Discourse Management in Three Modalities

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Abstract

The strategies adopted by dyads engaged in decision-making interactions are compared in face-to-face, synchronous computer mediated, and asynchronous computer mediated (email) communication environments. The results show that the decisions required to plan an awards ceremony were encoded in similar, routine sequences of discourse functions in all three modalities, but the sequences were packaged very differently in the synchronous and asynchronous environments. In face-to-face interaction, short turns rarely encoded more than one or two functions and did not combine decision-making functions and other discourse management functions in the same turn. Many messages in the synchronous computer-mediated environment had the same structure, although some dyads in the synchronous computer-mediated environment interacted using long messages that encoded several functions and combined decision-making functions with other managerial functions. In the email interactions, in contrast, messages were routinely structured so that decision-making functions were preceded and followed by other discourse management functions. Turn-taking is found to be impacted by decision management, transmission management, interpersonal management, and modality. Moreover, the language behaviors that emerged in the asynchronous environment suggest that many features associated with use of the written word are more appropriately understood as characteristic of asynchronous communication.

Introduction

Interaction can be viewed as an activity that participants manage, and discourse management includes management of the resources available for interaction. Machine-mediated communication systems make it possible to observe how participants adapt to different environments with different resources (see, e.g., Anderson, Beard, & Walther, this issue). Moreover, discourse management includes the strategies participants employ to encode their meanings and satisfy their goals as they interact in a variety of environments and contexts. Participants must engage in transmission management to verify that message signals are successfully transmitted and received, to halt and restart transmission (e.g., wait, go ahead), or to facilitate the transmission/reception process. They must manage openings and closings for their interactions (Schegloff, 1968; Schegloff & Sacks, 1973), and these activities require both transmission management to open and close the physical connection and interpersonal management to initiate or conclude a social exchange. In addition to any other goals that participants seek to achieve in their interactions, they also usually have goals such as preservation of face,
expression of solidarity, negotiation or reinforcement of status relations, and formulation of identity, which we call interpersonal management activities.

Discourse management activities are frequently combined. In ordinary conversation, transmissions are synchronized by turn-taking systems (Sacks, Schegloff, & Jefferson, 1974) together with conventions determined by personal, social, and institutional practices. Therefore, turn management in ordinary conversation is also transmission management. Like many managerial activities, turn management can be viewed in terms of the allocation of resources such as the amount of time each participant’s transmission occupies the channel (or holds the floor; see Herring, this issue). Alternatively, turn management can be viewed in terms of how participants encode their activities in appropriately synchronized turns. In either view, to the extent that turn management strategies must be informed and constrained by interpersonal management strategies, the encodings participants select necessarily reflect both kinds of managerial activities in ordinary conversation. The result is an effective communication system in which participants’ contributions can simultaneously function to manage transmission, turn-taking, and interpersonal relations.

Computer-mediated interaction provides the opportunity to investigate discourse management strategies in a variety of communication environments. Following Kiesler, Zubrow, Moses, and Geller (1985), we use the term synchronous to refer to communication in which participants respond immediately to previous turns, as in face-to-face interaction, chat, or instant messaging. In asynchronous communication responses are necessarily delayed, as in letters, email, or voice mail. Prior to the emergence of machine-mediated communication technology, synchronous interaction was primarily spoken, while asynchronous interaction was primarily written. Consequently, contrasts between oral and written communication tend to be confounded with differences between synchronous and asynchronous interaction. The present study begins to tease these variables apart by examining discourse management in three modalities. Participants were asked to complete the same decision-making task in a face-to-face condition, in a synchronous computer-mediated condition, and in an asynchronous, email condition.

In previous research, Condon and Čech (1996b) compared simple decision making interactions in a synchronous computer-mediated condition and a face-to-face condition to assess the influence of machine mediation. We reasoned that participants in the novel computer-mediated condition would alter their discourse management strategies to accommodate features of the unfamiliar medium, but would not abandon fundamental linguistic conventions such as word senses, syntactic structures, or productive discourse routines (Schegloff, 1982, 1986) that create sequential relationships in which each function or act has an expected or unmarked continuation (e.g., question/answer pairs).

Our research provides evidence that decision making interactions are structured into routine sequences of conversational acts or functions and that participants making decisions in synchronous computer-mediated interactions engage in the same routine language behavior as do participants in face-to-face interactions. In the present study, we asked our participants to address a more difficult task in order to observe the effects of
increasing cognitive demands on these managerial strategies. We also added an asynchronous condition in this study to assess the influence of synchronicity on the decision-making interactions. The data suggest that the factor of synchronicity has far more substantial effects on interaction than either the simple fact of machine mediation or the use of written, rather than spoken, language. In addition, turn management remains tied to other discourse management activities, especially transmission management and interpersonal management, in all three modalities.

Features of Computer-Mediated Interaction

A salient feature of much computer-mediated interaction is that it is primarily written, although video conferencing software enabling transmission of acoustic signals is also available. The technology of writing has been associated with social and cognitive transformation by scholars such as Ong (1982), Goody (1977), and Havelock (1963). McLuhan (1962) credits the printing press with the rise of science, industry, logic, capitalism, nationalism, and rationalism. However, Murray (2000) addresses claims that identify the computer with the printing press by arguing that “[s]ocieties adapt new literacy technologies to fit their value systems and practices so that any new medium becomes another part of the web of communication” (p. 54).

Linguistic research that contrasts oral and written communication often uses the term continuum to describe the lack of sharp differences in the forms observed, since speakers and writers combine features of oral and written discourse according to their communicative purposes (Biber, 1988; Tannen, 1982; but see Clark & Brennan, 1991). The continuum is said to include an extreme at which there is a focus on message content, and most relevant contextual information is packaged with the message. In contrast, the other extreme leaves more information understood in the context, and the focus is on interpersonal involvement. Of course, since most naturally-occurring written discourse is asynchronous, the contribution of asynchronicity to the encoding strategies observed has not been assessed. To complicate matters, research on synchronous computer-mediated communication has revealed some features that pattern differently than they do in either ordinary speech or writing (e.g., Ko, 1996; Yates, 1996).

A feature that is shared by all human interaction is the need to package and coordinate transmissions for turn-taking, so that participants can react to each other’s contributions. In a review of the extensive research on turn-taking, pausing, and overlap available at the time, McLaughlin (1984, chapter 3) provides many examples in which turn-taking reflects and combines other discourse management strategies. In face-to-face conversation, precision timing links turns to other signaling systems, especially gaze, kinesic cues, and suprasegmental features such as intonation, volume, and prosody. Discourse markers are also frequently associated with turn boundaries (e.g., Hancock & Dunham, 2001), and discourse factors including participant gender, institutional norms, and cultural values may influence turn-taking strategies. Turn-taking, turn-withholding, and overlap are resources for expression, for topic management, and even for conforming to Gricean maxims of conversational cooperation (Grice, 1975). Turn management
strategies appear to be numerous and complex, yet they are general and flexible enough to adapt to an endless variety of contexts.

Computer-mediated communication (CMC) environments enable investigations of turn-taking and other management strategies under widely varying conditions. Cherny (1999) observes that “users generally send larger messages when they are less likely to get responses quickly: More is accomplished in a single transmission, and the resulting speech exchange is often less interactive, with subsequent long messages less related to preceding messages” (p. 153). Several studies highlight the difficulties of managing interaction, especially turn-taking, in synchronous computer-mediated environments with many participants, and the disruption of adjacency in routine functions such as questions and answers has been cited as an important factor in the reduction of interactional coherence (Cherny, 1999; Garcia & Jacobs, 1998, 1999; Herring, 1999; McKinlay, Procter, Masting, Woodburn, & Arnott, 1994). Nash (2005) examines the cohesion strategies that allow chat users to interact in spite of this incoherence and concludes that the more-frequently adopted types of cohesion tend to be more explicit and carry more information than the less-frequently used types. This observation is consistent with Condon and Čech’s (1996a,b, 2001a) generalization that discourse management strategies are more explicit in computer-mediated environments compared to face-to-face interactions.

Garcia and Jacobs (1999) observe that communication systems in which participants compose messages before sending them are quasi-synchronous compared to systems in which transmission is character-by-character. They attribute the disruption of adjacency in quasi-synchronous interaction to the inability of participants to observe the production of messages in process. Jacobson (1999) quotes an especially perceptive participant from his study whose observations illustrate the strong effects of this factor:

[T]he line-by-line nature of MOO communication smoothes out most minor lags in communication that can be a major part of the impression you form of somebody. A MOO friend whom I've known face-to-face for a number of years tends to be very soft-spoken and thoughtful in real life, but on MOO this is invisible; there's no volume control and, given typing speeds, multitasking and other factors, the pauses for thought are buried amidst the delays of the medium. On occasion I've been on conferencing systems (like UNIX "talk") that are character-by-character. There's definitely a different impression in this sort of communication; the lags in your typing are visible and apparent, and if you're a decently fast typist you have no opportunity to reflect on your words before sending them, no opportunity to see them on the screen and reconsider them. (n.p.)

However, interlocutors in environments that support character-by-character transmission might not attend to the cues that are available. Anderson et al. (this issue) found high levels of overlap when all participants’ messages were transmitted simultaneously with production. In this environment, strategic pauses allowed participants to read messages from others that were transmitted while they were focused on producing their own. Baym
(1996, p. 318) claims that “one of the most significant differences” between face-to-face interaction and the Usenet interaction she analyzed is that “writers and readers are temporally separated.” In synchronous interaction, there is pressure to respond while conversational partners’ attention is directed to the transmission. Moreover, conversational partners not only wait for messages directed to them, but also for the opportunity to take their own turns at talk. In face-to-face interaction, participants must simultaneously interpret incoming messages, plan their own outgoing messages, and identify an appropriate moment in the flow of talk to produce their contributions. The consequence of these processing demands is a preference for turn size to be minimized (Schegloff, 1982). Furthermore, messages lack permanence in synchronous communication: They are usually not saved or revised. In asynchronous communication, in contrast, participants may have not only the time, but also the resources to study and quote the messages they receive and to craft carefully the messages they send. These considerations lead us to expect that synchronous computer-mediated interaction should be more like face-to-face interaction than asynchronous computer-mediated interaction. Similarly, asynchronous computer-mediated interaction should exhibit features that are associated with the written extreme of the oral/written continuum.

Data Collection

In the present study, participants were asked to engage in a task that requires cooperative decision making. Although the interactions are not spontaneous, participants who complete the task achieve all the understandings required to engage in cooperative decision making. By asking participants to engage in the same task and by focusing on the understandings necessary to accomplish that task, we are better able to observe the variety of communicative strategies that emerge and to compare the influence of factors such as synchronicity and machine mediation on those strategies.

Participants in the study were students enrolled in psychology courses at the University of Louisiana/Université des Acadiens who received credit for their participation. Varying combinations of males and females were paired and asked to plan the MTV Video Awards ceremony, which resembles the Academy Awards ceremony. Music videos are nominated for various categories, and the winners are announced by celebrities during a ceremony that includes musical performances, clips of the nominated videos, and so on. The MTV task was selected in part because we thought participants would be more invested in the outcome and would produce more disagreements than previous tasks planning imaginary parties and vacations (Condon & Čech, 1996a,b). In the latter, we hypothesized that participants opted to agree because they did not care about the decisions and wanted only to complete the task as quickly as possible. Since musical preference is tied to personal tastes and identity, we expected more involvement in the MTV task. Furthermore, the very wealthy recording industry and vast patronage of popular music concerts, especially among young people, made it likely that participants would have some familiarity and degree of expertise with relevant contexts. However, disagreements remained rare. It is possible that participants in the MTV task failed to disagree because they wanted to avoid conflict in these sensitive domains. Participants were assigned to one of three conditions. Those in face-to-face interactions were seated at
a table with a tape recorder in the psychology laboratory, and audio recordings were transcribed according to conventions established in Condon and Čech (1992). They generally finished within an hour. Participants for the asynchronous email condition were solicited by announcements distributed to the relevant psychology classes. All students solicited for this condition were already familiar with the email medium. These participants communicated with the experimenter and one another entirely using email (including the initial instructions by the experimenter and the final debriefing once pairs had indicated they were done). They were instructed to send copies of all messages to the experimenter, but they were also asked to save copies of all messages (both those they received and those they sent), and to send these to the experimenter as well. The resulting redundancy has the advantage of increasing the likelihood that all messages are collected and that individuals’ attempts to change the messages that they provide to the experimenter can be detected. No other restrictions were placed on the email communication, except that the task had to be finished by the end of the semester. Students communicated whenever and wherever they chose and used whatever email system they preferred. Most used their accounts on the university’s Unix system.

Participants in the synchronous computer-mediated condition were assigned to a 2-hour session, each in a separate room of the psychology department’s computer lab. They used software designed and implemented specifically for this study by the second author so that the computer-mediated environment would be maximally similar to oral interaction within the constraints of our methodology. For example, participants sent messages to their partners by pressing the ENTER key after they had composed the text, although a word-by-word transmission would more closely approximate oral processing. We opted for well-defined turns because we anticipated future studies in which we would capture and change messages to test hypotheses.

The interface we designed provided a message area in the top portion of the computer screen, a status area in the lower portion, and a brief description of the MTV problem which remained at the bottom of the screen throughout the interaction (see Figure 1). To reduce message permanence, only one partner’s message could appear on the screen at a time. Therefore, messages disappeared as soon as participants began to reply, and if a participant sent a message while the partner was composing one, the interrupting message replaced the composer’s message, although the incomplete message remained in a buffer and did not need to be retyped. In an earlier study (Condon & Čech, 1996a,b), short beeps signaled that the partner was typing a message, but during the delays while messages were typed, participants became anxious that the communication system was malfunctioning and interrupted their partners solely to establish that the system was still operating. To avoid this problem, software in the current study included the status area. As soon as a partner started typing, the recipient’s status area indicated that the partner was working on a message and would be sending it shortly. The text in the status area flashed until the message was sent to reassure participants that the system was active. Thus, participants were able to interrupt, but were less likely to do so for purely phatic reasons.
We also systematically varied the size of the message text area in order to investigate the influence of the window size on messages in synchronous computer-mediated interaction. We were concerned that the relatively small message window in the previous study had influenced participants to adopt strategies that resembled the short turns of face-to-face interaction. Therefore, participants in synchronous computer-mediated interaction were randomly assigned to one of three possible interfaces with different text window sizes; analyses of the window size variable are presented in Čech and Condon (1998, 2001b,c). Although participants were limited to 4-, 10-, or 18-line text windows (a maximum of 80 characters per line), they could send as many transmissions in a row as they desired without waiting for the recipient to reply. In this case, the earlier messages eventually (and irretrievably) scrolled off the screen. Furthermore, the status area on the recipient’s screen changed color and informed the recipient that there was more of the message coming in. Several warning beeps informed participants when they had only one line left in which to complete their messages. In addition, participants could edit their entire text by backspacing. The software stored all keystrokes (including backspaces) and the times at which a message was started and sent, although the partner only received the corrected message. Finally, we provided a digital clock in the top right corner of the screen, as participants sometimes tended to lose track of time: We did not want to have to interrupt the interaction to warn participants that their time was nearly up.

Figure 1. MTV Awards 4-line message area interface
Readers familiar with popular music in the 1990s will recognise that the data for this study were collected in the early 1990s before personal computers were as ubiquitous as they are today. Very few of the volunteers were familiar with the CMC environments available at the time such as IRC, MUDs, MOOs, and Usenet, and relatively few students used email. Consequently, our data capture interlocutors adapting to unfamiliar synchronous communication environments, rather than participating in communicative events with established norms and values.

A Framework for Data Analysis: Discourse Routines

Condon and Čech (1996b) argue that discourse routines are selected in part because understandings and expectations linked to the routine need not be encoded in linguistic form. By conforming to the routine, interlocutors acknowledge their common ground of shared knowledge about what they are doing in the talk (Clark, 1996; Clark & Brennan, 1991; Condon & Čech, 2007; Fetzer & Fischer, 2007). Routines reduce the amount of linguistic form that must be processed and minimize turn size, so that the interaction becomes more efficient. Interactionally, routines establish obligations to produce unmarked continuations, especially in the special case of adjacency pairs (Levinson, 1983; Sacks, 1973), in which the first pair-part produced by one participant requires a second pair-part from another participant, as questions call for answers and requests anticipate compliance. The term participant source will refer to the participant who produces a continuation.

In the data collected for our previous studies using simple decision-making problems, the talk appears to be structured by a decision-making routine which instantiates a more general cognitive schema. Every decision satisfies a goal or need, every proposal must be evaluated, and there must be criteria for determining, from the evaluations, whether the proposal is accepted or rejected. The routine functions that we label Orientations establish a goal for a decision. Suggestions formulate a proposal that satisfies the goal established in the orientation. Agreements and disagreements evaluate the proposal and establish consensus. Participants in the previous studies never discussed the criteria for consensus and they rarely remarked on achievement of consensus, which must be inferred from subsequent talk. Consequently, decisions tended to follow the simple sequence of orientation, suggestion, and agreement.

An annotated example of several routines in face-to-face interaction is provided in (1). The language in face-to-face interactions was transcribed verbatim, but no attempt has been made to record intonation, stress, or prosodic information, except that question marks are used to indicate question intonation, and ellipses represent pauses. These data are labelled “(o)” to signal that the interaction was oral.

(1)  a. P1: [orientation] who’s going to win?
    [suggestion] Mariah?*
    b. P2: [agreement] yeah probably
    c. P1: [orientation] alright Mariah wins what song?
    d. P2: [suggestion] uh Fantasy or whatever?
e. P1: [agreement] that’s it that’s the same song I was thinking of
[orientation] alright alternative?
[suggestion] Alanis? (o)

The annotated example in (2) illustrates several routines in a 18-line, synchronous computer-mediated interaction. Data from computer-mediated interactions are presented as they appeared to the conversational partner, except for line breaks and fonts. We do not attempt to normalize spelling or call attention to departures from spelling and punctuation conventions. Data from synchronous computer-mediated interactions are labeled “(s)”, while data from asynchronous computer-mediated interactions are labeled “(a)”.

(2) a. P1: [orientation] who should win best alternative video.
   b. P2: [suggestion] Pres. of the united states
   c. P1: [agreement] ok
   d. P2: [orientation] who else should we nominate.
      [suggestion] bush. goo-goodolls and oasis
   e. P1: [agreement] sounds good, [...] (s)

In addition to presenting sequences of turns in synchronous interactions like (1) and (2), we sometimes provide a list of examples from different participants in different interactions. In these cases, the “P1” and “P2” labels are omitted. Also, since some turns are quite long, we may omit irrelevant portions. These are indicated with ellipses in square brackets.

Condon and Čech (1996b) use the term compression to describe the fact that participants in synchronous computer-mediated interaction use an average of five times fewer utterances to complete the same tasks, more utterances that conform to discourse routines, and more utterances that combine several functions. The participants in (3) have established an even more compressed routine than we typically see in the 1996 data.

(3) a. P1: [orientation] WHAT DAY
   b. P2: [suggestion] Sunday
   c. P1: [orientation] ACTIVITIES AND ENTERTAINMENT
   d. P2: [suggestion] touchfootball,volleyball,softball
   e. P1: [orientation] ENTERTAINMENT
   f. P2: [suggestion] we could hire a magician and comedian (s)

Orientations and suggestions are reduced to bare nominals in (3c,e), and the agreement function is not encoded at all as participants move directly from suggestions (3b,d) to the next orientations (3c,e). By relying on the understanding that routine continuations need not be encoded in linguistic form, they manage to achieve decisions using the minimum encoding possible. Because P1 responds to P2’s suggestions by orienting the next decision, the unmarked default is that P1 agrees with the suggestions. It is difficult to imagine how the task could be accomplished with any less language. Finally, routines may specify the participant source of continuations. For example, for the typical decision
routine, the agreement continuation of a suggestion should be provided by a different participant than the suggestion, exactly as in an adjacency pair, whereas no participant source is specified for suggestions that continue orientations. Participants frequently formulate both an orientation and a suggestion that satisfies the orientation, as in (1a,e) and (2d). In contrast, the compressed routine in (3) works only if orientations and suggestions are produced by different participants. Therefore, turn management is constrained by the decision routine. These two types of management—decision and turn management—will focus our analysis of discourse management in the three modalities.

Decision Management in Face-to-Face Interactions

Since participants' primary concern is completing the task, we assume that their primary managerial problem is management of decision routines, and we can observe that much of this work is accomplished in what we call the orientation function that typically initiates each routine. At the same time that orienting sequences establish goals for subsequent suggestions, they also locate the talk within the structure of subtasks that evolves as the discourse proceeds. Therefore, they play an important role in satisfying the cognitive demands of the task. In addition, orientations serve an important interactional function by initiating a decision routine, which calls for the orientation to be continued by a suggestion. Orientations direct the talk, in the sense that participants must either formulate the default continuation and produce a suggestion that satisfies the goal expressed in the orientation or else interrupt the flow of talk with a sufficient expenditure of linguistic form to express the desired marked function. Therefore, orientations seem to be a locus of discourse management activities in these interactions.

Face-to-face participants encode orientation in a variety of structures, which are often prefaced by discourse markers. Orientations typically occur as fronted adverbials (4a), short noun phrases (4b,c), need statements (d,e), requests for information (4f-h), and combinations of these (4i). When orientations are encoded as statements and short phrases, the suggestion is often formulated by the same speaker, as in (4b), although the orienting phrase might also stand alone as an invitation for a suggestion from another participant (4c).

(4)  a. and then for like alternative groups we have Bush and 311 and... (o)
b. and then male vocalist...Vince Gill definitely has to be in there (o)
c. ok..uh..song of the year (o)
d. ok now we need an opening act (o)
e. now we need one more band that uh that’s gonna end the show (o)
f. who presents? (o)
g. and who would present that? (o)
h. who’s going to be the winner? (o)
i. ok entertainer of the year uh who will be the nominees? [...] (o)
By formulating orientations as a requesting first pair-part, participants both reinforce the obligation to provide a suggestion and, in most cases, transfer the obligation to the partner. Although the decision routine does not specify a participant source for suggestions, the request routine requires that compliance be expressed by a different participant. Therefore, encoding orientations and suggestions as requests and compliances performs both decision and turn management. In fact, interrogative orientations not only structure the talk into turns, but also provide an opportunity to select the next speaker in interactions where there are more than two participants (Condon, 1986).

Orientations are less frequently structured into adjacency pairs by a strategy of expressing orientations as requests for action. Some examples are provided in (5).

(5) a. we got to do one more category (o)  
b. we have to decide who’s going to win this too (o)  
c. you choose the woman (o)  
d. don’t forget there’s an opening act (o)

Utterances like (5a,b) refer to the decision making interaction itself. They are the most overtly managerial strategies that participants adopt, because they explicitly direct the talk. These requests have the distinguishing property that no single person can perform a single action to comply with the request. Instead, compliance must be achieved by cooperative effort from participants in a sequence of utterances, specifically a suggestion and agreement. Furthermore, participants who produce requests like (5c) actually change the decision routine itself by approving their partner’s choices in advance.

We categorize as orientation utterances that establish a goal for a single decision and call for a suggestion. Example (6) shows that requests for action may also be used to establish a structure of subtasks.

(6) a. so we gotta pick three and then choose one out of that (o)  
b. [...] um what’s the first one...the categories are first so we’ll do it in order (o)  
c. we have to pick a number of categories and decide who the nominees ought to be there’s usually three  
d. I’ll pick the man you pick the two women (o)

We will use the term serial for management strategies in which no attempt is made to orient more than one decision at a time, in contrast to hierarchical strategies in which a sequence of decisions is proposed, as in (6). Participants often engage in hierarchical management strategies at the beginning of the interaction, since the dependencies among decisions in the MTV task make the choice of a starting point likely to affect sequences of decisions. Otherwise hierarchical strategies like (6) are relatively infrequent in the face-to-face interactions, and most decision management is accomplished using a serial
management strategy with orientations that are not explicit requests for action. While most decision making conforms to the typical routine described in Figure 1, the orientation-suggestion-agreement sequence is frequently interrupted by insertion sequences that clarify or further specify orientations, that identify performers and songs, and that express participants’ difficulty remembering names. For example, sequences like (7) show how making a suggestion can become quite complex.

(7) a. P1: who’s the who’s the guy that uh the bald head?
   b. P2: Kevin Sharp
   c. P1: Kevin Sharp
   d. P2: what does he sing?
   e. P1: uh like uh that song
   f. P2: he remade it
   g. P1: remade it from uh an r & b song uh I’m trying to sing it
   h. P2: yeah me too it’s like “these two walls are”
   i. P1: yeah uh
   j. P2: “I’m dying insi--nobody knows” [laugh]
   k. P1: “nobody knows” that’s it “Nobody Knows It But Me”
   l. P2: ok and
   m. P1: and um what’s the third one? let’s see (o)

P1 initiates the suggestion in (7a), but P2 does not agree until (7l), and there is considerable overlapping of speech in (7c-f) as well as in (7j-m). Moreover, (7m) illustrates how the cognitive context provided by the routine and the interactional obligation to continue an orientation can extend across many turns (see also the discussion of side sequences in Clark & Schaefer, 1989). The orientation for the suggestion in (7)—nominees for song of the year—is separated from (7) by eight turns during which the first nominee is established. The exchanges in (7a-l) then establish the second nominee without additional orientation. However, for the third nominee, another orientation is encoded in (7m), relying on the previous orientation to establish a referent for one.

Example (7) also illustrates how a hierarchical structuring of decisions can emerge without explicit encodings like the requests in (6). The task of selecting nominees for song of the year requires suggesting and agreeing on several titles. Instead of a complete orientation-suggestion-agreement sequence for each nominee, it is possible to employ a more parallel organization in which a single orientation holds for more than one suggestion and agreement. An even more parallel arrangement would associate more than one suggestion with a single orientation and a single agreement, which is essentially what happens on the many occasions when an orientation for nominees in some category is continued by a list of names. Just as the complex structure of the MTV task results in hierarchical strategies at the beginnings of interactions, it also seems to encourage more parallel decision sequences than the simpler tasks used in previous studies. Nevertheless, most decisions are accomplished in serial routines with neither hierarchical nor parallel strategies.
Turn Management in Face-To-Face Interactions

In ordinary conversation, turn management is also transmission management, and it is rare to observe explicit transmission management in ordinary conversation. In fact, the pressures to minimize turn size seem to force a preference for achieving understandings without explicitly referring to the talk, which requires additional expenditures of linguistic resources. In accord with relevance theory (e.g., Sperber & Wilson, 1995, 2004), utterances typically provide the optimal and minimal information necessary. As in ordinary conversation, explicit talk about the talk is rare in the face-to-face decision making interactions, especially talk about transmission management, and turn size is usually kept to a minimum. For the MTV task, the average turn size among the eight interactions in the face-to-face condition is 8.6 words per turn, compared to an average 6.4 words per turn for the interactions in the face-to-face conditions of the 1996 study involving simpler decision problems. The examples in the previous section are representative of turn sizes. Many turns consist of only a few words, although turns of 10-20 words occur with regularity. It is extremely rare for turns to exceed 40 words, and these few are all clearly exceptional in some way. For example, one extended turn occurred when a participant narrated the events that took place in a video in order to prove that she had seen it. Another example is (8), which includes the transmission management device wait.

(8) um we have to decide what clips to show and the nominees wait the presenters you think we ought to back up and to each everything in each group like we started with female vocalist of the year go back and say who would be presenting and what clips to show (o)

The complex management activities reflected in (8) clearly presented encoding problems for the participant, as evidenced by the self-repair in “each everything in each” and by the strategy of providing additional context (“like we started with female vocalist of the year”).

Turns usually express no more than one or two routine functions, although it is possible for a single participant to express an agreement, an orientation, and a suggestion in one turn, as in (1e). Turns that encode nonroutine, explicit management functions like (8) rarely include utterances functioning as suggestions or orientations and vice versa. Turns are typically lengthened by expressions of opinions and attempts to remember or identify referents. (9) illustrates an example in which both occur, resulting in a turn that exceeds 40 words.

(9) I know we have Alabama didn’t we have Alabama presenting? but maybe they should be in there even though they’re old because you know they just came out with that new song what’s that new song? something like “The Maker Said Take Her” have you heard that song? (o)

In addition to transmission management, turn management involves decision management and interpersonal management. Hierarchical decision management
strategies may affect turn management by specifying which participant is obligated to provide specific suggestions, and agreements must be formulated by a different participant than the suggestion provider in the typical decision routine. We saw that orientations encoded as first pair-parts manage turn-taking by creating an obligation for the partner to provide a suggestion. The term source negotiation can be used for activities that determine which participant will encode a function in the routine. Occasionally, source negotiation becomes explicit and participants produce forms like you decide, which also changes the decision routine. More typical is the source negotiation accomplished in orientations, such as the participant who produced every orientation in the interaction and elicited almost every suggestion from the partner. This example shows how the interpersonal consequences of turn allocation are reflected not only in turn frequency or size, but also in turn function.

Decision Management in Synchronous Computer-Mediated Interaction

What is remarkable about the synchronous computer-mediated interactions is the rich variety of strategies participants employ in the unfamiliar environment and the adaptability they reflect. For example, orientations are encoded using the same strategies observed in face-to-face interactions: fronted adverbials (10a,b), phrasal units (10c-e), need statements (10f,g), and requests for information (10h-j).

(10) a. For people to present the awards let’s use the “Friends” crew for one, [...] (s)
    b. [...] and after that award we could have the people who sing that song [...] (s)
    c. Nominees: Michael Bolton Sammy Kershaw M.O.S. [...] (s)
    d. I agree. Now to best alternative video. I think Bush should definately win [...] (s)
    e. the winner smashing pumpkins (s)
    f. [...] we need more groups to be nominated for the second category (s)
    g. O.K. Now we need Best Heavy Metal Group [...] (s)
    h. ALL RIGHT WHO DO YOU WANT IN THE ROCK CATEGORY (s)
    i. ok. who up for R/B? (s)
    j. [...] 2Pac for “California Love” and ? (s)

Although intonation and prosody are not available, participants use other resources, such as the punctuation and spacing in (10c-e) and the flexible wh-in-situ⁶ structure afforded by the question mark in (10j).

Explicit decision management strategies encoded in request forms such as the examples in (11) occur more frequently than in face-to-face interaction, especially strategies like (11d) that incorporate source negotiation.

(11) a. Actually we need to start figuring out who the presenters are too (s)
    b. [...] Let's move on to the opening and performing bands time is short (s)
    c. ok, now we need to decide another band to perform. (s)
    d. how about if you pick two categories and I’ll pick two also making it a total of 4. [...] (s)
The average proportion per interaction of utterances encoding explicit decision management in the synchronous computer-mediated interactions is .08, whereas the comparable proportion in the face-to-face interactions is .03 (Condon & Čech, 2001a). Source negotiation also becomes more explicit, as illustrated in (12).

(12) a. [...] I can’t think of any more could you please help me out. (s)
    b. name some songs (s)
    c. Give some suggestions (s)
    d. suggestions (s)
    e. ANOTHER CATEGORY (s)

In each example of (12a-d), the orientation portion of the routine has been completed in a previous utterance, making formulation of a suggestion the unmarked continuation. There is no need to explicitly call for suggestions, and it appears that the requests function primarily to deflect (or defer) the obligation to provide a suggestion. Consequently, as we observed in face-to-face interaction, a discussion of decision management necessarily becomes a discussion of turn management and, ultimately, interpersonal management.

Two different decision management strategies observed in the synchronous computer-mediated interactions directly influence turn size. In one strategy, the interactions resemble face-to-face interactions with primarily serial decision routines and relatively short turns that do not combine decision making functions with explicit managerial functions. When participants adopt the short turn strategy, compressed routines like the one illustrated in (13) emerge.

(13) a. P2: IWOULD HAVE TO SAY ALANIS AGAIN  
    b. P1: me too  
    c. P2: OK HOW ABOUT BEST MALE VIDEO  
    d. P1: coolio, i guess  
    e. P2: OK AND TOM PETTY AND I DON'T KNOW  
    f. P1: i like coolio better  
    g. P2: YEAH ME TOO  
    h. P1: what is nexy  
    i. P2: BEST RAP VIDEO  
    j. P1: i dont know whatever you think  
    k. P2: BONE, UGK, 2PAC, THE FUGEES  
    l. P1: bone  
    m. P2: YES THAT IS MY CHOICE TOO  
    n. P1: ok  
    o. P2: NEXT IS BEST METAL VIDEO  
    p. P1: suggestions  
    q. P2: METALLICA, RAGE, NIN  
    r. P1: rage  
    s. P2: YEAH THEY ARE PRETTY GOOD (s)
(13a-g) show that the participants have developed a pattern in which both participants offer suggestions for a category and then one participant identifies one of the nominees as a choice for the winner, as in (13a,f,l,r). The choice of a winner following the choice of nominees has become routinized, with the consequence that little or no linguistic form must be added to the nominee’s name for the utterance to count as a suggestion for the winner. In the pattern that has emerged by (13g), suggestions of nominees may (13e) or may not (13f) receive agreements, but the suggestion for a winner always does (13b,g). By (13l), this pattern is compressed into a routine in which one participant’s choice of nominees is continued by the other participant’s choice for a winner, which is followed by an agreement with the suggestion for a winner. The only variation occurs in participant sources for the orientation and suggestion functions, which is negotiated in forms like (13j) and (13p). Participants continue to rely on this routine for more decision making, which is not surprising, since it is an excellent example of how discourse can be compressed by establishing a routine.

The compression and short turns in (13) contrast dramatically with the messages produced by participants who adopt the parallel, long turn strategy. (14) provides examples of these turns.

(14) a. Best Female Video Either we could have Celine Dione's song I'ts all coming back to me or the other one that was in that movie up close and personal. Any of the clips with her in them would be good. Toni Braxton with that song...gosh I can't think of any of the names of anybody's songs. And show the same clip as before. What about jewel. Who will save your soul. Personally I think she should win we could use the clip of her playing the guitar in the bathroom. We need one more female singer. Did we pick who should present the award? I think Bush should play after the award. (s)

b. I agree with you. I'm not sure if you got the message that I just tried to send, but I accidentally pressed "enter" before I had finished. Anyway, so we've got our host. Now we've got to get nominees for our categories. With alternative we could use Bush, Goo Goo Dolls, and Presidents of the United States of America. With pop we could use (but of course) Hootie and the Blowfish, Mariah Carey, and Natalie Merchant. You can pick the nominees for best video. For opening act I say we should get Hootie just because everyone loves them. How many more categories are there? (s)

When parallel strategies are adopted, more than one decision is managed in a single turn by encoding several orientations and suggestions. For example, in (14a), the participant orients decisions for best female video and encodes three suggestions for nominees, each specifying the clip to be shown during the ceremony. In addition, the participant orients a suggestion for another nominee, performs additional decision management by asking Did we pick who should present the award? and makes a final suggestion. Long turns also include both routine decision making and nonroutine managerial activities like the transmission management in (15b). In synchronous interaction, there ought to be an upper limit on the number of functions that can be accomplished in a single turn, since the
partner must be able to remember everything accomplished in the long turn in order to respond appropriately. But the computer-mediated interactions push this limit up by providing an external text that helps circumvent short-term memory limitations. Although the text did disappear the moment a participant started typing a response, it was available for repeated consultation in the initial planning of that response. Interlocutors who adopted the long turn strategy made their communication less synchronous, which accommodated a dramatic change in the form and structure of the interaction.

**Turn Management in Synchronous Computer-Mediated Interaction**

Evidently, the minimal message permanence and asynchronicity afforded by the communication software made it possible for participants to adopt parallel decision strategies that would be untenable in face-to-face interaction, but it is unlikely that asynchronicity causes or motivates participants to adopt parallel decision strategies. Instead, there are good managerial reasons to select parallel strategies, such as the tendency for the complex task to encourage parallelism already observed in face-to-face interaction. Even stronger motivation for adopting parallel strategies is the fact that they decrease the number of turns required to make decisions, since a single agreement can apply to several decisions instead of a single one. This option is attractive in an environment that makes turn and transmission management difficult.

Evidence that participants experience difficulty in turn and transmission management can be found in the frequent occurrence of explicit management strategies. Increases in explicit source negotiation have already been observed, and message transmission also frequently becomes a topic for the talk, as illustrated in (15). The average proportion of utterances engaged in explicit transmission management is .02 per synchronous computer-mediated interaction, compared to an average <.005 per face-to-face interaction (Condon & Čech, 2001a). For example, phatic expressions like (15a-d) function to ensure that the communication system is operating, that the partner is still engaged in the interaction, and probably also to urge the partner to speed up transmission.

$$\text{(15) a. are you calling me? (s) b. are you receiving these messages (s) c. are you there? (s) d. hello (s) e. [...] Do you find this computer is slow in sending the messages, or are we slow in typing??? (s) f. Damn I can’t get this Shit down. [...] (s) g. [responds to are you still there] yes I am I was just rereading everything [...] (s) h. O.k. but try not to type when I type if you are, cause it messes up my screen for some reason. I think that it is good. I also think that Crossroads should win (s)$$

Examples (14b) and (15e-h) show that problems in message transmission and synchronization led to repairs and frustration. However, several dyads completed the task without a single reference to message transmission, and some participants waited patiently for turns that took eight minutes to appear, while others produced expressions like (15b-d) after waiting only 44 seconds. (14b) and (15h) also illustrate how long turns
can include both explicit management activities and decision activities, which is rare in face-to-face interaction.

Compression may also motivate selection of parallel strategies. Long turn strategies can produce compression effects that are as strong as those observed in short turn strategies. For example, with turn boundaries defined at participant changes, the interaction with the lowest average words per turn (6.31) employed 67 turns and 423 total words, while the interaction with the highest average words per turn (97) employed 5 turns and 485 total words. In contrast, the average number of words per interaction for the 60 synchronous computer-mediated interactions is 861 words.

Finally, the text window size might influence turn size preferences, although these results do not reflect any simple effects. The average per interaction of 18.7 words per turn in the 4-line condition is significantly less than the comparable turn sizes in the 10- and 18-line conditions according to Welch’s W, which does not assume equal variance in the three conditions ($W(2,29)=3.77$, $p<.05$). The 10- and 18-line conditions average 29.2 and 29.9 words per turn respectively, and the difference does not reach significance (Čech & Condon, 1998, 2001b,c). The eight interactions with the lowest average turn sizes are distributed fairly evenly across the three conditions: three in the 4-line condition, three in the 10-line condition, and two in the 18-line condition. In contrast, only one of the eight interactions with the highest average turn sizes occurs in the 4-line condition, while the four with the highest averages occur in the 18-line condition. Therefore, text window size may affect turn length differently depending on whether short or long turn sizes are selected. If participants adopt short turn strategies, increases in text window size are irrelevant, since the goal is to minimize turn size. However, if participants adopt long turn strategies, then larger text windows seem to encourage longer turns.

The synchronous computer-mediated interactions underscore the interaction between turn management and interpersonal management. Not only do we find relatively high frequencies of explicit source negotiation, but also the interpersonal consequences of turn and source allocation are made explicit. For example, (16a-c,f) reveal personal information and introduce personal factors such as expertise.

(16)  
a.  [...] Do you have any ideas? I seem to draw a blank on his one. [...]  
b.  O.k, I’m a little out of date with R and B lately so you can pick these.  
c.  You chose I can’t think of any one  
d.  [...] Your turn.  
e.  Wait a minute don’t make me do all the work. Have some input into this please  
f.  I really don't know that much about rap so why don't I make up a list of country groups and songs and pick a winner and you do one for rap or something else!

(16d,e) illustrate participants’ concern to equalize participation, which foregrounds their obligations in the cooperative task and makes determining participant sources an interpersonal activity. Yet managing participation often amounts to managing turn-taking
in these interactions, and it may even be combined with management of decision routines, as in (16f), by devising novel structures of decision-making functions in which participant source is specified. Most of the interpersonal work that occurs in the interactions is accomplished in these subtle negotiations, rather than by explicitly providing or eliciting personal information, except for the obligatory descriptions of music preferences.

Finally, the parallel management strategies that emerge in the synchronous computer-mediated condition directly affect the adjacency of pair parts and other routine continuations. We use *strict adjacency* for the relation between an utterance and the continuation that immediately follows regardless of turn changes and *turn adjacency* for a continuation contained within the turn that immediately follows. *Strict turn adjacency* will refer to an utterance and a continuation that immediately follows as the first utterance of the next turn. In ordinary conversation, first and second pair-parts are usually strictly turn adjacent, since the second pair-part is produced by a different speaker than the first pair-part. But if several first pair-parts are included in a long turn, it is not possible for more than one to have a second pair-part which is strictly turn adjacent. The remainder of first and second pair-parts would be only turn adjacent. Therefore, parallel management strategies favor the looser turn adjacency over stricter defaults for routine continuations.

**Decision Management in Asynchronous Computer-Mediated Interactions**

The email interactions resemble the synchronous computer-mediated interactions with respect to machine mediation, but with the significant difference that participants are no longer under pressure to respond while the partner waits. Not only do participants have as much time as they desire to read and compose messages, but they also can consult their records of previous messages. Consequently, the cognitive demands of the task are altered, and turn size is even less constrained by the limitations of working memory. In the absence of the cognitive and interactional demands that pressure participants in the synchronous conditions to use strategies that increase the efficiency of the communication, different encoding strategies are expected. To facilitate comparison with the synchronous conditions, the term *turn* will be used to refer to the individual email messages, along with the term *message*.

Orientation strategies in the asynchronous interactions are as varied as they are in the synchronous ones, including orientations expressed as noun and prepositional phrases, as fronted adverbials, as requests for information, as need statements or questions, and as requests for action. However, orientations in the asynchronous interactions tend to be more elaborate (17a,c), and participants frequently introduce parallel sequences of orientations and suggestions using an explicit reference that identifies them as suggestions (17b-e).

(17) a. [...] As far as the guy to present heavy metal and rap... [...] (a)
b. [...] Well, here's my suggestions for the Mock MTV show: [...] (a)
c. [...] Now the time thing I kinda just went on a rampage...i mean the idea came and I just sat and worked it out. Here's what I came up with: [...] (a)
Since participants are performing routine functions, there should not be a need to identify the functions of utterances serving as suggestions, as in (17b-e). Instead, understandings which ordinarily remain tacit in synchronous interaction are made explicit in the asynchronous modality. These seem to be two factors that condition orientations like (17). One may be a perceived need to provide a transition from the managerial functions that usually precede the decision roles in asynchronous turns (see discussion of turn management below). Another factor is the complex structure of orientations and suggestions that utterances like (17b-e) may introduce. (18) shows how one participant used spacing, capital letters, and punctuation to establish the structure and sequence of suggestions.

(18) NOMINEES:
  RAP: Above the law, 2pac, Ol' Dirty bastard
  R&B, - R Kelly, Jodeci, Subway
  POP, - Micheal Jackson, Amy grant, Sheryl Crow
  COUNTRY, Faith Hill, Shania Twain, Garth Brooks, Pam Tillis
  ALTERNATIVE Green day - Pearl Jam, STone Temple Pilots.

Many participants in the asynchronous interactions use spatial orientation on the screen as a resource to structure orientations and suggestions. In fact, this strategy even emerged in the synchronous computer-mediated interactions, where the “Return” key in our initial interface was the “Enter” key that participants press to send their messages. Thus, in the latter, participants actually had to insert spaces to move to the beginning of a new line to use spatial orientation. Only two participants attempted this, but their persistence in making use of this resource in spite of the difficulty suggests that there is strong motivation for using this strategy. It is an efficient way of indicating the placement of information in a hierarchical goal-structure composed of a series of subgoals. In this case, spatial location provides a readily-encoded cue about the subgoal(s) under discussion that nicely meets the maxim of relevance (Grice, 1975) with a minimum of linguistic form.

While participants in the synchronous computer-mediated interactions expend more linguistic form on managerial functions than in face-to-face conditions, the asynchronous interactions are even more extreme in this respect. As we saw in (17), understandings which ordinarily remain tacit in face-to-face interaction are made explicit in the asynchronous context, and participants often refer to the thought processes involved in making their decisions, as in (17c) and (19).

(19) a. [...] I am going to try to think of a newcomer for the pop group when I get home [...] (a)
  b. [...] I haven’t given it a whole lot of thought yet. [...] (a)
  c. [...] Also, I started to think about the categories. [...] (a)
In the synchronous interactions, references to mental states primarily express participants’ difficulty remembering names, and think is usually used with a clausal complement (I think that...). In contrast, participants in asynchronous interaction frequently talk about what they have been thinking about or will be thinking about, and they are also more likely to explicitly solicit the partner’s “thoughts.” Similarly, keying devices become more explicit with use of emoticons and expressions like those in (20).

(20) a. [...] (ok, seriously) [...] (a)
b. [...] (just joking) [...] (a)

However, other nonroutine activities observed in synchronous interactions occur only rarely in the asynchronous interactions. Repair and phatic expressions like are you there? are rare in the asynchronous interactions. The difficulties of message/turn management experienced in the synchronous condition are absent in the asynchronous environment, although considerable amounts of linguistic form are still expended on management of message transmission in the asynchronous condition. Finally, management of participant roles is more likely to be negotiated using explicit, hierarchical strategies, as illustrated in (21).

(21) a. [...] I will leave it up to you to pick the winners of these categories. [...] (a)
b. [...] I will take the rap, r & b, and pop categories and decide the winning group, album, and song. You handle the metal, alternative, and rock. [...] (a)

Turn Management in Asynchronous Computer-Mediated Interaction

The most remarkable feature of the asynchronous interaction is the homogeneity of turn structures, which are strikingly similar to the structures Herring (1996) observes in messages posted to electronic discussion groups. Herring observes five recurrent macrosegments, of which the first and last are labeled epistolary conventions, referring to the salutation and complimentary close-plus-signature. In the typical structures that Herring describes, salutations are followed by introductions, bodies, and closings respectively. The generalization we make about message structures in the email condition is that routine decision making functions occur in the middles (like Herring’s bodies), while discourse management activities precede and follow. This sandwich structure matches the one Herring describes, because in our view epistolary conventions are routine encodings for the management activities of opening and closing message turns in asynchronous written interaction. Participants in the email condition treat each message as a sequence that must be opened and closed, and they seem to adapt familiar routines and encoding strategies such as epistolary conventions to manage these activities. In fact, Herring (1996, p. 88) makes a similar observation about opening sequences in her data. Although postings to electronic discussion groups tend to be impersonal, she points out that a majority of introductions involve mentioning a participant by name, which she calls interpersonal introductions, and she compares this to the interpersonal management activities found in conversational openings and the lead-ins of letters. Both the introduction and closing macrostructures that Herring identifies include functions that we associate with discourse management, especially interpersonal management activities
such as the apologies, chastisements, and appeals that Herring (1996, p. 90) observes at the ends of messages. In our data, messages typically begin with a greeting followed by an introductory portion with a high density of managerial functions. Some examples are given in (22).

(22) a. Hi Michelle! Don't worry about not writing sooner, Dr. Čech told us to take our time. I know how expensive AOL gets that's why I cancelled it!! :-) Anyway, to answer your questions, [...] (a)
   b. Tom, I like your choices. You could've taken one of the other categories if you wanted to, to distribute the work better, but anyway, here's my shot. (a)
   c. I just realized that there are some errors in my typing in the last email I sent (a)
   d. Hey, How are you doing? I've been working on my reasearch paper. I've come up with a little more. I can not find my paper with the winners that we chose (a)

As (22a,c) illustrate, management of message transmission is often the first topic addressed in the complex asynchronous turns. It is also often the last topic addressed, as in (23).

(23) a. [...] I'll talk to you next time. (a)
   b. [...] I guess I'll hear from you on Friday or Wednesday. (a)
   c. [...] Write back when you can! (a)

Similarly, management of decision sequences often occurs in the introductory portion of the message (22b, 24a,b), as well as in the closing (24c-e).

(24) a. hey , well i think that we should start setting up the catagories and bands and all. [...] (a)
   b. Hey Traci !! How was your holiday? I really enjoyed mine. I think i’ll choose Soop. i guess we need to decide in what order we want the presenter , bands, and best vocalists. I thought about nominees for best female vocalist: [...] (a)
   c. [...] Please let me know what you think of all this...and I'll be giving you the last of my nominations in a bit. (a)
   d. [...] I think one thing that we need to watch, because I know that I have this tendency, is to make sure that we do not make the show too alternative. They usually have a pepretty balanced mix. Anyway, I look forward to your feedback/suggestions. Have a great day! (a)
   e. [...] That pretty much does it for right now, so think about it and let me know your decisions, and I will let you know mine. (a)

Pleasantries are also typically exchanged in both the introductory and closing portions of the turn, as (22d) and (24b) do at the beginning and (24d) and (25) do at the ends of messages.

(25) a. [...] I hope you have a nice Easter vacation and drive safely. (a)
   b. [...] Good Luck on Finals. (a)
Therefore, transmission management and interpersonal management activities are both reflected in explicit encodings in the email messages.

Finally, the function that Herring (1996) observed most frequently in the introduction macrostructure was a link to the previous discourse. Interactions from the MTV task illustrate at least two different ways that turns are linked to previous turns. One type of link is created by the unmarked continuations associated with routines. Participants still rely on routine continuations, even though the parallel strategies in the email turn structure force interlocutors to substitute turn adjacency for the stricter adjacency observed in most face-to-face routines. The links to previous turns that occur in the introductory portions of the email messages are often unmarked continuations of routine functions such as agreements (22b), answers to questions (22a), or suggestions produced in response to orientation strategies (24b). Ordinarily, decision functions like suggesting and agreeing occur in the middle portions of messages, yet we have many examples, including some in the log turns of the synchronous computer-mediated interactions, in which an agreement precedes managerial activities at the beginning of the turn. The likely explanation is that placing routine continuations at the beginnings of turns is a managerial strategy that satisfies the strong preference Herring observes for openings to include a link to the previous discourse. As unmarked continuations, second pair-parts create textual ties that are implicit in the sense that previous discourse is not explicitly referred to in the talk. The other strategy that participants use to link their messages to previous ones employs an explicit reference to the previous message (22a,c), and all but one of the examples that Herring (1996, p. 88) presents as introductions contain an explicit reference to previous discourse using forms like respond, Sharon Thompson’s letter, the reply to Larry I promised, and a storm of protest.

Message turns in the email condition can be hundreds of words long (average 149.3 per interaction), but the three-part message structure occurs even in shorter messages, as illustrated in (26).

(26) Hello! Sorry it took so long for me to respond to your letter..I haven’t been at school lately. Vacation was great..but it never seems to last long enough! I think for best female vocalist we should choose Alanis..seems like she has gotten really hot lately. I think your idea of going from easy listening to heavy is great. I don’t have my paper with me right now that has all of our choices on it so there isn’t much more I can think of..so I will close here and check in probably on wednesday.. talk to you later
[Name removed] (a)

After some message transmission management, the participant responds to some pleasantries and then begins the decision making. She produces a suggestion and agrees with her partner’s suggestion before formulating a closing and more message transmission. Therefore, the sandwich structure is still maintained, even though no formal features mark the structural boundaries. In the synchronous conditions, it was observed that few turns combine routine and nonroutine management functions, although this behavior did emerge, especially in the longer turns. When they did co-occur, routine and
nonroutine functions did not appear to combine in predictable orders. However, in the asynchronous interactions not only does it become the norm to combine routine decision-making and nonroutine discourse management activities, but also this combination is organized into a characteristic structure. It is remarkable to observe the uniformity with which message turns, regardless of overall length, conform to the three-part structure. Furthermore, some managerial activities, such as opening and closing turns or transmission management, appear to have become routine.

In summary, as we predicted, the asynchronous computer mediated interactions incorporate more features associated with the written extreme of the oral/written continuum than the synchronous computer mediated interactions. They display a uniform turn structure and a strong preference for parallel organization of both routines and nonroutine management activities. Each asynchronous turn seems to be treated as a sequence that needs to be opened and closed, reinforcing the preferred turn structure in which management activities both begin and end the message. There is little evidence of compression, although encoding strategies that use spatial orientation minimize the need for linguistic form, and long turns minimize the number of turns needed to complete the task. Instead of compression strategies, participants employ elaborate encoding strategies for both routine and nonroutine management activities, and they also encode functions that are ordinarily left unexpressed in the synchronous interactions. Significant amounts of linguistic form are expended on activities that seem unnecessary to complete the task, such as references to internal states and exchanges of pleasantries. This explicitness has the consequence that the context is packaged with the message, which has been associated with written discourse. All of these properties of asynchronous interaction contrast starkly with the encoding strategies observed in the synchronous interactions.

Discussion

Table 1 summarizes the differences in the three modalities and the three types of turn strategies that were observed in the interactions. For each turn strategy introduced, the table lists the characteristics of turn structure associated with that strategy. In our previous studies of simpler decision-making interactions, differences between face-to-face and computer-mediated interactions did not occur in turn size or turn structure, and participants employed the same decision routine, as well as other familiar routine structures such as adjacency pairs: Only the relative frequencies of the strategies changed, with a preference for more elaborate and explicit management strategies and more compressed routines in the computer-mediated condition. This description also holds for those participants in the MTV task who adopted the short turn strategy.

When participants adopt the long turn strategy, a new parallel structure appears, which changes the decision routine as well as the turn structure of the interaction. The long turn strategy contributes to compression and turn management by reducing the number of agreeing turns needed to make a series of decisions. Consequently, adjacency is loosened: Suggestions and agreements are no longer strictly adjacent to the orientations and suggestions that they respectively continue. However, these continuations are still turn adjacent, unlike the lack of adjacency that occurs with multiple participants in chat rooms.
(Herring, 1999). The features which characterize the long turns of the synchronous computer-mediated interactions are all evident in the asynchronous email interactions. However, the uniformity of turn structure in the email condition contrasts with the long turns in the synchronous condition. Participants adopt epistolary conventions that reinforce the sandwich structure observed in the email messages.

<table>
<thead>
<tr>
<th>Face-to-Face Interaction</th>
<th>Minimal explicit management of turns, transmission and decision-making. Short synchronous turns average 8.6 words per turn per interaction. • serial decision-making • decision functions and discourse management functions encoded in separate turns • reliance on adjacency • no characteristic functional structure within the turn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synchronous Computer-Mediated Interaction</td>
<td>Increased explicit management of turns, transmission and decision-making. Short synchronous turns as low as an average 6.31 words per turn with features of face-to-face turns described above. Long synchronous turns as high as an average 97 words per turn: • parallel decision-making • decision functions, discourse management functions encoded in the same turns • loosened adjacency: turn adjacency instead of strict turn adjacency • no characteristic functional structure within the turn</td>
</tr>
<tr>
<td>Asynchronous Computer-Mediated Interaction</td>
<td>Routine explicit management of turns and transmission. Extensive explicit management of decision-making, references to mental states. Long asynchronous turns average 149.3 words per turn per interaction with features of long synchronous turns described above. • characteristic functional structure in which decision-making functions are preceded and followed by discourse management functions</td>
</tr>
</tbody>
</table>

Table 1. Characteristics of three modalities and turn strategies

Comparison of the face-to-face and synchronous computer-mediated conditions should allow us to assess the effect of machine mediation on the interaction, while comparison of the synchronous and asynchronous computer-mediated conditions demonstrates the effect of synchronicity. However, Rice (1999) warns that media researchers must take care that their results are not artifacts of factors whose effects cannot be separated from the variables under investigation. This problem is difficult to avoid when behavior as complex as human interaction is investigated, and at least three factors interact with the variables of machine mediation and synchronicity. First, in the computer-mediated
conditions, the language is encoded in writing instead of speech, so that some differences we observe are a result of the code, rather than a result of computer-mediated communication *per se*. Clear examples are orientation strategies that make use of punctuation, which are not possible in oral modalities, just as intonation and prosody are not available in written modalities.

The second factor that confounds the comparisons described here is the fact that participants in all the synchronous conditions interacted for only one or two hours, whereas participants in the email condition interacted for one or two months. Walther (1994) reports that participants’ anticipation of future interaction influenced interpersonal variables such as intimacy and composure more powerfully than the medium did. We suspect that similar factors result in the low frequencies of utterances with personal content in the synchronous conditions compared to the high frequency of interpersonal management observed in the email interactions. Consequently, the data do not support inferences that would associate this difference with the communication environments.

A final reason for caution arises because we did not exactly simulate the synchronous conditions of face-to-face conversation: Transmission in the computer-mediated conditions was only quasi-synchronous, and participants were able to take advantage of the message permanence inherent in the computer-mediated system, even though the synchronous condition was designed to minimize permanence. By allowing participants to manage their synchronous interactions using long turn strategies, the minimal asynchronicity and message permanence in the synchronous environment introduced a powerful effect on the interaction. We should note that in studies conducted several years later using the same methodology, long turns occurred only sporadically. It is likely that by the time of the subsequent studies, students had become familiar with quasi-synchronous media such as instant messaging, where short turns and compression have become the norm (Avrahami & Hudson, 2006; Baron, 2004; Ling & Baron, 2007).

If we contrast the face-to-face interactions with the synchronous computer-mediated interactions structured by the short turn strategy, the effects of machine mediation and the written code are small compared to the dramatic differences observed in the synchronous interactions that employ the long turn strategy. When participants exploit the minimal asynchronicity and message permanence in the synchronous computer-mediated condition, the features that distinguish their long turns also characterize messages in the fully asynchronous email condition. This fact provides additional evidence that the features are associated with asynchronicity, rather than machine mediation or the written code. Moreover, many behaviors not observed in the synchronous conditions emerge in the email condition, which further motivates recognizing asynchronicity and message permanence as stronger factors in the selection of discourse management strategies than either machine mediation or use of a written code. The finding that asynchronous turns are longer and incorporate linguistic complexity not observed as frequently in synchronous conditions is consistent with Sotillo’s (2000) comparison of second language learners’ interaction in synchronous and asynchronous computer-mediated environments.
The emergence of epistolary conventions and a homogenous message structure in the asynchronous email condition might simply reflect participants’ reliance on familiar strategies in the absence of established norms. However, those epistolary conventions have evolved in response to cognitive and interactional demands of letter writing that are shared by email and other asynchronous communication. In asynchronous interaction, the pressure to simultaneously decode, encode, and coordinate transmissions is absent, but the inherent delay in turn exchange creates new potential for problems in both transmission and interpretation of messages. Participants anticipate the possibility that messages which are sent might not be received due to problems with the transmission process, and the context can change significantly between turns. For example, a participant might send a message before reading the partner’s most recent message. The partner then interprets the reply in the context of the most recently produced message, although the author of the reply did not formulate it in that context. This kind of contextual mismatch creates enormous potential for miscommunication.

Many characteristics of the email messages can be viewed as strategies that manage the lack of temporal, and therefore contextual, contiguity in asynchronous interaction. For example, talk that explicitly refers to message transmission rarely occurs in the face-to-face interactions, and participants in the synchronous computer-mediated interactions are clearly frustrated by the need to spend resources on solving message transmission problems. In contrast, management of message transmission in the asynchronous interactions is not simply frequent, but entirely routine. Many of the email messages begin with an apology for not replying sooner, and most end with a reference to the next communication. Moreover, the high frequency of apologies for delayed responses reflects more than recognition of the obligations that participants accept when they engage in the communication: Delays can create serious interpretation problems that make it more difficult for participants to accomplish their goals. Similar considerations also suggest an explanation for the frequency with which Herring (1996) observed links to previous discourse at the beginning of the email messages in her corpus. When participants introduce their turns as replying to a specific person’s message, they not only perform interpersonal work, but also meet the obligations of the given-new contract (Clark & Haviland, 1977) by first identifying given information about the “most-recent-message” context in which the author is writing. Messages posted after the one identified cannot be considered part of the context for the contribution.

Other characteristics of asynchronous interaction can also be viewed as encoding features of the context and compensating for the absence of contextual contiguity. By referring directly to the ongoing communication, all explicit management strategies have the effect of encoding features of context, and they are often accompanied by additional information about the states of participants. For example, in synchronous computer-mediated interaction, transmission management leads participants to encode additional features of the context as they explain how they accidentally pressed the wrong key and express their frustration. Explicit source negotiation usually includes personal information such as I’m a little out of date with R and B lately in (16b). Similarly, the convention of dating letters encodes a temporal feature of the message context, while the forms used in salutations and closings (address terms, vocative formulae, complimentary
closes) encode and negotiate features of the interpersonal context. Therefore, the structure observed in email turns may reflect the most effective response to the systemic and ritual constraints on asynchronous communication, rather than being mail adapted to an electronic medium.

Conclusions

The interactions examined here vividly reflect the variety and versatility of encoding strategies that allow human beings to adapt their communication to the many contexts and modalities in which they interact. The interactions provide numerous examples to underscore the fact that turn management is linked to transmission management, interpersonal management, decision management, and source negotiation. What is remarkable about these strategies is that even as they become more explicit, requiring more linguistic form and more turn resources to accomplish, they are still strongly associated as they cluster together at the beginnings and ends of the email turns. Moreover, management strategies still combine these functions, especially turn, transmission, and interpersonal management activities, as in the apologies for not writing sooner that initiate many email messages. The preference to combine and conventionalize discourse management strategies is a salient feature of all three modalities.

The data also provide evidence that many features which have been associated with written discourse might be more appropriately associated with asynchronous discourse. The lack of contextual contiguity in asynchronous discourse seems to be the primary reason for the characteristic of written communication that Tannen (1982) describes as packaging relevant contextual information with the message. Unlike participants in synchronous written interaction, participants in asynchronous email interaction have both the need and the time to produce the more elaborate and explicit encodings that are associated with writing. This result supports an observation made by Baym (1996, p. 322) about CMC: “By seeing how users adapt to the constraints and opportunities of the medium, one learns more about what is often taken for granted in other channels.” Furthermore, research on CMC demonstrates how strongly design features of the medium can influence discourse management strategies.

Notes

1. The Unix talk function provides a messaging capability between two UNIX users in which the screen is split so that one participant’s messages appear above a line and the other participant’s messages appear below that line.

2. Usenet was an early system of online forums to which users could read and post contributions.

3. Internet relay chat (IRC) is one of the earliest environments for multi-user messaging with commands and capabilities focused on messaging, while MultiUser Dungeons/Dimensions/Domains incorporate descriptions and commands that evoke a virtual world and facilitate actions in that world. MUDs Object Oriented (MOOs) allow users to program modifications and additions to the virtual world.
4. Mariah refers to singer Mariah Carey and Alanis refers to singer Alanis Morissette.

5. The Presidents of the United States of America, Bush, Goo Goo Dolls, and Oasis are rock bands associated with a style known as “alternative rock.”

6. “Wh-in-situ” refers to question forms in which the question word is not moved to the front of the sentence, e.g. You were reading what? vs. What were you reading?

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