Conversational Moves and Conversational Styles of Adult Cochlear-Implant Users

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One purpose of this investigation was to determine whether adults with significant hearing impairments typically recognize the occurrence of a communication breakdown, and if so, whether they are usually able to rectify the breakdowns. A second purpose was to develop a model, in a preliminary way, of three conversational styles of persons with hearing impairment. Nine adult cochlear-implant users engaged in spontaneous conversation with naive communication partners who did not know about their hearing impairments. The interactions were videotaped, orthographically transcribed, and coded. Subjects usually recognized when they did not understand a message and then used repair strategies. Most commonly, they asked "what?" or "huh?", or used a non-verbal body gesture. Communication partners' most common response to these non-specific repair strategies was a verbatim repetition of the original message. Three conversational styles are described: interactive, passive, and aggressive. Persons with hearing impairment might display a constellation of behaviors typical of one or more of these styles.

Many investigators involved with audiologic rehabilitation have defined communication breakdowns as instances in which persons with hearing impairment do not recognize spoken messages (Erber, 1988; Gagné, Stelmacovich, & Yovetich, 1991; Gagné & Wyllie, 1989; Tye-Murray, 1994). In a previous investigation

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(Tye-Murray, Witt, & Schum, 1995), adult cochlear-implant users engaged in conversations with normal-hearing individuals who were either familiar to them, or who were unfamiliar but aware of their hearing impairment and accustomed to speaking to individuals who have hearing impairment. The conversations were examined to determine the types of repair strategies individuals use after recognizing the occurrence of a communication breakdown. The analyses revealed that cochlear-implant users most commonly asked "what?" or "huh?". Three repair strategy-response adjacency pairs, summarized in Table 1, were identified. An adjacency pair is a linked interchange in which a talker's utterance invites a particular response from the conversational partner (Schegloff & Sacks, 1973). For instance, when someone asked, "what?" the communication partner most often repeated the original message verbatim (identified as the *nonspecific repair strategy-message repetition response adjacency pair*).

One purpose of the present investigation was to verify and extend the results

Table 1

Repair Strategy-Response Adjacency Pairs Identified
in Tye-Murray, Witt, and Schum (1995) (CI = cochlear implant)

Repair strategy-response linked adjacency pairs
A. Nonspecific repair strategy – message repetition response. – When a CI user implements a non-specific repair strategy following a communication breakdown, the communication partner typically repeats the original message. *Partner:* "Are the rest in Clinton?" *CI:* (shakes his head with a confused look) *Partner:* "Are the rest in Clinton?"
B. Request for information repair strategy – provide information response. – When a CI user requests specific information, the communication partner typically provides it. *Partner:* "I work in the Oto clinic down the hall." *CI:* "The what clinic?" *Partner:* "Oto clinic."
C. Confirmation repair strategy – feedback response. – When a cochlear-implant user restates the message content, the communication partner typically either confirms or corrects the statement. *Partner:* "I have two children." *CI:* "Two children?" *Partner:* (nods)

Note. From "Effects of Talker Familiarity on Communication Breakdown in Conversations with Adult Cochlear-Implant Users" by N. Tye-Murray, S. Witt, and L. Schum, 1995, *Ear and Hearing, 16,* 459-469. Copyright 1995. Adapted by permission.

of Tye-Murray et al. (1995) by determining whether the linked adjacency pairs are evident when communication partners are inexperienced with talking to persons who have hearing impairment. Individuals with hearing impairment frequently interact with those who are not familiar with hearing loss, for example, store clerks, bank tellers, and/or restaurant personnel. In this investigation, inexperienced communication partners were recruited to provide subjects with more typical real-world interactions. We also determined whether individuals who are hearing impaired typically recognize the occurrence of a communication breakdown, and if so, whether they are likely to attempt rectification and whether their efforts are typically successful.

Tye-Murray et al. (1995) identified a host of conversational strategies used by cochlear-implant users, strategies apparently meant to minimize the occurrence of communication breakdowns. These strategies included taking longer speaking turns, interrupting more, using fillers, and avoiding the use of questions (see also Erber, 1988; Erdman, Crowley, & Gillespie, 1984; Hall, 1984; Hallberg & Carlsson, 1991; Meadow-Orlans, 1991). Some subjects also occasionally responded to their partners' remarks in a way that caused the topic of conversation to shift toward one that they could possibly dominate, as in the following example:

> *Partner:* "I have three brothers."
> *Subject:* "Oh."
> *Partner:* "And they live all over the place, so –"
> *Subject* (interrupting): "Well, I have one brother who spent 30 years in the army, he's a colonel now, he's retired, he lives down in ah . . . oh . . . South Carolina. A city in South Carolina they moved, a beautiful home on a lake down there."

In this interchange, the subject did not respond to the partner's remarks, and shifted the topic of conversation so that it focused on one that was familiar to her.

The profile of persons with significant hearing difficulties that emerged from these results was one of domination and non-interaction. Subjects may have controlled their conversations and allowed little opportunity for their (unfamiliar) partners to play an equal role in a conversation's development. Although this profile may fit some individuals, our clinical experience, and that of other authors, suggest that some individuals may behave differently. For instance, Kaplan, Bally and Garretson (1985) describe three kinds of behaviors that may emerge in response to communication difficulties: (a) passive, (b) aggressive, and (c) assertive. A person who often uses passive behaviors may have a tendency to withdraw from conversation, for example, by bluffing and pretending to understand. A person who often uses aggressive behaviors may exhibit hostility toward the conversational partner, and display a "bad attitude." People who use assertive behaviors express their communication needs, while still respecting the rights and needs of their partners (Kaplan et al., 1985).

A second purpose of this investigation was to expand on a model that characterizes three conversational styles of persons who have significant hearing impairment. A preliminary attempt was made to identify constellations of behaviors that may be used during conversations with normal-hearing strangers.

In summary, the purposes of this investigation were: (a) to determine whether adults with significant hearing impairments typically recognize communication breakdowns and if so, whether they rectify the breakdowns successfully; (b) to verify repair strategy-response adjacency pairs; and (c) to expand on a model that characterizes three conversational styles of persons with hearing impairment.

METHODS

Cochlear-Implant Subjects

Nine Clarion cochlear-implant users, 3 males and 6 females, served as subjects with hearing impairment (see Table 2). For purposes of data analysis and reporting, they were assigned an identification number preceded by the letters "CI." Subject ages ranged from 28 to 77 years, with a mean of 53.6 years (SD = 19.2). Duration of implant use was 12 months, with the exception of 1 subject (CI6), who had a duration of 6 months. All subjects were adventitiously deafened and none had significant speech intelligibility deficits. All subjects live in Midwestern states and are Caucasian, so share some regional and ethnic cultures. Three subjects (CI1, CI2, and CI8) lived alone and 3 subjects (CI2, CI3, and CI9) were retired. Other than CI2, who was both retired and living alone, subjects had regular opportunities to converse with individuals either in the work place or at home (and presumably, opportunities to experience communication breakdowns and to use repair strategies).

On the same day that subjects participated in the present experiment, they also completed the Iowa Laser Videodisc Sentence Test (Tyler, Preece, & Tye-Murray, 1986) in an audition-only condition, presented at a level of 73 dB SPL. On average, the CI subjects scored 51.3% words correct (SD = 41.5). These results suggest that subjects experienced listening difficulties, and that the potential for communication breakdowns to occur during conversation was present.

Communication Partners

Nine paid volunteers recruited from the University of Iowa Hospitals and Clinics served as the communication partners. Ages ranged from 20 to 50 years, with a mean of 31.3 years (SD = 11.9). The communication partners were female Caucasians who reside in Iowa and are native speakers of English, and were free of any speech, language, hearing, and neurological problems. Although subject criteria did not exclude males, only females responded to an advertisement placed in a hospital news flyer. Criteria for participation included having no immediate family member with a hearing loss nor having had contact with an individual with

Table 2

Demographic Data for the Cochlear-Implant (CI) Subjects

Subjects	Gender	Age (years)	Duration of CI use (months)	Occupation	Number of persons living in household	Score on the Iowa Laser Videodisc Sentence Test audition-only (%words correct)
CI1	M	30	12	Teacher	1	99
CI2	F	76	12	Retired	1	25
CI3	M	77	12	Retired	2	5
CI4	F	28	12	Teacher	3	99
CI5	F	42	12	Clerk	4	78
CI6	F	57	6	Dance Teacher	2	6
CI7	F	44	12	Internal Auditor	3	55
CI8	F	53	12	IRS Tax Examiner	1	90
CI9	M	75	12	Retired	2	5
Mean		53.5	11.3		2.1	51.3
(SD)		(19.2)	(2.0)		(1.1)	(41.5)

a hearing loss more than once a month. To ensure this, but yet to maintain the integrity of this study, an interview consisting of eight questions was conducted during the recruitment process. The following question, "Do you ever converse with disabled individuals? If so, what type?" was asked to exclude any individuals who may have had experience conversing with an individual who was hearing impaired. Communication partners were told during recruitment that this was a study of communication and that they would be asked to have a conversation with an individual that they did not know. The interaction would take place in a room where conversation would be difficult due to some type of background noise, and the interaction would be videotaped. The communication partners were assigned the same identification number as the CI subject with whom they interacted, preceded by the letters "CP."

Experimental Procedures

CI subjects were randomly assigned a communication partner. Both the CI subject and the communication partner were seated behind a table, next to one another. Classical music was played to induce conversational difficulties. The music was calibrated at the level of the CI subject's headpiece and set to measure 63 dB SPL at its loudest point. Music was played from an audiotape on a Sony Stereo Cassette Deck TC-K670 and through a Crown D-75 amplifier. Members of a CI/CP pair were told to introduce themselves and to simply get to know one another. Five 3×5 in. topic cards were provided to help initiate conversation if difficulties occurred. The length of the conversations varied from 5 to 10 min with an average of 8.7 min. Participants did not know beforehand how long the interaction would last, so they would not monitor their watches. Each interaction was videotaped. The camera view consisted of the top of the table and the upper body of each participant. The clinician left the room during the videotaping.

The CI subjects were told that this was an exercise to determine how well they could understand conversation while background music played. They were also told they would interact with an individual they did not know and this individual was not informed about their hearing loss. Thus, CI subjects had the option of either disclosing or not disclosing their hearing impairment.

The CP subjects were informed that this was a study to determine how communication styles differed between individuals. CP subjects were also told that communication behaviors would not be rated as *right* or *wrong,* or *better* or *worse.*

Coding

Each videotaped interaction was orthographically transcribed and coded by the second author. The interactions were coded for: (a) number of communication breakdowns, (b) whether or not the occurrence of communication breakdown was recognized by the CI subject and whether it was successfully resolved, (c) type

of repair strategies used by the CI subject, (d) response of the communication partner to the CI subject's first request for repair, (e) number of questions asked, (f) number of fillers used, (g) number of interruptions, (h) mean length of speaking turn, and (i) whether or not the CI subject abruptly shifted the topic of conversation to one that they were familiar with at least once during the conversation. Both authors looked at the coded transcripts on separate occasions and then together watched all of the videotaped interactions to verify the assigned codes. If there were any disagreements, the data were not included.

Following Caissie and Rockwell (1993) and Tye-Murray et al. (1995), communication repair strategies used by the CI subjects were coded by whether individuals: (a) requested specific information by either asking the communication partner to repeat all or a part of the original message (the *request for specific information* repair strategy); (b) confirmed the message by repeating what he or she heard (the *confirmation* strategy); (c) said "what?", "huh?", or "pardon?" (the *what/huh/pardon* strategy); or (d) indicated a misunderstanding by a nonverbal body movement such as a shoulder shrug (a *nonverbal* repair strategy).

The verbal responses of the communication partners were coded by whether individuals: (a) repeated the message verbatim or changed only one or two words in the original message (*repeat message* response); (b) restructured the message with many new words and/or new syntax (*restructure* response); (c) reduced the original message by eliminating words or phrases from the original message (*reduction* response); (d) provided feedback such as a confirming head nod (*feedback* response); (e) provided the requested information (*information* response); (f) elaborated upon the original message (*elaboration* response); or (g) did not repair because they did not recognize that a repair strategy was being used, gave up trying to rectify the breakdown, or did not feel it was worth the effort (*no repair*).

Mean length of speaking turn (MLT) and a number of conversational moves were also coded for each conversational interchange. The additional conversational moves consisted of the number of questions, fillers, and interruptions used by both the CI and the CP subjects, and whether or not CI subjects abruptly shifted the topic of conversation back to one with which they were familiar. MLT was computed by taking the average number of words per speaking turn for 50 consecutive turns spoken by both the CI subjects and the CP subjects. MLT counts were taken after the first 20 utterances of each interaction. The number of questions asked by both individuals was tallied. Questions read from the topic cards and questions asked during the repair of a communication breakdown were not included. Fillers were classified under two categories, verbal and non-verbal. A verbal filler consisted of an abnormally extended "mmmm" or "ahhhh" or any non-English word such as "uhm." A non-verbal filler consisted of an extended pause in the middle of an utterance, for example, "I was . . . overseas fighting in the war." Interruptions were defined as abrupt initiations of conversation that caused the individual who was previously talking to stop. Overlaps in conversa-

Table 3

Length of Conversation, Total Number of Communication Breakdowns, Average Number of Repair Attempts, and Whether or Not the Cochlear-Implant (CI) Subject Informed the Communication Partner (CP) About His/Her Hearing Loss

Subject	Length of conversation (minutes)	Total no. of communication breakdowns	Average no. of repair attempts	CI informs CP about hearing loss
CI1	10	1	0.0	Yes
CI2	10	13	1.0	No
CI3	5	13	1.3	Yes
CI4	6	9	1.0	No
CI5	8	4	1.0	No
CI6	9	18	2.1	No
CI7	10	5	1.0	No
CI8	10	8	1.0	Yes
CI9	10	19	1.8	Yes
Total		90		
Mean	8.7	10	1.1	
(SD)	(1.9)	(6.2)	(0.6)	

tion where one individual began an utterance while the other individual completed an utterance were not coded as interruptions.

RESULTS

Table 3 indicates the length of each conversation, the total number of communication breakdowns, and the average number of repair attempts used per breakdown. In addition, Table 3 indicates whether or not CI subjects informed CP subjects of their hearing loss.

Between 1 and 19 communication breakdowns occurred during each conversation, with an average of 10. In 86% of the breakdowns, CI subjects were aware that an utterance was spoken but did not recognize it. In 64% of such incidents, CI subjects knew that they did not recognize the message, made an effort to rectify the communication breakdown, and eventually were successful in doing so.

On average, CI subjects required 1.1 repair attempts following a communication breakdown. This finding suggests that most communication breakdowns were quickly resolved, and rarely required an extended interchange between the two partners.

Only 4 of the 9 CI subjects informed their partners of their hearing loss. Three of these 4 disclosed the loss at the onset of the conversation, while 1 subject did so after 25 consecutive turns had elapsed, or approximately halfway through his conversation. Following disclosure, an average of 32 conversational turns (for

both CI and CP subjects), or 33% of the remaining conversation, focused on the topic of hearing loss and/or cochlear implants.

The first repair strategies used following a communication breakdown and the communication partners' responses to them are indicated in Table 4. These breakdowns are thus those instances when a CI user realized the occurrence of a breakdown and also attempted to repair it (this happened in 58 of 90 breakdowns). The most commonly used repair strategy was the non-verbal strategy (38%). Confirmations were also used frequently (31% of the breakdowns). CI subjects never used strategies other than those indicated in Table 4, such as "Slow down" or "Say that in a different way." The same repair strategy-response linked adjacency pairs found by Tye-Murray et al. (1995) were evident (see Table 1). Sixty-four percent of the responses to nonspecific repair strategies (i.e., either the what/huh/pardon or a non-verbal repair strategy) were repetitions. Seventy-eight percent of the responses to the request for information repair strategy were the provision of information, and 100% of the responses to the confirmation strategy were the provision of feedback.

The only times that communication partners did not attempt to repair a communication breakdown following a CI subject's use of a repair strategy ($N = 4$) were those times when a CI subject used a non-verbal repair strategy. One possibility is that on at least some of these occasions, the CP subject did not recognize the CI subject's nonverbal signal as a repair strategy.

Table 5 indicates the conversational moves used by both CI and CP subjects and the MLT ratios. Paired comparison *t*-tests indicated that the CP subjects asked significantly more questions than the CI subjects (16.1 vs. 7.4 questions, $t = 2.75$, $p < .02$). Conversely the CI subjects interrupted more frequently (1.3 vs. 0.4 interruptions, $t = -2.29$, $p < .05$). They also tended to use more fillers, although this difference was not significant.

The MLT ratios indicate which member of a conversational dyad took longer speaking turns, with a value greater than one indicating longer turns on the part of the CI subject. On average, the MLT ratio was 1.7, suggesting that the CI subjects spoke more words per turn. However, there were at least three notable exceptions to the group trend. CI5 spoke considerably fewer words per turn than her conversational partner (7.6 vs. 16.3 words), while CI3 and CI4 spoke an almost equal number. Moreover, on average, the MLTs of the CI subjects were not significantly greater than the MLTs of the CP subjects.

As indicated in Table 5, on at least one occasion, 5 CI subjects responded to remarks of their communication partners in a manner that caused the topic to veer off in a direction where they could dominate the topic of conversation. One CI subject, CI2, tended to overlap the CP subject's utterances with her own. This may have been a means to control the conversation and, in this instance, had an unfavorable effect on the fluency of the conversation. CP2 started to talk faster and to rush through her utterances as the conversation progressed and in one in-

Table 4

First Repair Strategy Used by Cochlear-Implant (CI) Subjects After a Communication Breakdown was Recognized and Responses of Communication Partners (CP)

First repair strategy used by CI	CP response							Total no. of breakdowns	Mean *(SD)*
	A	B	C	D	E	F	G		
Request for information	1	1	0	0	7	0	0	9	1.0 (1.5)
Confirmation	0	0	0	17	0	0	0	17	1.9 (2.3)
What/huh/ pardon	7	2	1	0	0	0	0	10	1.1 (1.3)
Non-verbal	7	6	4	0	0	1	4	22	2.4 (3.8)
Total	15	9	5	17	7	1	4	58	1.6 (2.4)
Mean	1.7	1.0	0.56	1.9	0.77	0.11	0.44		
(SD)	(1.6)	(1.0)	(0.9)	(2.3)	(1.4)	(0.3)	(0.7)		

Note. A = repeated original message. B = restructured original message. C = reduced original message. D = provided feedback. E = provided information. F = elaborated original message. G = performed no repair.

Table 5

Number of Questions, Fillers, and Interruptions Used by Cochlear-Implant (CI) Subjects and Their Communication Partners (CP), Mean Length of Speaking Turn (MLT), and Whether or Not CI Subjects Exhibited an Abrupt Topic Change at Least Once During Their Conversation

	Questions		Fillers		Interruptions		MLT[a]		MLT[b]	Abrupt topic
Subjects	CI	CP	CI	CP	CI	CP	CI	CP	ratio	change
CI1	8	11	43	5	1	1	11.7	4.5	2.6	No
CI2	12	5	68	4	2	0	12.4	3.7	3.4	Yes
CI3	3	25	2	6	2	0	6.2	6.3	0.98	Yes
CI4	14	18	23	5	1	2	5.7	6.4	0.89	No
CI5	2	10	5	40	2	0	7.6	16.3	0.47	Yes
CI6	5	13	10	18	2	0	6.2	8.1	0.77	No
CI7	8	16	31	13	0	0	10.1	5.6	1.8	Yes
CI8	13	21	55	14	2	1	10.2	3.9	2.6	Yes
CI9	2	26	5	2	0	0	5.1	2.9	1.8	No
Mean	7.4	16.1	26.9	11.9	1.3	0.44	8.4	6.4	1.7	
(SD)	(4.7)	(7.1)	(24.1)	(11.8)	(0.9)	(0.7)	(2.8)	(4.0)	(1.0)	

[a]MLT = The average number of words per speaking turn for 50 consecutive turns starting after the first 20 utterances. [b]MLT ratio = CI MLT/CF MLT

stance, depicted below, prematurely stopped her own message, allowing CI2 the opportunity to start talking.

CI2: "So I said to her, 'can we pet the, can we pet Sandi?' And she said, 'Well, this really isn't a pet.'"
CP2: "True, it's more of a working . . . " (fades away)
CI2: "So she said, 'we don't like to have her petted.'"

DISCUSSION

In more than half of the communication breakdowns, CI subjects were aware that they did not recognize the message and successfully took steps to rectify the breakdowns. The same repair strategy-response linked adjacency pairs described by Tye-Murray et al. (1995) were evident in this investigation (see Table 1), suggesting that these pairs might emerge in a variety of conversational interactions. Nonspecific repair strategies (i.e., nonverbal and the what/huh/pardon strategy) were also found to be used commonly.

There was some evidence that CI subjects used controlling behaviors. On average, they interrupted more often than the CP subjects, they asked fewer questions, they used more fillers, and they tended to take longer speaking turns. Not surprisingly, some CI subjects departed from these trends, suggesting that not all persons with significant hearing impairments attempt to control their conversations.

In Figure 1, we expand upon the model presented by Kaplan et al. (1985) to

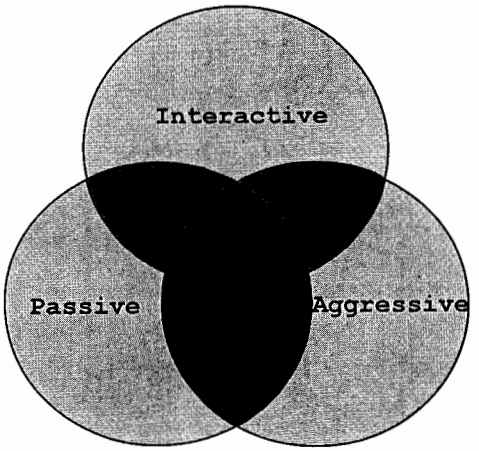

Figure 1. A model to characterize three different conversational styles that may be used by persons with hearing impairment.

characterize three conversational styles of persons with hearing impairment. The model consists of three intersecting constellations of behaviors, labelled *interactive, passive*, and *aggressive*. Persons who fall primarily into the interactive circle demonstrate cooperative conversational behaviors, as described by Wardhaugh (1985) and Grice (1975), among others. These persons share equal responsibility with their conversational partners in developing a topic of conversation and for choosing what to talk about, they do not do all of the talking, and they are interested in what their partners have to say and in responding to their remarks. In this investigation, CI4 most clearly fit into this constellation. She asked almost as many questions as her communication partner, she rarely interrupted, she avoided abrupt topic changes, and her MLT almost matched that of CP4 (MLT ratio = 0.89, see Table 5).

Persons who use behaviors that fall into the passive constellation may bluff and pretend to understand. They may not contribute as much to the development of a topic as their communication partners, and may not help in choosing what to talk about. CI5 exemplified this constellation of behaviors. She asked 2 questions to her partner's 10. Her partner, CP5, used 40 fillers while CI5 only used 5. In the videotape, CP5 frequently paused and nodded expectantly and said, "so . . ." or "hmm . . .," as if she were passing the speaking turn to CI5. When CI5 did not respond, CP5 would talk again. These turn-pass moves were counted as fillers, in accordance with the present coding system. However, in this one conversation, her fillers did not seem to be controlling moves, but rather invitations for CP5 to take a speaking turn which CP5 turned down. The MLT ratio in this conversation was 0.47, with CI5 speaking only about half as many words as CP5 (see Table 5). CI5 also did not make an effort to rectify 50% of her communication breakdowns, suggesting that she did not actively attempt to repair breakdowns.

The final circle in Figure 1 represents behaviors associated with an aggressive conversational style. Behaviors in the constellation include extended speaking turns, interruptions, abundant use of fillers, and use of abrupt topic changes. An individual demonstrating this conversational style may dominate the conversation. CI2 in this investigation demonstrated these behaviors. She asked many questions (12 to her partner's 5), but they tended to be yes-no questions. She often did not acknowledge CP2's responses, because her following remark was rarely contingent upon CP2's response. She used many fillers in a controlling fashion (68 to CP2's 4), and the MLT ratio was 3.4, with CI2 speaking more than three words for CP2's every one. She initiated several abrupt topic changes, and as noted earlier, often overlapped the beginning of her utterances with her partner's endings.

In the model depicted in Figure 1, the three circles overlap because an individual rarely demonstrates only the behaviors of one constellation. A person's conversational style may change during the course of a conversation, as the indi-

vidual begins to feel more comfortable or the dynamics of the interaction are established. Of course, conversational styles may also vary depending on the familiarity of the conversational partner and the circumstances under which the conversation is being conducted.

In future work, we will refine this model by studying a larger number of subjects. It may be worthwhile to quantify the distinguishing behaviors that place specific individuals within the model, perhaps by using an appropriate statistical procedure. We will also attempt to relate speech recognition scores to communication behaviors. For instance, an individual with very poor speech recognition skills may have little interest in conversing with a stranger.

Finally, less than half of the CI subjects (4 of 9) informed their communication partners of their hearing impairment. It is impossible to guess whether the conversations of the 5 who did not would have been easier or more pleasant if they had done so. However, the present investigation suggests one drawback: with disclosure, the possibility arises for the conversation to veer away from more commonplace topics and focus on the hearing loss. Once subjects identified their hearing losses, 33% of the remaining remarks spoken in their conversations focused on the loss or the cochlear implant. If this is typical, a person with hearing loss may surmise that there are some negative consequences in disclosing a hearing impairment, and may be reluctant to do so.

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