's protocol, for each topic of conversation, the audiologist had prepared 10 personal facts that could not be known from world knowledge (Pichora-Fuller & Johnson, 1994; n.d.). For example, in a conversation about cats, one fact was that the audiologist's cat sleeps on her telephone answering machine. (Also see examples (1) and (2) below.) These facts were embedded in the conversation as naturally as possible. GK heard competing multitalker babble under earphones (hereafter referred to as *noise*). A conversation about cats was conducted in 40 dB HL of noise, a level that had not posed major problems for GK in the test using the SPIN materials. Another conversation, about restaurants, was conducted in 50 dB HL of noise, a level that should have been almost impossible for GK, given her performance on the test using the SPIN materials. The apparent fluency of the conversation totally fooled the audiologist, an experienced clinician who can usually tell when listeners are understanding; five minutes into the conversation, in an attempt to try to create communication breakdowns, the clinician actually increased the noise level by another five dB to 55 dB HL. No visual cues were available. Conversations were audiotaped.

Comprehension Measures

In this section we report three of five comprehension measures completed by Pichora-Fuller and Johnson (n.d.). The first measure was a postconversation verbal protocol, in which GK was interviewed about how she thought the conversation had gone. The second was a recognition recall test. Ten multiple-choice recognition questions, each with five candidate answers, were constructed to test the facts that

had been planted in each conversation. The third measure was a detailed discourse analysis of the tape recording of the conversation. We selected discourse measures that we thought would reveal how the talkers controlled the flow of the conversation and the degree to which GK understood what the clinician said.

Verbal protocol. When interviewed, GK told the audiologist that she had understood 100% of the conversation about cats, and that it was not very effortful (with effort rated 2 on a scale of 10). In contrast, she reported understanding about 50% of the restaurant conversation, during which listening was very effortful and hard to follow (8 on a scale of 10). In the noisier restaurant conversation, GK reported having to strain to listen, and that the noise interfered with her hearing and was annoying, frustrating, and mentally distracting. She said she had had to ask more than once for information to be repeated, but that sometimes she had pretended to hear.

Recognition recall test. Her responses to the multiple-choice questions indicated that GK in fact understood much less than she claimed to have understood in the cat conversation. She scored 6 out of 10 questions correct (chance level), thereby contradicting her verbal protocol report that she had understood 100% of that conversation. She scored 4 correct out of 10 questions about the restaurant conversation, so again, she scored slightly lower than would be predicted by her report in the verbal protocol, in which she said that she had understood 50%.

Without knowing the answers that GK gave on the test, a discourse analyst predicted—based on analysis of the portion of the discourse concerned with each planted fact—whether or not GK had understood enough to be able to correctly answer each multiple-choice question. To illustrate, two questions about the restaurant conversation, preceded by the relevant portion of the conversation, are shown here:

1. **Clinician:** When we go to restaurants, I like ordering unfamiliar dishes so I can get ideas for things I can cook at home myself.

GK: Well...I don't know. (3 sec. pause) The problem is if you get too far from home...then you've got to come all the way back again after you're finished and...if you're older, you don't like being out alone too late at night.

Question: I like ordering new dishes because
a. I get bored with the same thing all the time.
b. it's a better test of the cook.
c. I get new recipe ideas.
d. I feel I am getting more for the money.
e. what was good once is often disappointing the second time.

2. **Clinician:** Well, my husband's a big pizza fan, so [going out in the rain] wouldn't stop him from ordering a pizza.

GK: Well...I used to like pizza, but as you get older you have to be careful what you eat.

Question: My husband's favourite food is:
a. Chinese food.
b. pizza.
c. steak.
d. Big Macs.
e. pasta.

For the question in example 1, the discourse analyst correctly predicted that GK's response would be incorrect: GK chose response a. The analyst also correctly predicted GK's correct response b to the question in example 2. But for two facts in the restaurant conversation and one fact in the cat conversation, the discourse analyst predicted that GK had understood facts for which she did not get the multiple-choice question right; even with the benefit of detailed discourse analysis, another "expert" was fooled by GK. On the other hand, for each of the conversations, the analyst predicted that GK had not understood one fact that she *did* recognize correctly on the multiple-choice test. This is consistent with the number of answers that GK could have selected correctly simply by guessing; perhaps the discourse analyst was right, and the multiple-choice test actually overestimated how many facts GK had understood.

Discourse analysis. Additional insights emerged after we conducted a detailed discourse analysis of the entire conversations. For discussion of this analysis, we have divided our measures into those that relate to the flow of information in the conversation and those that relate more directly to the content.

Control of flow. Basic measurements included number of clauses and number of turns, as well as the total time each conversation lasted, which allowed us to calculate rate of information exchange in clauses per minute, turns per minute, and clauses per turn, as well as to determine the between-speaker balance of turns and amount of talk. *Acknowledgment-only turns* are turns such as "uh huh" or "oh yes," with no additional propositional information; these were separated out in the analysis because they do not contribute any new information to the conversation. Note that the restaurant conversation was analyzed as two separate conversations, corresponding to the portions carried on at the two different noise levels. Results are shown in Table 1.

The number of turns was equally distributed across the speakers, as would be expected in a cooperative conversation. Failure to take a turn (when, for instance, KF [the

Table 1. Measures of Flow Control

Conversation topic	CATS		RESTAURANTS			
Babble level	40 dB		50 dB		55 dB	
Total time (minutes:seconds)	9:11		5:4		10:41	
Talkers	KF	GK	KF	GK	KF	GK
Number of turns						
Total turns	23	22	24	23	55	53
Acknowledgment-only turns	2	4	1	4	12	21
Number of clauses						
Total clauses	64	126	46	60	95	125
Acknowledgment-only clauses	2	4	1	4	12	21
(% Nonacknowledgment clauses)	(97%)	(97%)	(97%)	(98%)	(87%)	(80%)
Amount of information per turn						
Total clauses per turn	2.8	5.7	1.7	2.6	2.1	2.4
Clauses/nonacknowledgment turn	3.0	6.8	1.7	3.0	1.9	3.3
Turn-taking rate						
Total turns/minute	4.9		9.9		10.1	
Nonacknowledgment turns/min.	4.3		8.9		7.0	
Rate of information exchange						
Total clauses per minute	20.7		20.9		20.6	
Nonacknowledgment clauses/min.	20.0		19.9		17.5	

clinician] stopped talking, then resumed talking after a pause when GK did not take a turn) may indicate the listener's lack of comprehension, or even failure to hear/ understand that a turn "transition-relevance place" (Sacks, Schegloff, & Jefferson, 1974) had occurred in the conversation. It is interesting to note that the balance in turn distribution (along with the infrequent occurrence of silent gaps) contributed to the impression that a fluent conversation was taking place—an impression that prompted KF to raise the background noise level five minutes into the restaurant conversation.

Although the actual rate of speaking (clauses per minute) remained the same across the noise conditions, speaking turns changed more frequently as noise increased. That is, the number of turns per minute increased, partly due to each speaker taking shorter turns (saying fewer clauses), and partly due to an increase in the number of turns that were simple acknowledgments, turns that are inherently short. Importantly, the rate of exchange of real information (clauses that were not simple acknowledgments) decreased as noise increased.

Control of content. We also looked at measures that might reveal how the speakers controlled the information content of the conversation. Some of these measures are shown in Table 1. Each clause roughly counts as a single unit of information. Thus, we see that both KF and GK packaged fewer units of information in each turn as the noise level increased. Noise also reduced the relative amount of information-bearing talk; as the noise increased from 50 dB to 55 dB, the number of turns that were simple acknowledgments increased, decreasing the proportion of clauses that were information bearing. In addition, noise affected the relative amount of information contributed by each speaker. Although GK spoke more than KF in each conversation, the degree to which this was true changed dramatically as the noise level increased. In the conversation about cats (40 dB noise), GK produced twice as many clauses as KF. At a noise level of 50 dB, the ratio of number of GK's clauses to number of KF's clauses was 1.5:1, and at 55 dB, it was close to 1:1. In addition, relatively fewer of GK's clauses contributed new information at the highest noise level.

Additional measures of content control are presented in Table 2. These include number of major topic shifts, as an indicator of discontinuity in conversation. A speaker may change the topic in order to control the conversation. KF's topic changes mainly served to (a) start each conversation, and (b) introduce her "planted facts." GK's topic changes frequently indicated that she had not heard KF's prior turn

properly, as shown in example 1. KF's topic changes were relatively stable over the three conversations, reflecting the reasons for these changes, which remained constant. On the other hand, GK's topic changes increased markedly as noise level increased and as her comprehension decreased. (Recall that the conversations in noise presented at 40 dB and 55 dB were approximately the same in duration, both twice as long as the conversation in noise presented at 50 dB.)

Table 2. Measures of Content Control

Conversation topic	CATS		RESTAURANTS			
Babble level	40 dB		50 dB		55 dB	
Speakers	KF	GK	KF	GK	KF	GK
Topic shifts	5	2	6	4	8	12
Feedback						
Acknowledgment	2	4	1	4	12	21
Backchannel	8	_	5	1	11	1
Gap > 3 sec	1	_	1	2	_	3
No Response	_	_	_	_	_	_
Overlap	1	1	1	1	_	_
Comment on Hearing	_	_	_	_	_	3
Questions						
Information	3	1	2	1	3	1
Clarification	_	_	_	2	2	1

Management of information is also indicated by the kind of feedback a conversational partner provides and how this feedback is timed. Acknowledgments, whether they are given as full turns (when the first speaker has yielded the floor) or as backchannel responses (when the first speaker continues her turn and the backchannel provider does not try to take the floor; see Mey, 1993), give the first speaker permission to continue her turn and her topic. Acknowledgments may not be true indicators of comprehension; their lack of propositional content means they can be offered to keep the conversation going, whether or not a listener has understood what was just said. It is interesting to note that KF, but not GK, provided backchannel responses, and that both speakers' (but particularly GK's) acknowledgment turns increased dramatically in noise presented at 55 dB, as previously noted.

Noticeable gaps between turns (which we somewhat arbitrarily defined as periods of silence exceeding three seconds) and turn overlaps provide a way to consider turn timing, as a marker of information transfer. Long gaps are one (not entirely trustworthy) indication that information transfer has failed; a listener who has not heard may not know what to say next, so may not speak at all. Overlaps must be treated with caution, because they can occur due to a number of factors, including individual and culturally determined speaking style. But they can also mark points in a conversation where information transfer may fail; if speakers overlap, even otherwise audible information may be lost. Frequent overlaps may indicate that a speaker cannot hear well enough to determine transition-relevance places, so speaks at inappropriate moments. On the other hand, in challenging listening conditions, conversationalists may focus on nonverbal turn-boundary cues (changes in eye gaze, body orientation, loudness and rhythm of speaking) to minimize overlap and so avoid loss of information. In the conversations analyzed, there were few gaps (though GK had several at the two higher noise levels) and few overlaps (none at the highest noise level).

Two final measures of content control are speakers' use of questions and indications of failure to hear or understand. In our coding, we differentiated between information and clarification questions. These question types are distinguished by the domain they query: information questions solicit new information about the world, while clarification questions query what was just said by the prior speaker. A clarification question must be answered before the conversation can continue. A speaker can use information questions to either maintain a topic and conversation (by encouraging the conversational partner to continue and elaborate) or—important for hard-of-hearing individuals—to take control of the conversation, frequently by changing the

topic. In view of these functions, it is interesting that the frequency and distribution of questions did not change across the conversations. Overall, both speakers asked very few questions.

Indications of failure to hear can take the shape of comments about not having heard or requests for clarification (as well as nonverbal cues, which were not available in the experimental situation). In either case, the comment or question interrupts the main strand of conversation with what is sometimes called a *side sequence* (Jefferson, 1972); after a side sequence has been completed and the conversational breakdown has been repaired, the speakers take up the conversation where they left off. Considering the two categories together, GK made few attempts to repair the conversation, with a maximum of three comments about not hearing and one clarification question in the most difficult listening condition (see Table 2). Interesting in view of other indications of her failure to hear, this result is consistent with GK's report that she sometimes pretended to hear.

Conclusions

Assuming that KF's voice was at a typical conversational level of 50 dB HL, the signal-to-noise (S:N) conditions in the conversations were +10, 0, and -5 dB S:N. As the S:N ratio dropped, GK's self-reported comprehension dropped from 100% to 50%, and her recognition recall test score dropped from 60% to 40%. Given the results for word identification in noise, and the fact that GK heard so little of the speech signal in the adverse conditions, it is very surprising that comprehension was preserved even to the extent that it was.

GK seemed to *comprehend* about half of what was said when she should have been *hearing* almost nothing. The surprising preservation of comprehension seems consistent with GK's reported increase in effort of listening. As comprehension dropped, listening effort increased from 2 to 8 on a scale of 10. If listening is effortful and becomes mentally taxing, then comprehension should decrease. The expected drop in comprehension may possibly have been offset either by the benefit realized from supportive conversational context and/or by adjustment in the rate of flow of information to keep it within limits that did not exceed available working memory resources (see Pichora-Fuller, this issue). Discourse analysis provides evidence that talkers and listeners do actively control the flow of information to their advantage.

Another surprising feature of the conversation is that it remained very fluent despite GK's decrease in comprehension. An issue raised by the subject's admitted strategy of pretending to understand concerns the social value of trading conversational fluency for accuracy of comprehension. To satisfy the goals of social interaction, the amount of information understood may be sacrificed in favour of maintaining an acceptable flow of information. GK's failure to request clarification in conversations where independent measures demonstrated her lack of understanding supports this interpretation. We do not know how many interruptions conversational partners can tolerate before they lose their sense of a fluent, coherent interaction; GK appears to be very sensitive to this possibility.

Perhaps impairment and handicap measures are so poorly correlated because impairment measures relate better to problems of information exchange, whereas handicap measures may relate to problems of either information exchange or social interaction. The goals of hard-of-hearing listeners must be known before clinicians will ever be able to appreciate more about handicap.

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References

Britton, J. (1970). *Language and learning*. Harmondsworth: Penguin.

Brown, G., & Yule, G. (1983). *Discourse analysis*. Cambridge: Cambridge University Press.

Bühler, K. (1934). *Sprachtheorie: die Darstellungsfunktion der Sprache*. Jena, Germany: Fischer.

Daneman, M., & Carpenter, P.A. (1980). Individual differences in working memory and reading. *Journal of Verbal Learning and Verbal Behavior, 19*, 450-466.

Demorest, M.E., & Erdman, S.A. (1987). Development of the communication profile for the hearing impaired. *Journal of Speech and Hearing Disorders, 52*, 129-143.

Erber, N.P. (1988). *Communication therapy for hearing-impaired adults*. Abbotsford, Australia: Clavis Publishing.

Halliday, M.A.K., & Hasan, R. (1985). *Language, context, and text: Aspects of language in a social-semiotic perspective*. Oxford: Oxford University Press.

Jefferson, G. (1972). Side sequences. In D. Sudnow (Ed.), *Studies in social interaction* (pp. 294-338). New York: Free Press.

Malinowski, B. (1923). The problem of meaning in primitive languages. In C.K. Ogden & I.A. Richards (Eds.), *The Meaning of Meaning* (Supplement 1). International Library of Philosophy, Psychology and Scientific Method. London: Kegan Paul.

Mey, J. (1993). *Pragmatics: An introduction*. Oxford: Blackwell.

Morris, D. (1967). *The naked ape*. London: Jonathan Cape.

Noble, W. (1983). Hearing, hearing impairment, and the audible world: A theoretical essay. *Audiology, 22*, 325-338.

Pichora-Fuller, M.K., & Johnson, C. (1994). Conversation in noise: A comparison of comprehension measures. *ASHA, 35*, 243.

Pichora-Fuller, M.K., & Johnson, C. (n.d.). Comprehension in noise: A comparison of comprehension measures. Manuscript submitted for publication.

Pichora-Fuller, M.K., Schneider, B., & Daneman, M. (1995). How young and old adults listen to and remember speech. *Journal of the Acoustical Society of America, 97*, 593-608.

Raven, J.C. (1938). *The Mill Hill Vocabulary Scale*. London: Lewis.

Sacks, H., Schegloff, E., & Jefferson, G. (1974). A simplest systematics for the organization of turn-taking in conversation. *Language, 50*, 696-735.

Tye-Murray, N. (1991). Repair strategy usage by hearing-impaired adults and changes following communication therapy. *Journal of Speech and Hearing Research, 34*, 921-928.

Tye-Murray, N. (1994). Communication strategies training. In *Research in audiological rehabilitation: Current trends and future directions*, J.-P. Gagné & N. Tye-Murray (Eds.), *Journal of the Academy of Rehabilitative Audiology, Monograph Supplement, 27*, 193-207.

Ventry, I., & Weinstein, B. (1982). The Hearing Handicap Inventory for the Elderly: A new tool. *Ear and Hearing, 3*, 128-134.