Chapter 3

Slipping Through the Timestream: Social Issues of Time and Timing in Augmented Interactions

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In describing the tenor of their interactions, people who rely on means other than mouth-speech for face-to-face communication commonly bring up issues of time and timing. Sometimes the issues relate to how long it takes to get one's body to make all the movements needed to produce a coherent message. Sometimes it is an issue of how good certain interlocutors are in getting into synch with the speaker. Sometimes these issues concern interlocutors not having enough time or patience. Sometimes the issue is one of personal time management and how much time one can afford to spend in face-to-face interaction. Sometimes the issue concerns how and why different means and devices for communication are selected to meet the temporal demands of different contexts. And sometimes there's an issue surrounding normative understandings of the temporal flow of communication and how this can rob some individuals of the ability to say exactly what they want to say when they need to say it. Such concerns bring into sharp relief the fact that there is a significant number of distinct temporal threads that need to be jointly coordinated by all participants for each of them to feel that the interaction was not just a successful one but also a good one. If the joint communicative interaction is seen by one or the other party as a failure due to a temporal coordination problem, then there can be recriminations of communication incompetence that

get launched in each direction. The primary aim of this chapter is to examine some of the distinct temporal threads that are attended to in the communicative interactions of individuals using alternative and augmentative means of communication, and to show how success or failure to meet in the same timestream can result in social evaluations of "competence" or "incompetence" in communication.

We are sympathetic with McDermott and Verenne's (1995) view that: "Disabilities are less the property of persons than they are moments in a cultural focus. Everyone in any culture is subject to being labeled and disabled" (p. 324). We find persuasive their thesis that culture—as an historically evolved pattern of institutions, practices, and values—is the agent that creates a them that is distinct from an us at the very same time it establishes that them and us are participants in one and the same cultural matrix, subject to the same institutional points of reference, and, in our discourse and daily activities, reliant on the same unexamined fabric of sociocultural givens. As Robillard (1994) has so eloquently shown, the "socially consensual order of conversation has a time order" and that time order is a sociocultural creation with its own normative givens, which prohibits the active participation of people, like himself, who are physically unable to produce mouth-speech. As Robillard (1994) states:

> The ordinary forms of conversational participation that generate and sustain a sense of agency are breached when the patient cannot communicate in socially consensual "real time." . . . delayed speech, through the use of an alphabet board, frequently leads to a host of interactional problems and mutual accusations about character. (p. 383)

This chapter expands on Robillard's notion of socially consensual "real time" and demonstrates, following McDermott and Verenne, that for augmented speakers the normative temporal threads (i.e., the standard time order) of communicative interaction in American English-speaking culture can have socially debilitating effects. It is hoped that a more detailed understanding of this problem can help overcome the hegemony of the institutionalized patterns of interaction and can empower people (both augmented speakers and their interlocutors) to find alternative time orders for communication that fit their needs and situation.

In this chapter we examine first some of the ways in which time and timing operate within face-to-face interaction, based on the recent work of Herbert Clark (1996). Then our attention focuses on individuals whose ability to produce mouth-speech and other conventional forms of communication is compromised by their physical disabilities; we examine the types of constraints on time and timing that these individuals and their inter-

locutors encounter when their interactions are augmented by various communication technologies. Through the scientific literature, first-person accounts, and an observational case study, we extend Clark's framework to the interactional problems faced by augmented speakers and their interlocutors.

TEMPORAL ASPECTS OF COMMUNICATIVE INTERACTION

In his recent major work, Clark (1996) argues that language use is a species of joint action. As such, language use cannot be reduced to autonomous actions of the individual participants, but has to be treated as a coordinated set of participant actions designed and deployed for jointly carrying out social activities. In such a perspective, time and timing issues have to be treated as issues that simultaneously involve speakers and addressees. Moreover, any problems in communication are located in the joint action, not in autonomous acts or individuals. To clarify this position, consider the following (Clark, 1996):

> Speakers' actions in talk aren't independent of their addressees' actions, or vice versa, and that goes for their problems as well. When speakers need extra time to plan an utterance, that isn't their problem alone. The time they need belongs to them and their addressees together, so they have to coordinate with their addressees on the use of that time. . . . Most problems in using language are *joint* problems, and dealing with them requires *joint* management. (p. 266)

When I am communicating, what I do in my time is also done in my interlocutor's time, and vice versa, and we both have to be aware of that fact; in Clark's apt phrasing, "time is doubly important" (p. 266). This leads to the proposal that the participants in any joint action, including language use, are subject to a constraint Clark (1996) calls "the temporal imperative" (p. 267): "In a joint action, the participants must provide a public account for the passage of time in their individual parts of that action" (p. 267).

Speaking (with ideal delivery) is the best public account participants can give of what they are doing with jointly shared time. For Clark, speaking covers any form of addressee-oriented signaling, not just speech. Thus, making a facial gesture or pointing to an alphabet board would constitute an act of speaking, and so would a public account of how the time is being used. However, once there is a pause there is no longer a public justification of actions. Similarly, when an individual constructs an utterance on an augmentative communication device in silence, the act is an individual

one and in and of itself does not provide a public account of the passage of time—although when the utterance is played or displayed it does become a public account during the period it is issued.

People's behaviors in communicative interaction provide good evidence of their awareness of various aspects of the temporal structure and temporal constraints of joint actions. For instance, for English speakers, under the constraint of the temporal imperative, silent pauses are limited to about one second, after which one or the other participants will tend to speak, produce a nervous cough, or produce a filler like "um" or "uh" (Clark, 1996, p. 268). Building on the work of Sacks, Schegloff, and Jefferson (1974) and other conversational analysts, Clark (1996, p. 88) notes, "people are able to project entry and exit times in conversation with surprising precision," a point he associates with the idea that "people take it as common ground that mental processes take time" and have accurate heuristics for estimating processing difficulty. For example, if participants appear to be uncertain about what they want to say, then their addressees are likely to infer that processing time will take longer, and may demonstrate their recognition by commenting on the communication delay. Participants also order their contributions in time and deliver their contributions with the right timing, using constraints like the temporal imperative and heuristics like those grounded in processing time to guide them. Clark (1996) observes that "order in language use has been studied for a long time, but timing has not" (p. 171).

Yet another relevant temporal aspect in Clark's model relates to his position that language use is a form of participant coordination problem that requires continuous coordination of both content and process. Each participant in communicative interaction assumes that, in context, the problem of identifying the meaning and force of an utterance made by one of them has a unique solution that can be identified because there is sufficient available information. To arrive at that solution, speakers and listeners have to determine what participatory actions they expect each other to take, and they will deploy resources that signal what actions are expected. These resources, or coordination devices, rely on a principle that the ideal solution is the one that participants recognize as "most salient, prominent or conspicuous with respect to their current common ground" (p. 91). Clark (1996) reasons that, because communicative interchanges are a time-constrained sequence of coordination problems, the time needed to solve one of the component problems (the launching and interpretation of one utterance, for instance) must be immediate. He therefore proposes the immediacy premise: "In a coordination problem set by one of its participants in a time-constrained sequence of problems, the participants can assume that they can solve it immediately—with effectively no delay" (p. 69).

Participants in a conversation tend to bring with them convictions as to what knowledge, beliefs, and suppositions they share with their interlocutors. This is their common ground. As joint communicative interaction unfolds in time, the local immediate resolution of one communicative action will enter the common ground of the participants, and this will typically function as the basis against which a new coordination problem is resolved,[1] and so on until their larger joint project is accomplished. The coordination of *process* and *content* will be expected to be essentially synchronous, as will the timing of the addressee's processing in relation to a speaker's completion of an element of the utterance. Clark writes (1996):

> In conversation, then, addressees are expected to have completed their processing of a phrase roughly by the time speakers finish that phrase. The immediacy premise should hold for phrases of all sizes. At the level of single words, addressees should have completed hearing, identifying and grasping a word by the time speakers go on to the next word. At the level of intonation units, they should have understood what was meant in the current unit before speakers initiate the next one. If processing weren't roughly immediate, delays in one phrase would accumulate with delays in the next, making synchrony even more difficult down the line. (p. 88)

If we understand the immediacy premise correctly, then it would appear that there are a number of ways in which this premise could be compromised, meaning that participants would not assume immediacy and would encounter delays and other problems in the interaction. Some of these are listed below:

- If participant A believes that s/he does not know what participatory actions to expect of participant B, s/he will assume delays in interaction.
- If A is familiar with the body-based signals (coordination devices) of B, misunderstandings and delays in interaction will be assumed.
- If the participants diverge on their interpretations of what constitutes the current common ground, and especially what is salient within the common ground, then solvability will not be immediate and the immediacy premise will be compromised.
- If the online coordination of process is not essentially temporally synchronous with the coordination of content, then delays will be expected.

[1]This is essentially Clark's notion of "grounding." He writes (1996): "To ground a thing, in my terminology, is to establish it as part of common ground well enough for current purposes" (p. 221).

- If the addressee fails to comprehend a communicative element (or phase) produced by the speaker, then the successful processing of any larger constituent within which that element is contained may be compromised, resulting in delays and misunderstandings.

The interactional organization of mouth-speech communication is built to avoid and minimize interaction problems; participants adhere to the temporal imperative and exploit the immediacy principle to their communicative advantage. The sociocultural and psychological properties of conventional mouth-speech interaction afford relatively effortless and rapid production of speech and gesture. Turn taking and the exchange of speaking roles are commonly achieved nonproblematically with little or no temporal cost. If the current speaker realizes that his or her interlocutor needs additional information to aid comprehension, he or she can change the utterance-in-progress to meet the interlocutor's needs without noticeable communication delay. If a misunderstanding occurs, interactants share a wide variety of resources to mark and repair the communication problem immediately, again minimizing potential delays.

In augmented interactions, the communicators are faced with many of the potential communication problems noted above. In using media similar to written communication to perform face-to-face interactions, augmented speakers and their interlocutors are frequently unable to adhere to the normative requirements contained in the temporal imperative, but are under considerable interactive and social pressure to do so. As this chapter demonstrates, potentially disabling conditions arise from a complex of body, technology, and information-processing constraints in communicative interactions . These constraints help elucidate many of the interactional problems and unique adaptions found in augmented interactions. The crux of these problems are the issues of time and timing.

FIRST-PERSON ACCOUNTS

The preceding discussion begins to build a theoretical framework for examining time, timing, and the temporal requirements and constraints in communication and disability. These observations become all the more compelling when compared with the commentaries of augmented speakers about the impact of time and timing on their interactions and social relationships. The next two subsections of this chapter look at the comments of Creech (1992, 1996a, 1996b), regarding augmented interactions using a computer-based communication device; and Robillard (1994), concerning the use of a communication board for augmented interaction.

Creech

While Clark (1996) takes face-to-face direct oral speech conversations as the basis for his observations on language use, Richard Creech (1992, 1996a, 1996b) focuses on augmented communication. Creech himself is an augmented communicator, and though he has a master's degree in speech pathology, he considers himself not so much a speech pathologist as an augmentative communication specialist (Creech, 1992). Here we review some of the pragmatic principles and practical suggestions Creech has put forward with the aim of helping augmented communicators increase the quality of their communications in various settings. Because he believes that communication activity is a function of the interaction of motivation, effort, and time, it should not be surprising that time and timing issues are prominent in his work.[2]

To understand some of Creech's comments, it is important to know that he is addressing his comments to people who use augmented communication devices that are similar in design to the one he himself uses. That is to say, he presumes use of a computerized communication device, accessible by a keyboard or switch and equipped with synthesized speech output. Creech himself uses a head-mounted pointer to make selections. There are established routines for accessing stored vocabulary, and the user can also spell out words to be spoken. There is a screen display (often only intended for the user). Text to be spoken later can be stored ahead of time. In composing utterances online, there is an option to have words spoken as they are selected, or to wait until the entire utterance is finished before launching it into the discourse.

Creech's aim is to improve the communication of augmented communicators in interaction with both oral speakers and other augmentative speakers in dyadic and group settings. We can find in this work echoes of Clark's notion that communicative interaction is a joint activity with joint responsibilities and requiring joint management. With respect to what we might consider as personal time management constraints, Creech writes (1996b):

> Timing is a pragmatic that a polite augmented communicator is aware of and adapts his or her conversations around. By timing, I do not mean rate of speech. What I mean is being conscious of how much time the other person has to talk and adjusting the conversation accordingly.

Creech's sense of *timing* is not only about rate, but also concerns duration. Underlying such a pragmatic is the understanding that, from the

[2]He offers an equation concerning communication that reads as follows: "communication activity is equal to motivation, minus effort, divided by time" (1992).

perspective of the broader English-speaking speech community, utterance formulation on a communication device often takes considerable time. Creech (1996b) observes that "people can easily get to thinking of an augmented communicator as someone with whom they cannot have a conversation without it taking a block of their time," an attitude that can easily have the deleterious social effect of casting augmented communicators as communicatively incompetent. His practical advice for how "augmented communicators can be considerate of the other person's time" is as follows:

1. "If the other person is busy, use short and direct sentences, using words that are in communication device's vocabulary. . . . spelling words simply uses too much of the group's time"
2. "If a person is busy working on something, use 'Speech Off' and speak only after composing a complete thought"
3. "If the person stops what he/she is doing to listen, use immediate speech and speak each word as it is entered so that the person might be able to anticipate the sentence before you complete it"

Note that each of these three suggestions is sensitive to the context of the addressee and respects a general principle that the participatory acts of a communicator tend to be custom-designed to suit the context. In particular, we have a recognition that time is shared time and the actions taken to make the best use of each person's time will vary according to individual needs and circumstances. Creech appears overtly aware of his interlocutor's needs, making suggestions for altering the output method of the device to best meet his addressee's particular communication requirements given differing communication situations. For example, if we examine the third suggestion, we see that Creech is encouraging interlocutor co-construction of a message as a timesaving device. If the addressee is already attending, then giving him or her nothing to attend to runs one into the problem of Clark's temporal imperative—there is no public accounting of what is being done with the jointly shared time. By using immediate speech, the augmented communicator both works within the constraints of the temporal imperative and allows the interlocutor the chance to contribute to the temporal structure of the interaction through co-construction.[3]

From Creech's point of view, interlocutors also have responsibilities to tailor their behaviors to optimize the quality of the interaction. As has already been noted, it can be a laborious process for an augmented com-

[3]But, see the following section for an account of the sort of problems co-construction can lead to.

municator to construct an utterance, and Creech (1996a) writes: "If I can take the time and the energy to generate the message the other person has the time to listen and respond to that message." So, each participant has to be mutually considerate of time and situational constraints, and each has to be given the space to say what he or she needs to say. Thus, another of Creech's suggestions is to "take the time you need to say what you have to say" (1996a). He follows this up with the personal observation:

> there have been times when I did not take the time to communicate everything that I wanted to say because I didn't think that what I wanted to say was important and the other person was obviously busy, but now I realize that what I have to say is just as important as what anyone else has to say.

It happens all too often that augmented communicators overvalue the time of others in relation to the value of their own communicative desires and needs. The result may be that they do not communicate at all or keep their contributions as minimal and "practical" as possible. This again can lead to false perceptions and an underestimation of their actual communicative competence (cf. Hoag, Bedrosian, Johnson, & Molineux, 1994). Creech's admonitions also exemplify a predominant dilemma for augmentative speakers. By taking enough time to communicate, do augmented speakers compromise their listeners' attention abilities or conflict with their time budgets?

In group (i.e., polyadic) settings, the problem of taking the time to say what one has to say can be compounded by the fact that the topic can change or advance before one of the participants has the chance to get his or her contributions to the topic out into the discourse. Augmented communicators may have a rapid method for signaling that they wish to comment on a particular issue, but during the time they are formulating their contribution other participants may have entered further information into the common ground and participants' attentions and understandings may have shifted, causing an extra processing load when a comment addressing an earlier point is launched. On this matter Creech (1996b) observes:

> What I do have is a quick communication marker signal-message stored under a two-icon sequence. This signal-message contains a 3-tone signal, followed by a 2-second pause, and the message, "I will comment on this; please continue talking while I prepare what I want to say." . . . *my feeling is that however long it takes for the augmented communicator to compose the message, it becomes the group's responsibility to remember the topic of the comment and to return to it when the augmented communicator makes his/her comment.* [italics added]

Thus, instead of conceiving of a contribution as mistimed or irrelevant to current context, Creech argues that it is up to all the interlocutors to keep

a log that recognizes both the appropriate timing and relevance of the contribution.

English-speaking augmented communicators are all too well aware of the brevity of the pauses with respect to which one times one's entry into conversation, and against which one has to guard so that the floor is not lost. Moreover, they are very conscious that there are conventional communicative means (coordination devices) for gaining and keeping the floor, but such conventions are often unavailable to them. Creech (1996b) notes that "often the pause between when one person stops speaking and another starts is so short that politely taking the conversation becomes next to impossible." With some humor he states (1996b):

> Everyone needs a way to signal that he or she has something to say. Most people can just raise a hand or quickly speak up during a pause in the conversation. If I were to try to signal the desire to speak by raising my hand, I would be likely to have a spasm and knock the person sitting beside me out of the chair. I find saying "excuse me" to be the most effective label that a speaker can add at the end of his or her sentence to get the floor again, and it's a lot safer than raising my hand. I have "Excuse me" encoded in my Liberator[4] so that it does not appear in the Liberator's display.

Thus Creech faces many of the same coordination problems facing all English-speaking communicators. In the case just discussed, he faces the problem of gaining (and/or keeping) the floor, and the temporal imperative is just one of several factors that place a constraint on the set of possible strategies he can use to solve the problem in a socially acceptable and explicit fashion. To the extent that socially conventional solutions to the problem are not available to individuals, due to physical differences, new conventions (new coordination devices) need to be formulated and recognized. In closing one of his presentations, Creech (1996b) appeals to his fellow augmented communicators by stating: "We must not be satisfied merely with being able to communicate; we must strive to communicate with excellence." As we have seen, he clearly believes that an understanding of time and timing is critical to that goal, as is the recognition that the onus is not only on augmented speakers to communicate with excellence but also on their interlocutors—be they mouth-speech communicators or other augmented communicators.

Robillard

Albert Robillard is a sociologist who has cast an analytic and self-reflective eye on the nature and quality of his communicative interactions with hospital care providers during his own three and a half months of hospitali-

[4]Creech's augmentative communication device.

zation (primarily in an Intensive Care Unit [ICU]) (Robillard, 1994). He has a neuromuscular disease, which manifested itself 6 years prior to the period of hospitalization he writes about. As a consequence of this neuromuscular disease, he cannot talk, but can carry on face-to-face interactions either through deliberate lip movements, which his interlocutor must be able to read, or through using an alphabet board. Concerning these two means of communication he writes (1994, pp. 383–395):

> This [i.e., lip movements for lip reading] is a slow process and does not match the real time order of natural conversation. Moreover, the number of people who can read my lip movements is highly limited. My lip movements are restricted, due to weak lip muscles, and it takes intensive training and exposure to be able to read my lips. . . . Otherwise, I have to communicate by using an alphabet board, an even slower process than lip reading. (p. 385)

With hospital staff his primary online communicative resource was his alphabet board if he was trying to address them directly. Alternatively, he could sometimes address staff through an intermediary who was acting as interpreter and was either reading his lips or his alphabet board. By and large, Robillard's attempts at online communicative interactions with the people responsible for his care were unsuccessful and unrewarding, and left him essentially disenfranchised from personal control over his own health care and treatment. He notes (1994) that:

> Not being able to conversationally influence most aspects of my experience in the hospital generated frustrations, resentments, and attributions about my intelligence, my motivations, and, equally from my perspective, about the intelligence, motivations, sensitivity, and the irrationality of the entire health care delivery system. (p. 386)

Failed joint actions generally stem from shared problems, but a common human reaction is to find fault with one or another of the participants. Robillard the analyst does not fall into this trap. In seeking to analyze the nature of the predicament he found himself in, he looked closely at the physical, social, and cultural aspects of his communicative interactions and identified relevant parameters of the shared conversational environment that influenced the quality of interactions.

Robillard emphasizes that the communication problems he encountered trace directly back to his bodily (muscular) constraints in the face of an institutionalized view of the "normal" rhythm of communicative interaction. It is due both to his neuromuscular disease and to conventional communication practice that he "cannot talk or communicate in anything approaching the social consensus of 'real time'" (Robillard 1994, p. 384).

He is well aware of the time and timing that underlie standard American English conversational practice, but his body cannot "swim" in that time stream. He states (1994):

> The institutionalized, naturalized, socially consensual order of conversation has a time order, a rhythm, that assumes an intersubjective coordination of physical human bodies. Having a body which could not inhabit this time order was a breach of the normalized conversational environment. (pp. 393–394)

This is not to be interpreted simplistically as being physically unable to produce speech in real time, since, as we have already seen, time and timing in interactive communication involve so much more than just speech. Robillard makes it clear that the same bodily constraints that affect his speech production also affect his body gestures, his gaze control, and other potential body-based communicative resources, which might otherwise have been marshaled into use for directing and layering his own communicative productions. Moreover, deployment of bodily resources, such as visual attention, to operate a communication device can keep the augmented speaker from being able to monitor the cues of his mouth-speech interlocutor. For instance, employing an alphabet board requires the user to maintain visual contact with the device, reducing the opportunity for visual monitoring of the interlocutor. This can lead the board user to miss vital cues as to where interactions are breaking down, can inhibit synchronous communication, and can lead to communication delay. Robillard (1994) writes about the problems that ensue: "Tied down to looking at the spelling as it was written, I was usually unaware of the behavioral signs of the need to respecify and was at a loss in formulating a proper interpretational context" (p. 392). In addition, Robillard experienced difficulty with translators who couldn't merely read out his spellings on an alphabet board. He states (1994):

> Because I could not talk while my translator was reading what I said, I frequently experienced gross editing of what I said. Sometimes the translator would refuse to say my thoughts. More frequently the translator would not be assertive and translate my thoughts at the proper spot in the conversation, choosing to wait, delaying my participation and leading to further out of context remarks. (p. 392)

So, while use of an alphabet board may require co-presence and co-participation of participants and online generation of communicative acts, in a very important sense it is not the normative form of face-to-face interaction: The interaction setting created by the device imposes severe re-

strictions on the augmented speaker's ability to play a successful role in the interaction.

Robillard distinguishes between the "socially consensual real-time" order embraced by the normative societal perspective of face-to-face interaction and basic to Clark's (1996) description of language use, and the temporal order manifest during his slow and labored alphabet board mediated interactions, which require the constant attention and cooperation of the interlocutor. Further, this alternative time order would often conflict with the time budgets of the medical staff, a situation that Robillard discussed as two different types of interaction problems.

First, physicians "operating under tremendous subjective time pressures" (Robillard, 1994, p. 386) would frequently generate interactions about his care or treatment. However, they would leave him with no other way to respond but by giving a nod "yes" or head shake "no," since any qualified answer he would try to give would fail, either because the physicians would not see themselves being addressed by Robillard's spelled out reply, or because they would leave before the conversation had come to a satisfactory conclusion. In their attempt to negotiate the situation:

> The physicians would suggest that I formulate what I had to say before they came. This suggestion left out the possibility to respond to any emergent conversation while they were in the room. It also assumed that I would remember what I wanted to say in conversational contexts long after the conversation had passed. (Robillard, 1994, p. 386)

Second, the "Not now" problem occurred when care providers would regularly determine the time when Robillard could and could not generate an utterance for them. Starting a production did not automatically give him control of the floor.

> "Not now" can take three avenues. The first is simply saying "Not now" when I am trying to speak. The second is when the party I am speaking to cuts me off by attending to another task, usually walking away in mid-sentence. The third possibility is when another interrupts my conversation, taking over the interactional focus. (Robillard, 1994, p. 391)

The avenues that Robillard lists above can happen in any face-to-face conversation. The "Not now" act is not a problem in and of itself, but presents a problem in relation to the frequency with which it occurred and the time and labor costs it incurred for Robillard. Because of the time it took for him to generate his utterances, interlocutors would often rank their time needs over his own. However, this loss of control of when he could speak effectively devalued both his time and labor and also brought into question the importance of his contributions. Moreover, interruptions and

walking away in mid-sentence tended to generate a context in which the conversational thread was lost, meaning that a considerable physical effort would be needed to backtrack and reconstitute the background for the generation of the original utterance. This, in essence, is the third problem, the "out of context" problem. Robillard (1994) writes:

> It takes so much effort to spell out what I am saying I could not easily recycle the topic by saying "You know what we were speaking about a little while ago, the X topic." I could only, because of time and energy, speak directly to a former topic. This speaking out of context would generate many complaints and confusion. It would often break off further communication. (p. 391)

Robillard's production of utterances that were deemed to be out of context became the locus of attributions concerning his intelligence and common sense ("Are you crazy?"; "What the hell are you talking about?").

The situation of resuming a discontinued interaction provides a temporal conflict with no good solutions: If one spends the time and effort to provide the background needed to revive a failed communication, one faces the very real likelihood of running up against the "Not now" problem yet again (with a potential continuous loop effect). But if one generates a direct utterance on the premise that one's interlocutors will be able to remember the original context of the interaction after some time has past (and their attention has been directed to some other task), then one risks the possibility that the interlocutors cannot reconstruct the earlier context and instead judge the utterance to be out of context and inappropriate (and so reflective of a certain personality or turn of mind).

Although Robillard ran into these same general problems with all the hospital health care providers, this does not mean that the quality of the interactions was the same with all conversational partners. In fact, from an ethnographic point of view, one of Robillard's most important observations concerns the sociocultural factors that seem to be involved in distinguishing those individuals with whom he was able to carry out successful interactions from those with whom he had great difficulties interacting. Robillard observed significant differences between two groups of nurses; one group he terms "flying nurses" and the other he terms "authentic local nurses." Flying nurses were not native residents of the area of the hospital (Hawaii), but tended to come and work on 3- to 6-month contracts and then move on to work another contract at hospitals elsewhere. By contrast, local nurses were, like Robillard himself, long-term residents of the area, and most had been born, raised, and educated in the area. Critically, "none of the flying nurses would use the alphabet board" (Robillard, 1994, pp. 387–388). Those who tried soon became frustrated and

stopped. The four people who consistently used Robillard's communication board all fell into the local nurse grouping. Moreover, they were all women; "no male nurses even attempted to use my communication board" (Robillard, 1994, p. 389).

In trying to explain these differences, Robillard makes a convincing argument for the role that closely shared cultural background can play in facilitating effective communication. Robillard and the local nurses belonged to many of the same cultural communities and shared particular inside information, whereas he had far less in common with the flying nurses. This had a profound effect on the tenor of communicative interactions. Local nurses could conversationally situate their patients as individuals sharing the same background assumptions and adhering to the same local social conventions. He elaborates as follows:

> Authentic local nurses could by glances, gaze, facial expression, vocabulary, syntax, cadence, dialect, body language, and topical reference conversationally locate themselves and the patients as members of and constrained by the same local culture and social structure. . . . There was a reciprocity of highly detailed knowledge which located me and them. I felt that they knew me as a unique situated individual. I felt I knew them as situated individuals. (Robillard, 1994, p. 388)

Flying nurses, on the other hand, shared almost none of this detailed knowledge and so could only locate Robillard as "a generic person." These differences seem to be critical in the initial phases of initiating a new acquaintance into using the communication board. Robillard reports that the very first conversations between him and individual nurses (both local and flying) invariably started in the same general way (questions about where he came from and what he did). However, flying nurses could not pick up on his answers in the same way as local nurses. Where local nurses could quickly begin to chase common threads and affirm a strong social and cultural bond, the flying nurses were left searching for further things to say. The flying nurses had no stake in continuing a conversation; their patients were individuals with whom they would have no future contact and with whom they shared no significant acquaintances. As a result, they had no motivation to continue using the alphabet board. In fact, some flying nurses never even tried, and Robillard (1994) notes that the most memorable flying nurse addressed him on their first meeting by stating "I am the nurse from hell and do not try any of that communication shit with me" (p. 388).

The differences between the two groups of nurses not only meant that each would have a different evaluation of the fruits to be gained from the time and effort spent in interaction with Robillard, it also meant that the pragmatic resources they could draw on were different. The wealth of shared knowledge (and shared interactional strategies) that Robillard and the local nurses possessed meant that they were better able to anticipate

each other's moves than Robillard and the flying nurses were. The problem for Robillard was that the vast majority (90%) of nurses with whom he had to interact on a daily basis in the ICU were flying nurses. Since communication with these nurses was impaired by the fact that they wouldn't use his communication board, real problems ensued. Robillard (1994) describes the situation as follows:

> My insistence in talking and being heard, expecting what I said to influence behavior, led to a spiral of mutual antagonism between myself and the flying nurses. Communication with flying nurses was a lost cause. I quickly came to think of them as nearly anonymous parts, universally interchangeable, mirroring what I thought they thought of patients. (p. 389)

As noted above, not all local nurses entered into consistent communication board use with Robillard. Thus, this shared background was not sufficient to guarantee positive interactional outcomes. In particular, Robillard (1994) noted a difference between males and females; it is his experience, not just in the hospital setting, that "males, in general, appear not to have the patience or the multiple communication rhythms to be able to use alternative means of communication" (pp. 389–390). Such observations deserve a wider investigation. Still, it is significant that certain individuals can step out of the normative grip of the time order of socially consensual real-time conversation and enter into the different time order of alphabet board use with Robillard. He ends his paper with the apt observation: "Yet, as I learned from the local nurses, there are a few people who demonstrated the normal time order is but one among many time orders and structures for communication" (p. 394).

Still, it should not be forgotten that Robillard was unable to negotiate an alternative time order and structure for communication with the vast majority of his care providers. The result was that "not having a real time voice was the equivalent to not having any defense to what was done to" his body (Robillard, 1994, p. 386). The inability to intersubjectively coordinate his communication patterns with the rhythms of those responsible for his care challenged the very fabric of his sense of self.

CASE STUDY

To expand on the first-person commentaries sketched above, this section presents an observational case study of the time and timing issues that arise in one augmented speaker's selective deployment of both a communication board and a computerized device. These observations are further contextualized by her own commentary on specific instances of communication and on her augmented communications more generally.

The primary participant in the research presented below is Jane Denton.[5] On completing her undergraduate degree in chemistry in 1967, she contracted encephalitis. As a result of this disease, Jane is incapable of producing sustained vocal speech and must use a wheelchair to locomote. Approximately 15 years after the onset of her illness, Jane returned to school to complete a master's degree in chemistry. Currently, she resides at a nursing home for persons with disabilities in Erie County, New York. Jane has known and worked with the first author since 1989.

This study focuses on Jane's use of two different augmentative devices (a communication board and a Dynavox) to communicate "verbally" with her interactants. As described in detail in another study (Higginbotham & Wilkins, 1997), Jane also uses a wide variety of face, head, and limb gestures during interaction. Depending on the particular communication setting, she may either interact entirely with her gestures, or rely on her communication devices for linguistic support.

Her communication board consists of the alphabet, several punctuation marks, numbers 0 through 10, the days of the week, 281 words arranged (and color coded) in alphabetical order, and several regulatory phrases (e.g., "end of word," "by the way") (Appendix A). Jane's Dynavox is a computerized communication device equipped with a dynamic, touch-sensitive display screen and synthesized speech output. Although Jane has a number of different communication displays at her disposal she was only observed using her word prediction display. The word prediction display consists of an output window, the letters of the alphabet, the numbers 0–10, several device control buttons ("backspace," "clear display," "speak") and 5 "prediction" buttons (Appendix A). To operate the device, Jane keys in the letters of the intended word. After each letter is selected, the Dynavox searches its database for the five most likely words to be used and displays those words on the prediction buttons. If the desired word is shown, Jane can select it, otherwise she must keep typing out the word. After constructing her utterance, Jane can speak the message through the speech synthesizer by pressing the speak button. She uses a standard desktop computer to correspond with friends and colleagues via E-mail. She also writes with a pen and pencil, although, because of her physical condition, handwritten communications are usually limited to her signature.

The primary data used for this study includes one audio and two videotape recordings taken during February and March 1997. These materials were supplemented by additional recordings of a shopping trip, a class lecture and two debriefings about prior observations made between January 1990 and June 1997. Table 3.1 details the data sources.

[5]In order to provide a direct way of discussing Jane Denton's performance in the transcriptions, as well as her commentaries on communication, we use her first name.

TABLE 3.1
Data Sources Used in Study

Data Source	*Setting*	*Devices Used*
1. Audiotape. 1 hour 48 minutes, recorded February 1997.	Conversed with Jeff (1st author) during equipment preparation, and Jake (friend) in the library.	Wordboard and Dynavox with Jeff; Dynavox with Jake
2. Videotape. 2 hours, recorded March 1997.	Conversation with Jeff during equipment setup and participation at a residence council meeting.	Wordboard and Dynavox with Jeff; Dynavox during meeting
3. Videotape. 2 hours, recorded March 1997.	Conversation with Jeff in living quarters.	Wordboard and Dynavox
4. Videotapes (2), recorded in June 1997.	Performance testing of devices, conversations, and interview.	Wordboard and Dynavox
5. Audiotape. 1 hour, recorded August 1994.	Shopping trip with two research assistants of the first author.	Dynavox
6. Videotape, 1 hour, recorded January 1990.	Lecture to graduate class in augmentative communication (UB).* One camera focused on Jane, the other on her communication board.	Communication board

*State University of New York at Buffalo.

Time and Communication Rate

As with most augmented communicators, rates of Jane's communications are approximately an order of magnitude or more slower than that of mouth-speech communicators.[6] Jane is fastest at using her communication board, achieving communication rates averaging 19 words per minute (table 3.2) during solitary or dyadic communication situations. In contrast, her productions on her Dynavox communication aid are over two-thirds slower, averaging 6.5 words per minute.

Interaction with Jane via her communication board is usually a collaborative affair between Jane and her interlocutor, involving a rapid interplay between Jane's board indications and her interlocutor's response to her pointing. When Jane employs a communication board, her communication rate is determined by a functional interaction between her word choices (spelled out or selected), the latency and duration of her interactant's response to her points, and her interlocutor's deployment of various interaction strategies such as guessing. The differences in communication board communication rates in Table 3.2 may evidence a collaborative attempt by Jane and her interlocutor to adhere to the temporal imperative

[6]The average rate of mouth-speech for English speakers is around 150 words per minute.

TABLE 3.2
Average Communication Rates for Jane D.[1]

Device/Context	*Communication Rate*
Communication Board	
1. June 1997—question answering/no facilitator (80 words over 3 utterances)	16 wpm[2]
2. March 1997—conversations with Jeff (2 sessions: 42 words over 4 utterances)	22 wpm
3. February 1990—lecture to class/with facilitator (46 words over 3 utterances)	17 wpm
4. February 1990—lecture to class/no facilitator (30 words over 3 sentences)	20 wpm
Average communication board rate	19 wpm
Dynavox	
5. June 1997—answers question w/ word prediction (59 words over 3 utterances)	5 wpm
6. June 1997—answers question w/ no prediction (55 words over 2 utterances)	6 wpm
7. March 1997—conversation with Jeff w/ prediction (50 words over 5 utterances)	7.5 wpm
8. March 1997—group meeting w/ prediction (12 words over 2 utterances)	7 wpm
Average dynavox rate	6.5 wpm

[1]Average communication rate was obtained by taking the median utterance level communication rate for a given session. Utterances of 3 words or less were omitted from this analysis.

[2]Words per minute.

through the selective use of these strategies. For example, utterance length is shorter and communication rate is faster in the fully interactive sessions, compared to Jane's performance on the non-co-constructed question-answering task.

Below is a typical example of collaborative board use:

[16:34][7]
1. Jane: W-O-U-L-D[8]
2. Jeff: would
3. Jane: YOU

[7][minutes:seconds].

[8]Augmented utterances are displayed in capital letters. Spelled out words are indicated by dashes between letters. Spoken works are in lowercase. Terminal punctuation indicates rising (?) and falling (.) speech intonation. Neutral intonation is not marked. Coversational overlap is marked by a caret (^). Unintelligible speech is marked by (. . .).

4. Jeff: I
5. Jane: LIKE
6. Jeff: like
7. Jane: T-O H-E-A-R
8. Jeff: hear
9. Jane: w-h-a-t
10. Jeff: what
11. Jane: I A-M
12. Jeff: You're going to say?
13. Jane: YES
14. Jeff: Yes. It is three to two, is that an issue?

[16:54] (total elapsed time 20 seconds for an utterance-level communication rate of 33 wpm.)

In this example, Jeff can be observed (#12) to increase the communication rate by interactively recasting Jane's utterance and by guessing the last 3 words. These tactics, although unconsciously deployed, may have saved time by alleviating Jeff's need to reiterate the utterance and reducing Jane's utterance production by 3 words, thus reducing the total utterance production time by about 7 seconds, or 25%. To interact successfully, Jane's interlocutor must attend to the ongoing message production and co-construct an utterance-in-progress after each letter or word is indicated. The interlocutor's spoken account provides a public record of the utterance, offering an overt means for establishing and developing common ground and verifying for Jane that her productions have been successfully received.

The openly collaborative effort observed in communication board utterance formulations is largely absent when Jane uses her Dynavox. Instead, she composes most of her message in silence, without her interactant's co-construction efforts—"uttering" them on their completion. For example:

1. Jake: Ohh yeah the rose I gave ya. Still alive?
2. Jane: [shakes head]
3. Jake: Dead already. I never did get to see it in full bloom anyway. Of course (. . .) that's all that counts. Did it have a peaceful death?
4. (55)[9] (Jane formulates sentence, Jake intermittently looks at Jane, looks around library, stares into space)
5. Jane: IT NEVER REALLY BLOOMED.
6. (4)
7. Jake: Oh it didn't? Somebody's head will roll for that one.

In the above example, it took Jane 55 seconds to respond to her friend's query, with the vast majority of that time spent in silence while Jane con-

[9]Silent interval, in seconds.

structed her response. Although it allows her to construct utterances independently from her interlocutor, the Dynavox imposes other temporal costs on Jane's message productions, which interfere with her and her interlocutor's ability to communicate. An analysis of the videotape taken of Jane and her device when obtaining rate data (Table 3.2, #5), showed that there was a noticeable delay from the time Jane selected the letters or words to the time the computer registered the choice by highlighting the selection. This delay ranged from about a quarter of a second to 4 seconds in length. Jane was also observed to pause for several seconds each time she visually scanned her prediction list. Such device-related delays can impose significant limits on utterance production rates—in this case contributing to the more than 65% percent decrease in speed compared with her communication board use.

Jane's strategy of constructing an entire utterance in silence on the Dynavox before speaking it, makes adherence to the canonical temporal imperative impossible (i.e., speaking turn must be initiated within a few seconds after the previous turn has ended). Jane and her interlocutors are required to arrive at an alternative temporal order in which to sustain interactive communication. During her Dynavox productions, it is common practice for Jane's interlocutors to disattend to her while she formulates her message, then to reattend to her when they hear the utterance being produced by the communication device. This particular attentional organization allows Jane to construct and issue utterances with her Dynavox while minimizing the communication effort of her partner. It is not a cost-free solution to the problem of the temporal imperative, as is seen in following sections.

Timing

According to Clark (1996), successful temporal coordination of actions is necessary to successfully transact face-to-face interactions. When using an augmentative device, Jane's coordination problem is one of utilizing particular pieces of communication technology, given her physical abilities, within the joint time constraints she shares with her interlocutors.

Having engaged her interactant in conversation, Jane deftly moves her stylus from item to item with only a fraction of a second separating some of the points, as can be seen below:

1. Jane: [22:90 - 23:00][10] ALL
2. Sue: [24:60 - 25:23] about
3. Jane: [25:47 - 25:57] NO
4. Jane: [26:50 - 26:57] ALL

[10][seconds:milliseconds].

5.	Sue:	[26:50 - 27:30]	all?
6.	Jane:	[28:27 - 28:40]	MOST
7.	Sue:	[29:47 - 29:90]	almost^.
8.	Jane:	[29:73 - 31:53]	I-M-M^
9.	Sue:	[32:23 - 32:93]	immediately?
10.	Jane:	[33:20 - 33:27]	YES
11.	Jane:	[34:27 - 37:30]	T-H-I-N-G^S
12.	Sue:	[37:03 - 37:33]	things
13.	Jane:	[38:97 - 41:10]	B-E-G^A
14.	Sue:	[40:43 - 41:00]	began
15.	Jane:	[42:30 - 42:33]	TO
16.	Sue:	[43:30 - 43:83]	to
17.	Jane:	[43:57 - 44:40]	H^A
18.	Sue:	[43:90 - 44:27]	happen
19.	Jane:	[44:70 - 44:80]	YES

The interaction depicted above exemplifies how Jane and her interlocutor are able to achieve a close temporal coordination with one another. Note for example how Jane's turns occur within a second or less of Sue's, and in fact occasionally overlap Sue's utterances, as at #7 when Jane begins to spell out "immediately." Note that Jane quickly adjusts to Sue's guesses either by providing feedback ("YES," "NO") as to the success of Sue's reading and guessing, or by moving on to the next word.

Thus, with her communication board, Jane could participate in the joint interaction activity well within the temporal limits of face-to-face turn taking and maintain her interlocutor's attention throughout the process. Here the coordination of the process of utterance production is temporally synchronous with the production of content. In order to accomplish this, Jane's interlocutor must pay close visual attention to each finger point as it occurs. When misreadings do occur, the point-response routine observed here also allows the interactants to locate and resolve their communication problems, as they are recognized, within the just produced discourse (Buzolich & Wiemann, 1988; Higginbotham, 1989; Higginbotham, Mathy-Laikko, & Yoder, 1988). This looks to be an important manner in which the interactants can resolve local difficulties immediately and ensure a progressive establishment of common ground: letter-by-letter or word-by-word.

Jane's abilities to engage in temporally synchronous actions with her interlocutor are dampened by the performance characteristics of her Dynavox. Because of the time it takes to produce a message with her electronic device, it is difficult for Jane to temporally coordinate her utterance with the expectations of her interactant. For example, when beginning to converse with her friend Jake, Jane takes more than a minute to construct her utterance. Commenting on the long period of silence, Jake urges Jane to speak by saying, "Your turn, Jane." Later in the interaction (see example below), she responds to a statement made by Jake about his family, and

a problem arises due to the 98-second interval (#8, #10) between Jake's last topic-relevant utterance ("But I never heard of them") and Jane's response ("They may be related from way back"). During the intervening time Jake spoke several utterances (#7). What followed was a repair extending across several turns in which Jane kept reiterating (i.e., replaying) her utterance until it was correctly understood by Jake:

1. Jake: Ever see those Rococco commercials on TV before?
2. Jane: (head shake)
3. (4)[11]
4. Jake: Is that yes or no?
5. (4)
6. Jane: NO.
7. Jake: Oh, those people aren't related (. . .) to my family. But I keep lookin at them tryin to see (. . .) They're two brothers. With a car dealership, and I looked at them and try to see if there was some resemblance. But I never heard of them. (. . .)
   There are a lot of people in the phone book, there are a lot of people in the phone book have that name.
8. (42)
9. There used to be a priest named Monsignor Rococco.
10. (56)
11. Jane: THEY MAY BE RELATED FROM WAY BACK.
12. (2)
13. Jake: What?
14. (2)
15. Jane: THEY MAY BE RELATED FROM WAY BACK.
16. (2)
17. Jake: See there, they made you . . .
18. (4)
19. Jane: THEY MAY BE RELATED FROM WAY BACK.
20. (5)
21. Jake: Maybe. Sound like you said, they may . . . I heard a word, "lady," in there didn't I?
22. (7)
23. Jane: THEY MAY BE RELATED FROM WAY BACK.
24. (4)
25. Jake: Oh, they may be related, could be, could be, but there are a lot of people with that name.

Fortunately, the Dynavox allowed Jane to repeat her utterance promptly until it was understood by Jake. If she had to reconstruct the utterance word-by-word or letter-by-letter, even more time might have been expended in the repair. Part of Jake's problem was his inability to understand the

[11]Silent interval, in seconds.

words in the utterance. This may have been due both to his difficulty recalling the topic and to the intelligibility of the communication device. This problem was exacerbated by the inability of the device to isolate and modify selected portions of the message text. For example, Jane could not repeat just the word "related" or have it spelled out unless she rekeyed the entire word again. And altering down the speed with which the utterance is produced is impossible for single utterances. In combination, these constraints can exact a significant temporal toll, by impeding interactional synchrony, interrupting the construction of common ground, and contributing to comprehension failure.

Not all of Jane's Dynavox-mediated utterances were so slow and delayed. When the utterance could be spoken in just a few selections, she could often produce it within a few seconds. Saying "NO" in the example above took Jane only four seconds to speak,[12] and it only took between 2 and 7 seconds to generate each repetition of her utterance later in the conversation. Jane would also strategically use short, nonspecific utterances to minimize the amount of interaction delay involved in the utterance construction process.

Another timing strategy Jane used was to pre-store anticipated utterances prior to the conversational encounter. At a meeting of her local Residence Council, Jane uses this strategy to enter into the group discussion at the proper moment:

1. [37:22-37:38][13]
2. Ken: Rita has drafted a letter, concerning vending prices to see if they could lower em. Because this is a nursing facility we don't have the money to pay the high prices that factories pay.
3. [37:39-37:42]
4. Jane: HAVE YOU CONSIDERED OTHER VENDORS AND THEIR PRICES?
5. [37:45-37:53]
6. Ken: That, I believe Jane, is up to uhm contract. That's a contract number. We have a contract with uh (. . .)[14]
7. [37:53-39:03]
8. Jane: (*starts message preparation*)
9. [38:23-39:04]
10. Rita: Does everybody understand Jane's original response?
11. .
12. . (Talk about the contract)
13. .

[12]Even though Jake could not make it out, her head shake was even more immediate (and was at least recognized as an interactive attempt to answer his question).

[13][minutes:seconds].

[14](. . .)—unintelligible utterance.

14. . . . but I think Jane is having a suggestion here for us.
15. 39:05 39:07
16. Jane: WHO DO WE GO SEE ABOUT CHANGING IT?
17. [39:37-39:42]
18. Ken: Dennis Gorski
19. Rita: Probably not, or do we . . .
20. Ken: its (. . .) with the county—they serve all the buildings, the Rath building, I believe they get the CFC, I think there're machines there, . . . I imagine you have to go through the county then, to change machines, to change vendors.
21. [40:12-40:12]
22. Ken: (whispered) Jane is busy.
23. [40:13-40:14]
24. Jane: THAT DOESN'T SEEM FAIR
25. [40:19-41:56]
26. Rita: Ahm, do you have um . . . Well contracts run out. You know contracts aren't for life. I mean they do eventually run out. uhm.
27. Ken: But that is the lowest bid. Whoever bids the lowest for the contract gets the contract.

.
.
.

28. Rita: Can we stick with the topic in terms of the canteen.
29. [41:59-42:02]
30. Ken: Do you guys want to wait until we hear back from this vendor?
31. [42:02-42:27]
32. Jane: (*starts message preparation*)
33. [42:02-42:27]
34. Rita: We've asked ^ them if they'd lower the prices. Then maybe we can think of a strategy or think of some steps to find out, if there is another vendor that could bring the stuff in cheaper? Wanna just wait until, I'm getting nods from everybody on that.
35. Ken: I don't think we can do anything until we get it, ahm, something back from that vendor, to find out if they're going to lower their prices ^
36. [42:27-42:28]
37. Jane: ^ ^HOW LONG.
38. [42:31-42:48]
39. Rita: I would say if we haven't heard from 'em by the next meeting. that we should probably take some reaction, but we just got that letter out last week. So, I guess by the next executive council meeting we should know, something. That, suffice or [. . .]
40. [42:53-42:53]
41. Jane: OK
42. [42:53-42:54]
43. Rita: All right, So we'll wait until we hear from the ah, present vendor.

. . .

At #3, Jane was able to begin speaking within a second of Ken's utterance termination. She indicated, in a follow-up interview, that she was able to produce the utterance in a timely manner because she had constructed the utterance prior to the meeting. When asked why, she stated: "BECAUSE I KNEW IT WOULD BE DISCUSSED. I HAD ALREADY DONE THAT. . . . BECAUSE I WOULD NOT BE ABLE TO PREPARE IT WHILE IT WAS BEING DISCUSSED." Inspection of the videotape also revealed that she physically prepared herself to produce the utterance at its appropriate projected point by placing her stylus (a pencil) on the selection 7 seconds prior to utterance production. She then waited until the turn-relevant point and lifted her pencil, which initiated the utterance. At #8, Jane begins to construct a response to Ken's talk at #6. She delivers her response over a minute later, after Rita has reiterated the vendor situation to the rest of the group. Similar to her preceding utterance, Jane pre-positions her pencil to lift off at an appropriate occasion. Her physical readiness to communicate, like posture and gaze behavior in typical communicators, may have served as a coordination device, cueing Rita at #9 to relinquish the floor and allocate her turn to Jane (". . . but I think Jane is having a suggestion here for us").

Jane's utterance productions are not always so overtly collaborative. At #32, she begins to construct a response to Ken's prior utterance. But during the intervening seconds, Ken responds to Rita, taking the conversation in a different direction. Instead of giving up, Jane interrupts Ken 25 seconds later (#37) by asking the question "HOW LONG?"

After viewing the videotape, Jane commented (with her communication board) on her motivations for interrupting Ken:

Jane:	I DID NOT HAVE TO LOSE THE OPPORTUNITY TO ASK MY QUESTION, AND I INTERRUPTED BECAUSE I DID NOT KNOW HOW MUCH MORE HE WAS GOING TO SAY AND I HAD TO HURRY TO GET IT IN.
Jeff:	And what is the risk of not getting it in quickly?
Jane:	HE WOULDN'T HAVE UNDERSTOOD THE TIME OF MY QUESTION IN THAT I WOULDN'T HAVE BEEN ABLE TO ASK IT AT ALL BECAUSE HE WOULD HAVE MOVED ON [IN HIS HEAD].[15] . . . THAT WAS RUDE, (BUT) I DON'T THINK HE REALLY MINDED.

If she had let it go further, her utterance wouldn't have made sense. Jane made the right timing choice. Her utterance was delayed, but its impact wasn't lost as it sometimes was in her earlier interactions with Jake. Through interruption, she was able to maintain her footing in the conversation and avoided Robillard's (1994) out-of-context problem.

[15]Interviewer's words, agreed to by Jane.

Minimizing Communication Costs Through Device Choice

Jane makes clear choices as to which device to use with particular individuals, based on their ability to understand her communications, her particular physical situation, and her time budget. In the following E-mail, Jane gives us a typical morning schedule of who she communicates with and what device she typically uses:

> 8; aide comes in . . . discuss when i will get up 10-10:30 aide comes in . . . discuss what i will wear, washes me, puts me in w/ch nrs 2 does treatments to skin areas affected . . . as i have requested
>
> btw,[16] KEY . . . INDICATES COMMUNICATION WITH COMMUNICATION BOARD
> //// " " "
> DYNAVOX
>
> 10:45 am in w/ch with dynavox . . . or //// depending on aide discuss what
> else i need e.g. Bible. papers, reading material, etc.
>
> 11 or 11:30 -12 in chapel doing daily devotions sometimes //// singing-limited

Jane uses different devices for different nursing aides. The communication board allows rapid communication with those staff members she can relate to and who see and read well enough to use it. Similarly to Robillard, Jane also finds that not all staff are willing to spend the time using it with her. If the staff person was uncooperative, Jane was unable to use any device to convey her thoughts. The Dynavox posed its own set of advantages and disadvantages. Although "bulky and slow" it does provide Jane the means to speak, regardless of her interlocutor's willingness to participate actively in the message construction process. As she noted in her E-mails to us, the Dynavox was well suited for communication with persons with visual, reading, or memory problems—people who have difficulty communicating with her via her communication board:

> . . . ptL[17] & thank U, Jesus for my dvx! without it I wudnt be abl to com w/ my 3 best frends her at th hom. al 3 r mal, in mid 50s & sufr frm m s, whch hs lft thm unabl to red my com brd. it has brot me untold hrs of joy to be abl to com w/them.
> . . . ablty t sav selectd wrds & letrs [to mk up wrds] on scren -

[16]"by the way."
[17]"praise the Lord."

> so it cn b sen by thos wh hv difclty rembrng begng o wrd or msge. ths is partclrly tru fr thos les eductd, whm del w/ on daly basz, & esp fr thos wh hav ben tught in modrn schl ciriculms . . . ablty t convrs w/kids - tis surprisngly ezy fr thm t undrstnd cuz thy hv bn brot up w/ cmptrs & cn hr synthtc voc clrer

However, as Jane points out in an E-mail message, she couldn't use her Dynavox to communicate with everyone:

> . . . also, for my setng, i e , nrsng hm, mst othr resdnts r eldrly & hrd o hrng, nt to mntn thir inablty to undrstnd syntheszd voic. it seems tht w/ag comz ls of desr to chnge, evn hrng ptrns. . . . and, evn fr ths usd to hrng syntheszd voic, is difclt to stp & rept buz wrd or imp phraz & cant be slod dwn.

Unlike Robillard's means of communication, Jane's Dynavox at least produces an audible voice that must be dealt with by staff—especially when utterances are strategically prepared. In follow-up interviews, Jane stated that she selectively used her Dynavox with fellow residents (like Jake) whose vision was poor and who couldn't read her communication board. When confronted with varying communication situations, Jane would choose the technology best suited for the particular circumstance. For example, once when Jeff was kneeling in front of her chair to attach a remote microphone on her communication device, Jane switched to her Dynavox to talk, then switched to her board when Jeff became available for face-to-face interactions. She employed this strategy on a number of other occasions, depending on Jeff's proximity and focus of attention. Through the coherent pattern of her device selection, Jane aptly demonstrates that there are particular times and particular persons for which a given device will be best suited.

CONCLUSION

As McDermott and Verenne (1995) have noted, questions about the nature of disability "go beyond etiology to function and circumstance" (p. 328) and lead one to ask "When does a physical difference count, under what conditions, and for what reasons?" To answer such a question requires us to situate individuals in their cultural matrix, and to recognize that different cultural matrices (and the individuals that constitute them) are the agents by which certain members of a social group become either enabled or disabled. In this chapter we have attempted to examine how the functions of interactive communication in the circumstances of augmented commu-

nication use are constrained by a socially constructed time matrix for the patterning of American English face-to-face interactions. Augmented interactions often require the participants to negotiate an alternative time order for communication. When such a time order is successfully negotiated by its interactants, it has the positive effect of socially constructing a dynamic, intelligent, communicatively competent individual. However, failure to negotiate an alternate time order means that the very same person may, in another context, be construed as a difficult, suspect, and communicatively incompetent individual. In the preceding discussion, we hope to have demonstrated how the situation, the social matrix, and the nature of the jointly constructed communicative actions conspire to reveal or mask competence, not the individual.

Even from their own perspective, augmented communicators operate under considerable temporal constraints making it difficult, or even impossible, to maintain socially consensual real-time interactions. Such constraints involve body movement, the communication device, and the information-processing abilities of both the augmented speakers and their interlocutor(s). Joint interaction emerges from this set of constraints to operate within a synergistic whole.

As we have shown, the temporal imperative is a dominant feature of face-to-face interaction, influencing and shaping the attention, processing, and communication styles of the participants. The commentaries by Creech, Robillard, and Denton, along with our actual observations of Denton's face-to-face interactions, provide ample evidence that the temporal imperative plays a dominant constraining force throughout the interactive communications of these individuals.

In face-to-face interaction, unlike written communication, the temporal imperative cannot be suspended, and any significant breach or modification of the temporal imperative has significant ramifications on the communication event. The three individuals discussed in this investigation are all highly educated, intelligent, and articulate, as evidenced through their comments and behavior, yet, because of the temporal differences in their augmented interactional abilities as compared to the socially constructed norm, they display difficulty accomplishing otherwise mundane communication goals—such as allocating addressee attention, turn taking, getting one's message out, interrupting, etc. That is, their departures from the temporal norms of mouth-speech communication result in delays, misunderstandings, and other social sanctions. The onus for these is often placed on the shoulders of the augmented speaker.

Although the issue of time and timing in interaction is a joint problem, it is still fruitful to examine possible points in the interactional system that could be improved to ameliorate any difficulties. One aspect that must be tackled concerns the augmentative communication technologies used by

augmented speakers. The input and message display characteristics of these technologies place limits on the speed of message output, the manner and ease of message processing by one's interlocutor, the interactive style that participants must engage in order to converse, and ultimately who one can interact with. These communication technologies impose a significant set of temporal constraints on any interaction and challenge the participants to find ways around those limits.

Slowness in message production leads to frustration, misunderstanding, and reluctance on the part of the addressee to communicate. Delays in message output result in disattention, forgetting, and mishearings on the part of the addressee, and the inability of the communicator to enter into the conversation when temporally mandated. Problems with message revision lead to even longer stretches of frustrating communication repair. The commentaries by Creech, Robillard, and Jane Denton, and our observations of Jane's interactions, evidence both the impact of these constraints and the conscious effort taken by these individuals to develop interactional strategies that compensate for those temporal barriers fostered by their augmented technologies.

The moment-by-moment problems with time and timing experienced by augmented communicators become problems in the presentation of self in at least two senses. First, there is an impact on self-expression. Can you take enough time to say what you want to say without losing or aggravating your addressee? Second, there is an impact on the individual's sense of self. Do your interactions function to alienate you or integrate you within other communities of speakers?

Evidence from all three of the augmented communicators we have discussed in this chapter reveals that disattention by one's interlocutor is very common, as is the reluctance of certain potential interlocutors to enter into conversations. While "[t]he problem of time affects both the person with the speech disability and the communication partner" (Sweidel 1991/1992, p. 203), the social consequences have a greater impact on the former rather than the latter. Even though many of the problems with interaction can be seen to reside in the nature of the communication technologies and/or the inability of addressees to attend to and process augmented speakers' communications, it is augmented speakers who are commonly blamed for failed or "inefficient" communications, and they are the ones who suffer social stigmatization.

Group membership also enters into time and timing issues. In their observations concerning the perspectives taken by "non-disabled people who do not stigmatize, stereotype, and reject those with obvious disabilities," Bogdan and Taylor note the importance of "seeing individuality in the other" and of "defining a social place for the other" (1989, p. 138). As we have seen from Robillard's and Denton's commentaries, the people

who most readily enter into the alternative time order that their augmented interactions require are individuals who already share a considerable amount of cultural common ground with them. It should be obvious that the ability to "define a social place for the other" will be much easier when that individual already has a locus within the local social matrix that one inhabits. There are huge savings in joint time in interactions when both speaker and addressee can presume large amounts of shared background knowledge (communal common ground).

We conclude by returning to one other aspect of group membership that is often taken for granted, but which must be considered more carefully when investigating the cultural matrix of augmented communications. In the introduction we noted that, by being members of the same culture, we are all (both the them and the us) subject to the same institutional reference points, and in our communicative interactions we rely on the same set of unquestioned sociocultural givens. Not surprisingly, it is a fact that with respect to their face-to-face augmented interactions, Creech, Robillard, and Denton also share many of the same beliefs as to what constitutes the nature of effective communication held by other speakers of American English. For instance, Robillard (personal communication, April 1997) states that his choice of device and his temporal problems with regulating interlocutor attention are based, in part, on his own affiliation with the broader community of English speakers and the prominent use of gaze in that community. He writes:

> I think it is a question of membership. I belong to the gaze membership and I equally belong to the notion that others belong to gaze as a method of regulating conversation. There is nothing sacred about gaze. It is only a membership qualification. Of course, this is played out in experience.

The identification and elucidation of such "membership qualifications" and the examination of how they are "played out in experience" must be seen as crucial components in any future investigation of augmented interactions, and in the broader discourse on how communicative competence and incompetence are both socially constructed and deconstructed.

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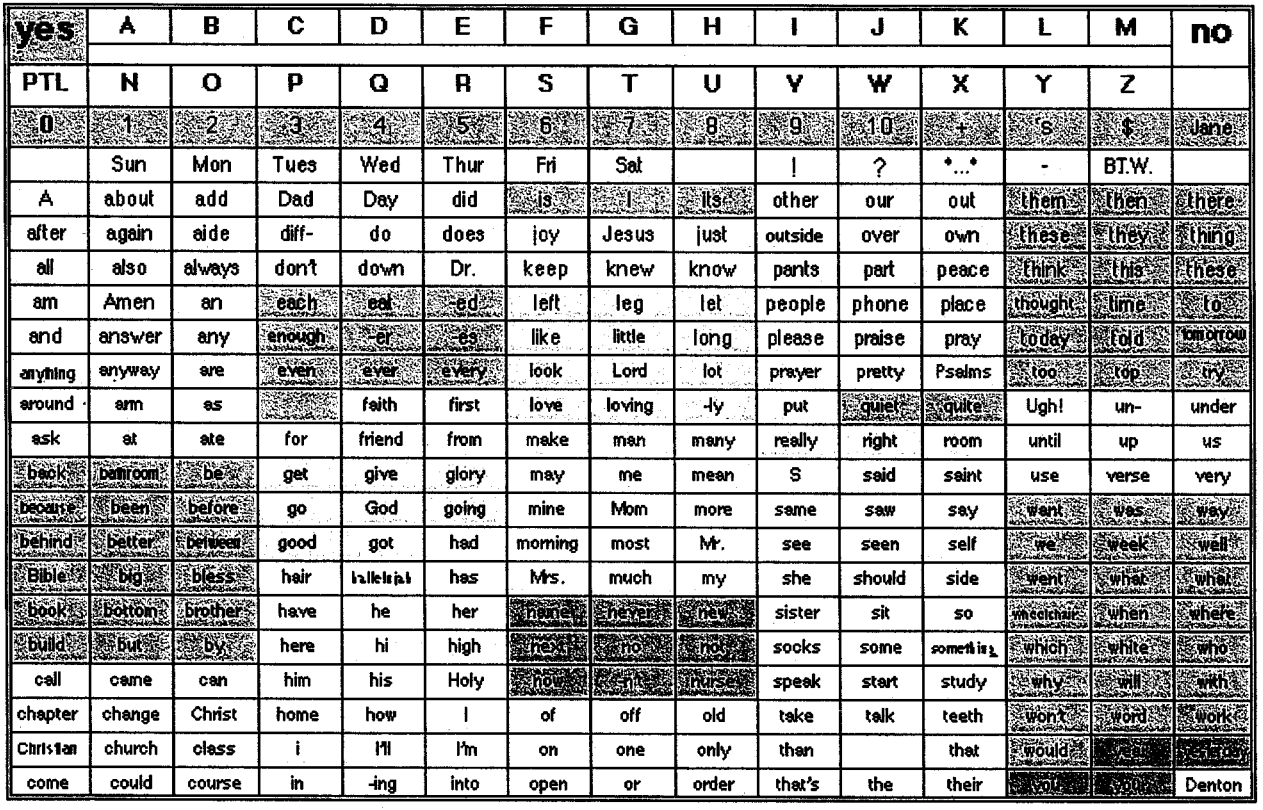

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after	again	aide	diff-	do	does	joy	Jesus	just	outside	over	own	these	they	thing
all	also	always	don't	down	Dr.	keep	knew	know	pants	part	peace	think	this	these
am	Amen	an	each	eat	-ed	left	leg	let	people	phone	place	thought	time	to
and	answer	any	enough	-er	-es	like	little	long	please	praise	pray	today	told	tomorrow
anything	anyway	are	even	ever	every	look	Lord	lot	prayer	pretty	Psalms	too	top	try
around	arm	as		faith	first	love	loving	-ly	put	quiet	quite	Ugh!	un-	under
ask	at	ate	for	friend	from	make	man	many	really	right	room	until	up	us
back	bathroom	be	get	give	glory	may	me	mean	S	said	saint	use	verse	very
because	been	before	go	God	going	mine	Mom	more	same	saw	say	went	was	way
behind	better	between	good	got	had	morning	most	Mr.	see	seen	self	we	week	well
Bible	big	bless	hair	hallelujah	has	Mrs.	much	my	she	should	side	went	what	what
book	bottom	brother	have	he	her	heaven	never	new	sister	sit	so	wheelchair	when	where
build	but	by	here	hi	high	next	no	not	socks	some	something	which	white	who
call	came	can	him	his	Holy	how	can't	nurses	speak	start	study	why	will	with
chapter	change	Christ	home	how	I	of	off	old	take	talk	teeth	won't	word	work
Christian	church	class	i	I'll	I'm	on	one	only	than		that	would	you	yesterday
come	could	course	in	-ing	into	open	or	order	that's	the	their	you	you	Denton

FIG. A.1. Graphic reconstruction of Jane's word and letter board. The original board is color coded.

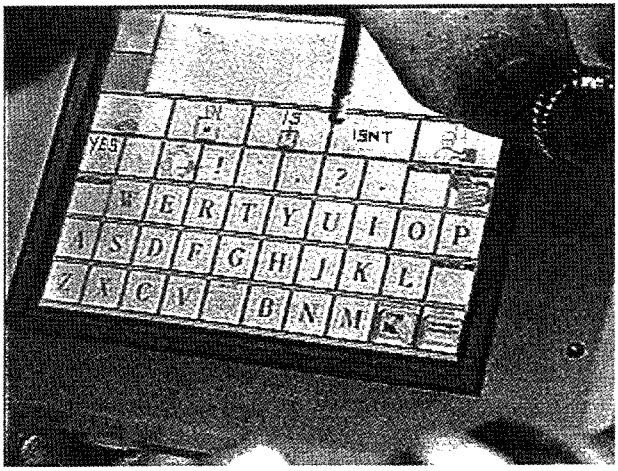

FIG. A.2. Dynavox communicaiton device. Note that the top row presents a new set of "predicted" words after each keystroke.