

2007

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## Recommended Citation

Anderson, J. F., Beard, F. K., & Walther, J. B. (2007). Turn-taking and the local management of conversation in a highly simultaneous computer-mediated communication system. *Language@Internet*, 7, article 7.

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# Turn-Taking and the Local Management of Conversation in a Highly Simultaneous Computer-Mediated Communication System

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## Abstract

Ongoing inquiry in communication technology research includes the questions of whether and how users adapt communication to the relatively restricted codes provided by text-based computer-mediated communication (CMC). This study proposes that adaptations may be affected by the level of simultaneity in messaging that CMC systems afford users. This suggestion is examined through an analysis of the particular conversational management strategies afforded by a fully synchronous computer-mediated communication system in which message transmission is keystroke-by-keystroke. Conversation analyses performed on the transcript of a three-person online conversation suggest several conclusions: Despite the novelty of the system, the CMC users appropriated and adapted many techniques from face-to-face conversations for the local management of conversations, including turn taking, turn allocation, and explicit interruption management. At the time, turn exchange was accomplished by the use of overlapping intermittent talk followed by lengthy strategic pauses, rather than according to the “no gap, no overlap” ideal of spoken conversation. Overall, the computer-mediated exchanges appeared resilient to modality change, and users spontaneously and creatively employed both traditional and technical features of conversation management.

## Introduction

As people continue to use computer-mediated systems to perform communication tasks previously performed in less mediated settings, questions concerning the management of such “conversations” arise. Hobbs (1980, p. 65) posed a question 30 years ago that is still prescient today: “When we move from face-to-face conversations to dialogs over computer terminals, the communication is purely verbal. The work done nonverbally now has to be realized verbally. How are realizations of (communicative) functions altered over the change of channels?”

While prior research suggests that individuals adapt to the medium of communication in use, questions remain regarding how the distortion of time, the lack of visual and auditory cues, and other characteristics of interactive messaging channels affect the local management of conversation. The problem that concerns us specifically is how participants adapt to a system’s features when taking turns. Is turn-taking systematically

different in computer-mediated communication (CMC), or do participants adapt the methods and techniques of face-to-face (FTF) conversation? How is interactional coherence between turns maintained in an environment devoid of nonverbal cues? This article addresses these questions by reporting the findings from a study of turn-taking in one type of computer-mediated conversation, in which users can see each other's keystrokes as they are entered in real time.

We first describe the work of researchers interested in how people adapt to CMC systems, with an emphasis on conversational turn-taking and related aspects of conversation management. We then present the general characteristics of interactive messaging systems and describe the type of system and data gathering method used in this study. The discussion then turns to an analysis of how study participants managed turn-taking and overlap, and the likely effects of the computer-mediated channel on that management. The article concludes with a summary of these interactional management mechanisms, comparing them with comparable mechanisms in FTF conversation.

### **CMC, Turn-Taking, and Conversation Management**

Early researchers interested in how people adapt to CMC systems focused their attention on the characteristics of media used for organizational communication. For example, Daft and Lengel (1984, 1986; Daft, Lengel, & Trevino, 1987; Trevino, Daft, & Lengel, 1990) arrayed conversations via various media along a continuum of "information richness," where rich media support simultaneous feedback, a large number of cues and channels utilized, immediate feedback, and personalization and language variety. In this view CMC was often considered a "lean" channel since, in the case of email, simultaneous feedback is typically missing and nonverbal cues are absent. However, while early studies found that subjects rated these media fairly consistently with the media richness perspective, other researchers found that experienced CMC users rated computer-mediated interaction much higher on the richness continuum (Foulger, 1990; Hiltz & Turoff, 1978; Rice & Case, 1983). This suggests that perceptions of media richness are not determined strictly by the technical properties of the medium. Foulger's finding also contributed to the growing evidence that people adapt or adapt to the characteristics of interactive messaging systems to achieve communicative ends (see also Walther & Bazarova, 2008).

Other theorists have focused on the lack of nonverbal cues in CMC as a cause of more task-oriented, hostile, self-absorbed, or impersonal communication compared to FTF encounters (although the inherent nature of these effects in CMC has been challenged by theoretical work and empirical studies; see, for summaries, Rice, 1984; Steinfield, 1986; Walther, 1992). These positions include social presence theory (Short, Williams, & Christie, 1976) and the lack of social context cues hypothesis (Kiesler, Siegel, & McGuire, 1984; Siegel, Dubrovsky, Kiesler, & McGuire, 1986; Sproull & Kiesler, 1986). Culnan and Markus (1987) refer to these latter positions as the "cues-filtered-out perspectives," because of their focus on the intrapersonal and interpersonal effects of reduced channel systems. In this area, also, there is evidence that with time and/or experience, people develop or adapt CMC cues to accommodate communicative

functions, such as socioemotional expression, that might otherwise be accomplished through nonverbal or other feedback cues (Kerr & Hiltz, 1982; Rice & Love, 1987).

More recently, researchers have sought to explain how the lack of nonverbal cues and other properties of CMC systems affect turn-taking, which presumably contributes to reduced levels of interactional coherence (Cherny, 1999) and less effective management of the conversational process (Garcia & Jacobs, 1999; McKinlay et al., 1993). Herring (1999) identified two obstacles to orderly turn-taking that are influenced differentially by the characteristics of different CMC systems—the lack of simultaneous feedback and the disruption of turn adjacencies. The lack of feedback is a consequence of the absence of nonverbal cues in all text-based CMC systems and the absence of message overlap in one-way message transmission systems such as email (the differences between one-way and two-way systems are described in the section that follows). In FTF interaction, simultaneous feedback “plays an important role in signaling listenership, timing turn-taking effectively, and maintaining continuous interaction” (Herring, 1999, p. 2).

Disrupted turn adjacencies occur often in both one-way and two-way CMC systems. In FTF interaction, relevant responses tend to occur temporally adjacent to initiating turns (Herring, 1999). However, such adjacencies in CMC can be disrupted when messages are transmitted in the order received by the system. In some extreme cases, multi-participant CMC systems may actually display responses to questions (one type of conversational adjacency pair) before the questions themselves. Cherny (1999) notes that the same phenomenon can produce “multi-threading” (multiple simultaneous topics) in Multi-User Dimensions (MUD) conversations.

Several studies have found that CMC users attempt to replicate the turn-taking protocols of FTF interaction, but also adapt them to match the characteristics of different CMC systems. McKinlay et al.’s (1993) study of groups using a computer-supported cooperative work (CSCW) system revealed an initial period in which subjects found it difficult to coordinate their discussion, followed by an emergent “free-for-all” condition, characterized by the simultaneous sending of messages and a form of “delayed action” turn-taking. Condon and Čech (2001) similarly concluded that CMC participants not only adapt to CMC environments but also look for means to exploit the characteristics of different systems to accomplish communication tasks, including turn-taking, more efficiently. Woodburn et al. (1991) suggested that participants likely adapt to the characteristics of CMC systems in various ways because the use of FTF techniques in CMC may actually inhibit effective interaction. Garcia and Jacobs (1999) also concluded that the use of FTF turn-management techniques produced problems for the users of a “quasi-synchronous” CMC system, but mainly because such systems do not allow participants to monitor the “utterances-in-production” of other participants.

### **Characteristics of Computer-Mediated Communication Systems**

At the most basic level, any data (or message) sent via one computer to another must go through processes within each computer’s central processing unit. This process changes the typed keyboard characters into electronic impulses, then into machine language that

the computer can “understand.” Users can then execute commands and finally send data to appropriate areas or receivers.

Synchronous processing, or what some authors call “real-time processing” (Capron, 1990, p. 12), is an important feature in electronic messaging systems. The concept of “synchronicity” relates to interactive conversations. Systems that feature microsecond processing and the sequential ordering of messages as received create the impression of interactive conversation for participants. Thus, in synchronous modes of interaction, participants share a common simultaneous, non-threaded message environment. The participants must be logged in to the space at the same time in order to send and receive messages. These features of synchronous messaging systems render them distinct from asynchronous email and bulletin board systems (BBSs), which may be accessed using different clients and do not require that users be logged on simultaneously.

Another way of viewing message processing is in terms of how it relates to the technique of signal transmission. The data transmission can be “one-way” or “two-way” (Cherny, 1995; cf. Capron, 1990; Walther, 1996b). One-way transmissions are sent one message at a time. One-way transmission characterizes electronic mail messages that are created by the sender, and then sent via the network (e.g., Internet or Intranet) to the receiver who then reads the message. Group chat systems such as Internet Relay Chat and Instant Messenger are also typically one-way, in that communication is transmitted one message at a time. Garcia and Jacobs (1999) refer to such systems as “quasi-synchronous,” in that they preclude simultaneous feedback because the receiver cannot read the message at the same time the sender creates it.

Holmes (1987) further observes that as additional participants join conversations within one-way systems (i.e., sequential conferencing systems), the order of the messages becomes more complex. Several different participants’ messages are sequentially ordered, making it difficult to assess who is conversing with whom without some type of cue (see also Herring, 1999).

Two-way transmissions, in contrast, are sent as a continuous stream (Capron, 1990). Two-way transmission occurs when a message created by a sender is transmitted to a receiver simultaneous with its production. (There is a delay as measured in milliseconds, due to system signal transformations of digital to analog and back to digital, but this is difficult to detect with the human senses.) The telephone is a device that sends spoken two-way transmissions. In the VAX Phone system used in this study, each participant sees his or her own message space (three lines) and every other participant’s message space on the screen. As any participant types in a character, the character appears on every participant’s screen. If a participant deletes a character, then the character is also deleted from each participant’s screen. In other words, participants can see characters as they are entered.

In summary, one-way transmission is similar to letter writing without the receiver aware of the sender creating the message, and two-way transmission is similar to the receiver reading a letter by looking over the shoulder of the sender as he or she creates it. This

study aims to understand how the two-way mode of message transmission affects the management of conversation, in contrast to other systems and environments that are not as highly interactive (email, BBSs, IRC, MUDs, etc.). This characteristic of some CMC systems illuminates a problem in the classification of all forms of CMC as “lean” media: In addition to variations along other dimensions of media richness criteria, the capability for the immediacy of feedback varies from CMC system to system. That is, feedback in an email system is typically (although not necessarily) delayed, whereas chat systems typically offer much quicker responses. At the extreme end of quickness are chat utilities that support two-way messaging. Although it is antiquated by contemporary standards, the VAX system Phone Utility, which was used in the present research, is (and was at the time our data were collected) nearly unique in its support of two-way messaging; most text-based CMC systems use one-way messaging.

Differences in the degree of synchronicity provided by different CMC systems lead us to posit three levels of simultaneity that should have implications for how online conversations are managed. Systems can be said to predispose communication to *non-simultaneity* (i.e., asynchronous, one-way systems, such as email, discussion boards, blogs), in which conversation is isolated spatially, chronologically, and contextually; *near simultaneity* (i.e., synchronous, one-way systems, as in instant messaging, multiparticipant chat rooms, and text chat in multiplayer games), in which users typically respond to others’ comments as soon as they are received; and *high simultaneity* (i.e., synchronous, two-way systems, such as the VAX “phone” and the contemporaneous UNIX “talk” programs), in which not only immediate responses are possible, but also communications overlap.

The system used for this study was the System Phone Utility running on the VAX computer of a large Midwestern university in the United States. The system was a highly simultaneous, synchronous two-way communication system, in which participants in conversations could read and write messages concomitantly with each and every other member. Students in many computer classes at the university learned about the Phone Utility feature as a mode of CMC. Two of the authors had taught independent technology and communication courses and used the Phone Utility as a group interaction tool. Although the basic functionality of Vax Phone has been subsumed more recently by systems such as AOL Instant Messenger (AIM) and other popular chat systems, with the exceptions of ICQ in the late 1990s (Herring, 2002) and Google Wave in the late 2000s, the client/server chat systems that followed the VAX Phone, for the most part, have not replicated its character-by-character appearance (and disappearance due to deletion) of messages. This feature made for an extremely dynamic environment, one in which the moment-by-moment behaviors to establish and maintain coherence were visible to all participants, making it an ideal setting in which to explore how aspects of conversation management, such as turn-taking, are affected by the technological affordances of CMC systems.

Each participant in the study was in spatial isolation from other participants and was equipped with a computer, keyboard and monitor. In the data reported here, only the first initial of each participant is shown to disguise the identity of the participants (a typical

screen display can be seen in Appendix B). However, in the actual interaction, first initials plus last names were visible on-screen, identifying each participant. The monitor displayed four dashed lines across the screen, which divided it into five sections. The upper two sections identified the system, group number, date, and meeting time. The third, fourth, and fifth sections displayed each participant's identification and allowed three lines of text to be displayed at any one time for each participant. Participants could edit their own utterances (delete or add characters, words, or sentences) by using the backspace key, the space bar, and by using the insert mode and typing over the characters. Each time a participant pressed the "enter" key, only the text in his or her subsection would scroll upward (e.g., if three lines of text were entered and the "enter" key pressed, then the top line would scroll out of view for all participants and the bottom two lines would move up).

### **Participants and Data**

The participants for the present study were three undergraduate students assigned to a group problem-solving task. This group was one of 15 groups involved in a larger study. The students were familiar with the VAX system, but reported that they had had no previous experience with the Phone Utility. Each group had one participant from three different departmental majors assigned to it: one from psychology, one from business, and one from communication. This was done in an effort to avoid participants knowing each other. The participants were assigned to groups according to available time schedules to undertake the problem-solving task. Without access to video screen capture applications such as TechSmith Corporation's Camtasia, data collection at the time these interactions were recorded (in 1992) consisted of videotaping the computer-mediated conversation with a camcorder, positioned to record the interaction as it was displayed on a fourth online terminal. The videotape captured the interaction as a participant would be viewing it sitting at his or her computer screen.

The data collection method allowed detection of which interactants were typing utterances (whether simultaneously or not); who stopped while others continued; where, precisely, overlaps took place; how long it took each participant to type an utterance, and where pauses occurred within each utterance. Thus, the data collection method made it possible to identify and describe the mechanisms and practices of local management of the interaction.

The conversation examined in this article was chosen for the videotape's clarity and vividness of picture quality, which made possible a precise and detailed transcription of the ongoing interaction. This was a double-blind study, in that the researchers who performed the analysis were not involved in any of the data collection. Participants were given only a topic with directions to engage in a group discussion. Specifically, they were told to develop ideas for hiring faculty for the university for the 1990s. They were directed to develop possible solutions and reach a consensus through the use of the interactive computer system. There was no particular script or procedure they were required to follow (see Appendix A for the instruction sheet distributed to the participants).

The data were transcribed using a multi-staged process of viewing, transcribing, editing, and proofing. First, one of the authors viewed the videotaped conversation while another transcribed. Next, those transcriptions were typed and notations were developed based on Gail Jefferson's notation system as described in Atkinson and Heritage (1984). After applying the notation system, the videotaped conversation was viewed several more times and the transcript edited until the first two authors were confident that all participants' entries were identical, all pauses timed appropriately, and all notations were appropriately applied.<sup>1</sup> We then proceeded to analyze how this particular conversation was managed by the participants involved, drawing primarily on Sacks, Schegloff, and Jefferson's (1974) model of conversational turn taking.

## **Findings**

### ***Turns and Turn Allocation***

Sacks, Schegloff, and Jefferson's (1974) model of turn taking focuses on two components: the "turn-constructive component" based on the speaker's choice of turn taking unit-types, and the "turn-allocation component" based on how a participant takes the next turn (p. 12). Sacks et al. note that turns in talk can be constructed out of four units of talk: (a) one word, (b) a phrase, (c) a clause, or (d) a sentence. The data analyzed for this study reveal that most of the turns were constructed of complete sentences (the complete transcript is presented at the end of the article). Exceptions were incomplete utterances resulting from interruptions and backchanneling.<sup>2</sup> One explanation for this finding may be that text features of written discourse guided the participants' computer-mediated interaction, where grammatically complete sentences are the prescriptive norm.

The Sacks et al. (1974) model identifies three techniques for turn allocation: (a) current speaker selects next, (b) another speaker self-selects, and (c) current speaker continues. A transitional relevance place (TRP) refers to places within talk in which participants can project where a turn might end. TRPs cue participants to a turn's end; in FTF interaction, such cues may include sentence structure, phrases, a word, silence, pitch or volume change, and body motion. TRPs can be found in sentences where a syntactically and grammatically correct phrase is complete, but its creator is adding other phrases. Sometimes just one word can be considered as ending with a TRP (e.g., Yes.).

Schegloff and Sacks (1973) identified the "adjacency pair" as a concept for understanding paired actions. The first action, "the first pair part" (e.g., a question) is ideally always followed by a "second pair part" (e.g., an answer). One speaker provides the first pair part, and the second pair part is typically provided by a second speaker.

The data analyzed in this study contained 83 turns at talk and 79 lines refreshed (blank lines created when a participant pressed the "enter" key without typing any comment), for a total of 162 activities (Appendix D, Table 4). Twenty-four instances of current speaker selects next speaker were found in the data (Appendix D, Table 1); of these, 20 were instances of a first pair part to an adjacency pair that offered one or both of the other participants an opportunity to respond with the second pair part. There were 42 instances



of a present speaker self-selecting (Appendix D, Table 2), and 17 instances of present speaker continuation (Appendix D, Table 3), making self-selection the preferred means of turn selection. A ‘contiguous utterance’ (noted by the symbol =) is the continuation of a previous utterance by the same participant with no intervening pause (see Appendix C for all notation symbols). Techniques of self-selection and current speaker selects next speaker are illustrated in Example 1. The symbols \*< >, an asterisk and left/right angle brackets, are notations for a participant *refreshing* one line (one asterisk), and the length of pause is given in seconds in the angle brackets. Instances of overlap are indicated by a double underline for participants’ comments that were typed after another participant had begun commenting.

(1)  
 01 B: Does anyone feel they know where ~~were~~ we are headed with this?  
 02 A: \*<0> Well, if we decide that one category is more important than the others,  
 03 B: \*<0> did that help? \*<95>  
 04 A: =we are basically saying that the University should hire people who excell in that=  
 05 =one category.

In line 01 speaker B self-selects, offering an adjacency first pair part to select both other participants. Overlap occur in lines 02 (as speaker A accepts the turn at the TRP) and 03 (because speaker B adds a tag question—“did that help?”—at the same time). Such overlap can only take place in a two-way system, since in a one-way system the messages would be displayed in their entirety and sequentially on the screen in the order in which they were received by the system. Speaker B then refreshes one line and pauses for 95 seconds, which gives the two other participants ample opportunity to respond with second pair parts.

Examples of current speaker continuation are shown in Examples 2, 3, and 4 below.

(2)  
 23 C: a stop: ....(4)we need to store some of this info.....(23.7)  
 24 do we know how?

(3)  
 69 A: \*<0>Then all we have to do now is set guidelines for hiring those people. (5.5)  
 right? \*\*<100>

(4)  
 76 C: =bring in new ~~ideal~~ ideas...  
 77 A: Good point., (9.5) but geography isn't the most important thing to consider,  
 78 although it ~~does~~ is important to have ~~new~~ ideas. \*<9>  
 79 (18.4)  
 80 A: In each college, there are intro classes. I think that instructors for those classes

One instance of current speaker selects next was identified at line 48 in the conversation as A selects C as the next speaker, shown below in Example 5.

(5)

48 A: \*&lt;0&gt; C - What kind of qualities should these people have?

However, it appears that turn taking in the conversation was primarily accomplished through self-selection by participants. Self-selection took place when a participant took a turn without receiving any cue from another participant such as addressing by name or requesting a response.

There were four instances in which participants used current speaker selects next and no other participant offered a second pair part. In Example 6, participant A asks C a question but C never responds to it. This could be due in part to the fact that A quickly presented another question with a more specific topical focus.

(6)

48 A: \*&lt;0&gt;C - What kind of qualities should these people have?

49 C: =who come from different areas to give some type of color.

50 (15.6) Not just educational (5.3), get some head on experience in the real world.

51 A: So do

52 you think it is important to have a diverse faculty, or a faculty who are all experts

53 in one area?

### **Overlap**

Conversation analysts have found that turn exchanges in spoken discourse tend to be precisely timed, according to the principle of “no gap, no overlap.” That is, conversationalists follow a normative ideal whereby they do not allow large gaps (3 seconds or more, McLaughlin, 1984), nor do they overlap with others’ talk.

Schegloff and Sacks (1973, p. 296) termed this phenomenon “sequential implicativeness,” while Nofsinger (1991) refers to it as “occasioning” (p. 69). These authors note that the essence of conversation is the evolution of turn taking. As evidence of this, Levinson (1983) observes how well the turn taking system works, because overlapping conversation occurs so infrequently in FTF conversation.

First there are the surprising facts that less (and often considerably less) than 5 per cent [sic] of the speech stream is delivered in overlap (two speakers speaking simultaneously), yet gaps between one person speaking and another starting are frequently measurable in just a few micro-seconds and they average amounts measured in a few tenths of a second ... (Levinson, 1983, pp. 296-297)

In contrast, simultaneous talk occurred often (30% of the turns) in the data analyzed here, and “gaps” were frequent as well. There were 25 overlaps ranging from one to 10 words in duration, and 37 pauses averaging about 12 seconds per pause. In FTF conversations, one cause of overlap is when a speaker self-selects prematurely; such overlapping generally occurs “within a syllable or two of a TRP” (Nofsinger, 1991, p. 102). Examples of overlapping due to premature speaker self-selection are shown in Examples 7, 8 and 9 (double underlining indicates overlapping comments).

(7)

50 C: (15.6) Not just educational (5.3), get some head on experience in the real world.

51 A: So do52 you think it is important to have a diverse faculty, or a faculty who are all experts  
53 in one area?54 B: \* $\langle 162 \rangle$ 

55 (14.6)

(8)

58 A: \* $\langle 0 \rangle$ One of the negative side effects of having a faculty who are all specialists in one  
59 area is that the students need information about everything

60 in their chosen field, not just one area.

61 B: You wouldn't want to hire specialists in one area or the base to work from would

62 be narrow. You do want to consider?

63 A: \* $\langle 0 \rangle$  So do we all agree that we should hire a faculty whose=64 C: \*\* $\langle 10 \rangle$  I (41)=

65 A: =members all excel in different areas of expertise?

66 B: \* $\langle 0 \rangle$  Yes; ~~heress~~ here. \* $\langle 10 \rangle$ s\* $\langle 46 \rangle$ 67 C: =agree

68 (18.4)

Overlap occurs in lines 50 and 51 when speaker A self-selects near what may be projected to be a TRP at the end of speaker C's syntactically complete utterance. The participants then paused for 14.6 seconds as noted in line 55, which gave them an opportunity to decode each others' utterances. Similarly, speaker B self-selects on line 61, perhaps assuming that A's utterance in 59 was complete. Nofsinger (1991) notes that one frequent cause of overlap in FTF conversation occurs when more than one listener self-selects at the same time. For example, in Example 9, speakers A and C simultaneously accept B's offered adjacency first pair part and self-select as next speaker. They continue typing simultaneously until line 18, at which point all three participants pause to decode each others' messages.

(9)

12 B: can you state a (3.5) sample policy to brainstorm (4.) from \*\*\* $\langle 50 \rangle$ 

13 (10.5)

14 A: Well, I think that, in simple terms, the university should hire a faculty of=

15 C: Lete Lets start with the busie business=

16 A: =diverse experience to better compensate for the whole variety of class available.

17 C: =dept.

18 (4.8)

Notice in Example 9 that rather than A or C dropping out to yield the floor, as is common in FTF conversation when an overlap like this occurs, both continue to complete their turns, resulting in an extended overlap.

The third reason overlapping occurs, according to Nofsinger (1991), is when a listener self-selects at the same time "that the current speaker elects to continue" (p. 102). This is illustrated in Example 10, in which speaker A self-selects at the same time speaker B

elects to continue, resulting in overlap. Speaker B refreshes one line, keeping the message displayed, and pauses for 95 seconds before presenting another utterance. Thus the participants are just beginning discussion on a system new to them when they encounter the first instance of overlap.

(10)

01 B: Does anyone feel they know where ~~were~~ we are headed with this?  
 02 A: \*~~<0>~~ Well, if we decide that one category is more important than the others,=  
 03 B: \*~~<0>~~ did that help? \*~~<95>~~

These examples suggest that, although overlapping occurs more often in two-way computer-mediated conversations, the causes are often the same as those that cause overlap in FTF conversations. At the same time, much of the conversational overlap evident in the data cannot be attributed entirely to difficulties in timing turn alternation. Examples 11 and 12 below illustrate how simultaneous talk persists across multiple turns and utterances.

(11)

19 B: are you saying diverse experiences in different work situations=  
 20 C: \*\*\*~~<20>~~  
 21 A: No, diverse experience as far as the three categories we are analyzing.\*~~<4>~~  
 22 B: =among professors in the same field of expertise, or diverse lengths of time=  
 23 C: a stop: ....(4)we need to store some of this info.....(23.7)  
 24 do we know how?  
 25 B: =the workplace\*~~<3>~~\*~~<9>~~ That sounds like a good long-term goal- to me. ~~ss~~\*~~<3>~~

(12)

31 A: \*~~<0>~~What do you mean by similar experiences?  
 32 B: =unless thevssssss th \*~~<3.2>~~ I mean the that if we try to hire  
 33 ~~diverse~~ (17.1) people with diverse backgrounds and put them on the same staff  
 34 there is bound to be frictions, or as the handout a states, fragmentation.  
 35 A: \*~~<0>~~ Our first concern is for the students.  
 36 not the staff.  
 37 C: That is ~~wat~~ what makes college so important  
 38 B: \*~~<0>~~ If we-re concerned for the student then we want to build

In Example 11 above, lines 19 through 23 show overlap occurring first between speakers A and B, then among all three speakers. All three complete their turns. In Example 12, lines 31 and 32 show overlap between A and B again. While it is apparent in both data segments that the participants are accomplishing intersubjective understanding with their interaction (i.e., they are responding to each others' topical focus), it is equally clear that participants do not orient to the normative rules of turn taking as typically found in FTF conversation. In FTF conversation, as Nofsinger (1991, p. 87) notes, "only one participant usually speaks at a time, and overlap, when it occurs, is brief."

How is talk managed, given this preponderance of overlap? Lerner (1989) suggests that conversants deal with the problem of overlap by "delayed completion" (p. 167). The conversant takes a turn, utters the first portion of a complete utterance, but waits until

other participants are prepared before completing the final portion. Lerner found that in FTF conversations, speakers who provided delayed completions had “produced enough of an utterance prior to the overlap to be able to produce an utterance which will be recognizable as a completion of that prior utterance” (p. 170). Lerner notes that “[s]peakers employ resources intrinsic to the turn-taking system, such as the projectability of turn unit completion, to regain turn occupancy and to locate the utterance of the out-of-turn speaker as having been interruptive” (p. 167).

In this corpus of data, delayed completion is found in every incident of overlapping talk in which a partial utterance was made (see Notations, Appendix C). The capability of participants to attach a delayed completion to partial prior utterances created the effect of complete contiguous utterances. Example 1 shows speaker A providing a delayed completion. Participants B and C’s saw A’s lines 2, 4, and 5 together in A’s box on the computer screen. Thus, overlap does not appear to be a hindrance to the management of turn taking in two-way computer-mediated conversation, due to the phenomenon of contiguous delayed completion. The computer screen display enables this by displaying each participant’s messages separately, so that others’ responses do not intervene.

The Phone Utility facilitates turn management when overlap occurs by displaying prior messages. Nofsinger (1991, p. 80) observes that “[s]ingle sequential turns are important in conversation because human beings’ capacity to monitor several different spoken messages at once is limited.” However, because in CMC participants’ utterances can remain on the screen, participants are capable of monitoring the others’ utterances and contributing their own, all at the same time (Herring, 1999). In other words, unlike in FTF conversations, participants are able to talk and listen (type and read) more-or-less simultaneously.

In addition, lengthy pauses gave ample time for participants to decode overlapping messages, as in Example 1.<sup>3</sup> Like in FTF, participants must pause to decode messages; the difference in computer-mediated conversation is when they choose to decode. In FTF conversation, decoding is more locally constrained, since the on-going talk is ephemeral. Participants cannot go back and review what previous speakers really said, hence pausing is brief and frequent. In the Phone Utility conversation, in contrast, a three-line record is displayed which can be reviewed until the encoder scrolls it up and out of view. Pauses are less frequent, but of considerably longer duration.

Another possible explanation for the extensive occurrence of overlap in the data is the lack of FTF signals that normally help to regulate the timing of turn taking, such as gaze, pitch, voice volume, and body motion. Levinson (1983) has criticized the view of psychologists working on conversation who emphasize that turn taking is “regulated primarily by signals, and not by opportunity assignment rules at all” (p. 302). He notes that

[t]he problem here is that if such signals formed the basis of our turn-taking ability, there would be a clear prediction that in the absence of visual cues there

should either be much more gap and overlap or that the absence would require compensation by special audible cues. (p. 302)

Levinson (1983) cites conversation analytic research into telephone conversations, in which findings showed *less* gap and shorter overlap than in FTF conversation, as evidence for a discounted role of signaled cues in turn taking. However, exactly the opposite was found in the present research: Gap and overlap are evident in all the examples shown above and throughout the corpus of data. Thus, one possible interpretation is that the present research provides evidence for the importance of nonverbal signaling cues in turn taking.

If nonverbal turn-taking cues are important yet lacking, how were the participants in the present study able to interact, carry on a conversation, and complete the task at hand? Other resources were available to them that deserve further consideration: refreshed lines (79 instances) and pauses (37 instances).

### *Pauses*

For McLaughlin (1984), a pause “over 3 seconds or more” represents a “lapse” or interaction failure, with a few exceptions. The exceptions are “(1) silence following an interrogative or imperative TCU [turn construction unit]; (2) silence subsequent to turn-holding cues such as grammatical incompleteness, sustaining intonation contours, or filled pauses; (3) silence that co-occurs with activity by one or both of the parties, such as lighting a cigarette or searching for one’s wallet; (4) ‘silence representing discretion in the presence of a third party’” (p. 115). The average length of pauses in this corpus of data would qualify them as lapses, according to McLaughlin. Or would they?

Some of the pauses can be explained in terms of McLaughlin's exceptions. For example, all of the instances for current speaker selects next speaker can be included under the first exception (Appendix D, Table 1). All but one (line 47, although no second pair part was given for that question) of the 24 turns had pauses following them. Regarding the second exception, a refreshed line could plausibly substitute as a cue for holding the floor, similar to sustained eye contact. By the last third of the data set, all three participants were refreshing three lines and subsequently adding comments. It is impossible to know what other activities each participant was involved in at his or her desk, thus the third exception may or may not apply. Similarly for the final exception, this was a group of three, not a dyad as McLaughlin assumes. The experience was unique for each participant, and accordingly, each may have perceived it to be an unusual conversation with unusual turntaking rules.

At the same time, the use of pauses is striking and widespread, suggesting the need for a more general explanation. The participants appear to be engaging in intermittent talk followed by strategic pauses throughout the data corpus. Pausing provides opportunities for the participants to decode and encode utterances cognitively, as well as to initiate and respond to talk. Thus frequent, lengthy pausing both compensates for and enables extensive overlap in the two-way computer-mediated environment.

In summary, while it is apparent that overlap occurs in computer-mediated conversation for some of the same reasons that it does in FTF conversations, it is also apparent that the medium facilitates overlap to a greater degree than does FTF conversation. Even novice users adapt quickly to the medium in how they deal with overlap: They simply leave the utterances visible until the other participants pause to read them. They know they have left their utterances on-screen long enough when other participants produce new utterances whose content shows that the previous utterances were received and understood. Thus coherence in the on-going interaction signals that older utterances can be removed.

### *Interruption*

Nofsinger (1991) distinguishes between the concepts of overlap and interruption, defining interruption as “simultaneous talk that does not occur at or near a TRP. It involves the apparent violation of turn-taking norms, in contrast to simultaneous talk that results from participants’ orientation to those norms (overlap)” (p. 102). Any overlapping utterance that did not occur at or near a TRP was identified as an interruption. Overlap is simultaneous talk, such as speakers self-selecting at the same time, that would not constitute an intentional interruption. Only two interruptions thus defined are apparent in the present corpus; these are shown (in boldface) in Examples 13 and 14.

(13)

21 A: No, diverse experience as far as the three categories we are analyzing.\*<4>  
 22 B: =among professors in the same field of expertise, or diverse lengths of time=  
 23 C: a stop: :::(4)we need to store some of this info.....(23.7)

(14)

121 A: =strong ties to state business, and the continued emphasis on quality education.  
 122 B: \*\*\*<0>C - DO YOU THINK that we have enough with A’s suggestion to give  
 positives,  
 123 negatives=  
 124 A: \*\*\*<2> **I think we have enough, I just wanted to make sure that both of you do too.**  
 125 B: =and justify our position.\*<100>  
 126 C: =\*\*\*<0>I think ~~the~~ ~~the~~ that ~~we~~ we do we stated that the people we hire should be diverse=  
 127 and ~~the~~ that will inable students to get a better understanding of the out side ~~we~~ world

In Example 13, C interrupts A by adamantly exhorting A to stop sending utterances. In Example 14, the interruption has no clear purpose: speaker B addresses speaker C and asks a question, but A interrupts and attempts to provide the answer to B’s question. This is evident when A refreshes 3 lines, waits 2 seconds, then provides a comment. However, while these examples, as well as many of the examples of overlap shown earlier, could be described as interruptions according to Nofsinger’s definition, they are not oriented to as interruptions by the other participants. There are two apparent reasons for this. First, although they represent forceful incursions into another participant’s utterance, they do not prevent the other from finishing. Participants in this conversation did not stop talking when someone else began to speak out of turn. Second, although the interruptions can be viewed as violations of turn-taking etiquette, conversants did not orient to them as ill-

intentioned or rude. Again, it was not necessary for the participants to consider the overlaps as interruptions, since they were not prevented from finishing their own utterances, and the overlapping utterances were still available to all speakers when they ended their own transmissions. Thus although in the two incidences above a participant blatantly and knowingly ignored other participants' right to that turn and attempted to prevent that other person from continuing, the computer-mediated environment rendered actual interruption impossible.

### Summary and Conclusions

This research was undertaken to explore how conversation is locally managed by participants within a highly simultaneous, synchronous, two-way CMC environment. The data show that participants utilized many methods and techniques of FTF conversation. The findings also confirm those of earlier studies showing that CMC users adapt these methods to the system in use (see Table 1 for a summary of findings). For example, while the interaction resembles the Sacks et al. (1974) turn-taking model, turn taking was systematically different from that found in FTF conversation. Participants routinely constructed message units from syntactically complete sentences, rather than from phrases or fragments. When allocating turns in the conversation, participants tended to self select rather than select a next speaker. Moreover, turn exchange was accomplished by the use of (overlapping) intermittent talk followed by lengthy strategic pauses that provided opportunities for encoding and decoding of messages, rather than according to the “no gap, no overlap” ideal of spoken conversation.

Turn-taking	Participants tended to self-select
	Turns were syntactically complete sentences
	Turn exchange accomplished by intermittent talk followed by strategic pauses
Overlap	Occurred often
	Not a problem because participants could delay the completion of an utterance
Pauses	Strategically used to decode others' messages and to allow others to decode their own
	Used as a cue to self-select a turn or to allow others to take a turn

Table 1. Summary of findings

Most strikingly, and consistent with the findings of previous research (Condon & Čech, 2001; Van der Wege & Clark, 1997), the data show a preponderance of overlapping utterances. Cherny (1999) and others (e.g., Herring, 1999; McKinlay et al., 1993) have challenged the utility of turn-taking models in describing CMC interaction. Cherny argues that notions of shared or collaborative floor (pp. 174 and 196) seem to be more helpful than the standard turn-taking model. McKinlay et al.'s findings show a similar apparent free-for-all of turn-taking as was found in this research. On the one hand, this is what we might expect given that nonverbal turn-taking cues are unavailable in text-based CMC. In computer-mediated conversation, the participants must rely mainly on the utterance content and textual cues. As earlier researchers have suggested, this information can disrupt turn adjacencies (Herring, 1999) and be insufficient to enable participants to



time turn taking precisely. On the other hand, two-way systems allow for the recognition of refreshes and pauses, which also affect interaction management. Thus, even though overlap occurred in the present study, it was not a problem due to the possibility of delayed completion enabled by the three lines of potential displayed utterances for all three participants within the Phone system.

Indeed, rather than being a hindrance, the highly simultaneous mode of message transmission in this CMC system appears to have enhanced the management of overlap in the conversation. The participants adapted quickly to the system, typing at the same time, and using strategic pauses to decode messages from other participants and to allow sufficient time for others to read their comments. The system made it possible for participants to encode new utterances while decoding old ones, by virtue of the fact that all three participants' messages were displayed simultaneously on their monitors. The fact that overlap as interruption was limited to only two occurrences is further evidence that the participants had adapted successfully to the new methods of turn allocation within the CMC system. One explanation for this finding is that the VAX Phone system allowed participants to monitor each other's "utterances-in-progress," unlike the QS(quasi-synchronous)-CMC system studied by Garcia and Jacobs (1999). They attributed difficulties QS-CMC users had interpreting the relation between utterances and, consequently, their meaning and interactional status, to the lack of this feature. Thus, even though two-way, character-by-character transmission systems have never been popular, the present findings suggest that they remain conceptually important (Herring, 2005). In the present study, rather than being dysfunctional, overlapping exchanges progressed smoothly overall, and the participants were able to complete their assigned task. However, the students were explicitly told that they would be graded on the frequency of their participation. Thus, there was an incentive for each student to participate often; this is another factor that should be taken into consideration in accounting for the high frequency of overlap in the sample.

Sacks et al. (1974) describe the organization of conversation as a means for interaction to perpetuate itself. That is, participants are motivated to listen and prepare to take turns, be aware of what is being discussed in order to determine what is happening to whom, and be able to reply to previous talk which exhibits that they understand what was said. Computer-mediated conversation also appears to be a self-perpetuating interactional system in this sense. Furthermore, two-way CMC may even be an improvement over FTF for the local management of conversation for certain purposes, for example in group problem solving. The goal of problem solving within groups is to develop better solutions; this is achieved through the group members' participative efforts—each member adds contributing information and opinions while helping to organize and summarize the contributions of others into useful resources. Ideally this should be a reciprocal endeavor, with each member sharing and responding in an effort to come to some kind of consensus or unanimity. Two-way computer-mediated conversation could play a useful role in meetings and conferences, especially when members have ideas and comments that they wish to express in the heat-of-the-moment. Overlap would not be a problem in such a setting, and nobody could be interrupted. In fact, "interruptions" could

function as a simple summons reminding participants to avoid trivial pursuits and to focus on impending issues.

The information richness model (Daft, Lengel, & Trevino, 1987) and the lack of social contact cues hypothesis (Sproull & Kiesler, 1986) are two arguments that researchers (e.g., Benbasat & Lim, 1993; Hollingshead, McGrath, & O'Connor, 1993; Valacich, Dennis, & Nunamaker, 1992) tend to use when reporting how technology affects the communication process and outcomes because of the lack of nonverbal cues. As Walther (1996a) and Walther, Anderson, and Park (1994) have argued, however, the findings using these models may be biased. This is due to the fact that the findings compare CMC to FTF, using zero history groups, using participants new to the system, and without considering how participants might adapt to the system and their conversation partners over time. The results of the present study suggest that participants can and will learn to use substitution mechanisms either in textual form or in the form of other interactional cues (e.g., refresh lines, pauses) in place of nonverbal cues that are missing from CMC. At the same time, CMC may provide new opportunities for interaction that are not available in FTF. For this reason, it is questionable whether we can compare computer-mediated conversation in absolute terms to FTF interactions.

Condon and Čech (2001) compared dyads using FTF, email, and synchronous CMC systems and found that the same decision task was completed in about half the number of words in the synchronous CMC systems. McDaniel, Olson, and Magee (1996) compared FTF and CMC conversations among small groups of scientists and found that the technology encouraged more people to participate. This study's findings similarly imply that synchronous, two-way computer-mediated conversation can enhance the decision-making process of geographically dispersed groups as compared with one-way CMC systems or (two-way) FTF conversation. This should be especially true for individuals who might be reticent in FTF encounters, when exact transcripts are needed immediately, or for the purpose of getting all members' ideas expressed.

### **Acknowledgment**

We wish to thank Sandy Ragan for the multiple reviews and suggestions which aided in the development of this manuscript.

### **Notes**

1. Transcribing the data was somewhat of a challenge. Each of the three participants' message areas (three small windows on the screen; see Appendix B) was scrolling independently; thus, we had to keep track of three independently-timed utterances. This necessitated continuously rewinding, reviewing, and timing of each, as well as making notes.
2. McLaughlin (1984) argues that backchannels—utterances that do not count as words or those that are irrelevant to a conversation—should be considered as turns because they serve an interactive function in conversations.

3. Another factor that may contribute to the incidence of pausing is that each participant was sitting at a desk, reading other material that related to the task, and possibly making notes or drawing models on paper, while interacting with the other two at the computer.

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## Transcript

- 01 B: Does anyone feel they know where ~~wer'e~~ we are headed with this?=  
 02 A: \*<0> Well, if we decide that one category is more important than the others,=  
 03 B: =\*<0> did that help? \*<95>  
 04 A: = we are basically saying that the University should hire people who excell in that=  
 05 =one category.  
 06 (10.9)  
 07 C: The most important thing is that we agree on ~~somehink~~ something.\*<50>  
 08 (9.7)  
 09 A: \*<0>Then we need to decide ~~wh~~ which policy the University should take before  
 10 we decide which of the three categories is the most ~~imop~~ important.\*<45>  
 11 (6)  
 12 B: can you state a (3.5) sample policy to brainstorm (4.) from \*\*\*<50>  
 13 (10.5)  
 14 A: Well, I think that, in simple terms, the university should hire a faculty of=  
 15 C: Let's Lets start with the busie business=  
 16 A: = diverse experience to better compensate for the whole variety of class available.  
 17 C: =dept.  
 18 (4.8)  
 19 B: are you saying diverse experiences in different work situations=  
 20 C: \*\*\*<20>  
 21 A: No, diverse experience as far as the three categories we are analyzing.\*<4>  
 22 B: =among professors in the same field of expertise, or diverse lengths of time=  
 23 C: a stop: :::(4)we need to store some of this info.....(23.7)  
 24 do we know how?  
 25 B: =the workplace\* <3> s\* <9> That sounds like a good long-term goal- to me. ss\* <3>  
 26 A: C - the computer stores † the information auto matically.  
 27 B: I'm new on this system. (12.5)\* <5> I believe=  
 28 C: \*\*\*<13> ok \*\*\*<120.5>  
 29 B: =in any organization, if ~~all + all s~~ all of the members share similar experiences then  
 30 they will be more productive,=  
 31 A: \*<0>What do you mean by similar experiences?  
 32 B: =unless theysssss th \* <3.2> I mean the that if we try to hire  
 33 diverse (17.1) people with diverse backgrounds and put them on the same staff  
 34 there is bound to be † frictions, or as the handout a states, fragmentation.  
 35 A: \* <0> Our first concern is for the students,  
 36 not the staff.  
 37 C: That is ~~wat~~ what makes college so important  
 38 B: \* <0> If we-re concerned for the student then we want to build  
 39 productive departments headed by people who fcan get things done, with members=  
 40 C: \*\*\*<30>  
 41 B: =sharing common goals. \* <6>  
 42 (7.6)  
 43 A: \* <0>The first criteria for hiring would be that the person would put the goal of=  
 44 C: MWU should find qualified peol people  
 (40.9)=  
 45 A: =getting the students an education over those of getting along with all coworkers.  
 46 B: thats a good

- 47 point, (4.8) can we form some sort of test for dedication to education.
- 48 A: \*<0>C - What kind of qualities should these people have?
- 49 C: =who come from different areas to give some ~~type~~ type of color.
- 50
- 51 (15.6) Not just educational (5.3) , get some head on experience in the real world.
- 51 A: So do
- 52 you think it is important to have a diverse faculty, or a faculty who are all experts
- 53 in one area?
- 54 B: \*<162>
- 55 (14.6)
- 56 C: \*<3>We must have diverse faculty , because that gives the ~~student~~ student ~~be~~ a (9.2) better
- 57 understanding from wich direction the teacher is ~~go~~ coming from
- 58 A: \*<0>One of the negative side effects of having a faculty who are all specialists in one
- 59 area is that the students need information about everything
- 60 in their chosen field, not just one area.
- 61 B: You wouldn't want to hire specialists in one area or the base to work from would
- 62 be narrow. You do want to consider?
- 63 A: \*<0> So do we all agree that we should hire a faculty whose=
- 64 C: \*\*<10> I (41)=
- 65 A: =members all excel in different areas of expertise?
- 66 B: \*<0>Yes; ~~heress~~ here. \*<10>s\*<46>
- 67 C: =agree
- 68 (18.4)
- 69 A: \*<0>Then all we have to do now is set guidelines for hiring those people. (5.5)
- right? \*\*<100>
- 70 C: \*\*\*<17>
- 71 B: \*\*\*<15>s\*\*\*<2>
- 72 (28.3)
- 73 B: WHAT ~~CRITRION~~ ~~CRITERION~~ CRITERIA SHOULD WE SUGGEST#/?
- 74 C: we must hire peopl from different schools around the country ~~inorder~~ ~~ti~~ to=
- 75 B: \*<160>
- 76 C: =bring in new ~~ideal~~ ideas...
- 77 A: Good point., (9.5) but geography isn't the most important thing to consider,
- 78 although it ~~does~~ is important to have ~~bn~~ new ideas.\*<9>
- 79 (18.4)
- 80 A: In each college, there are intro classes. I think that instructors for those classes
- 81 should have more real-world ~~exp~~ experience ,=
- 82 C: \*\*\*<10>
- 83 B: Good point,
- 84 A: =because the intro classes are just that - an introduction and not a 4000 level
- course.
- 85 C: I (5.8) agree with A
- 86 B: I feel that upper division ~~elall~~ ea classes
- 87 are where people with research backgrounds should b teaching.\*<154>
- 88 C: \*\*\*<2.5>
- 89 A: \*\*\*<0>When interviewing, ~~we~~ the University can surely find enough qualified people ~~why~~
- who
- 90 have at least two ~~or~~ of the three traits the sheet talks about. Therefore, they can easily find
- 91 someone with real-world experience and instructional skills to teach the lower level

- 92 ~~course~~ courses, while finding people with research and instructional skills to teach the upper=  
 93 C: On the ~~negatie~~ negative side it may ~~tal~~ take longer but ~~is~~ it will pay off.  
 94 A: =level courses.  
 95 (12.7)  
 96 C: \*\*\*<135>  
 97 A: \*<0>Right/.  
 98 B: \*\*<0>So we want to hire positions to teach specific classes?\*<10>  
 99  
 100 can?  
 102 B: If we are basing ~~out~~ our decision on a ~~s~~ class that needs an instructor,~~la~~ the guidelines  
 103 A suggested seem to (8.0) ~~t~~ meet our requirements.\*<8>  
 104 A: \*\*\*<10>  
 105 (5.8)  
 106 A: ~~The~~\*\*\*<23>  
 107 B: DOES THAT MAKE SENSE?  
 108 C: so we all agree with A ?  
 109 (6.7)  
 110 A: OK, Then are we saying that, as student delegates to a committee on hiring, we would=  
 111 B: \*\*\*<107>  
 112 A: =suggest that the university hire 1) an instructor who possesses both research and=  
 113 C: \*\*\*<93>  
 114 A: =instructional skills for upper level courses, and 2) an instructor who possesses  
 115 both real-world experience and instructional skills for lower level ~~course~~ courses?  
 116 (7.8)  
 117 B: ~~THAT~~ That (8.2) sounds like a final draft to me.  
 118 C: yes (34.8) it is- looks good to me.  
 119 A: \*<0>Would those be the only criteria we would use? Remember we must consider the  
 university's=  
 120 B: \*<56>  
 121 A: =strong ties to our state's business, and the continued emphasis on quality education.  
 122 B: \*\*<0>C - DO YOU THINK that we have enough with A's suggestion to give  
 positives,  
 123 negatives=  
 124 A: \*\*\*<2> I think we have enough, I just wanted to make sure that both of you do too.  
 125 B: =and justify our position.\*<100>  
 126 C: =\*\*\*<0>I think ~~the the~~ that ~~wl~~ we do we stated that the people we hire should be diverse=  
 127 and ~~the a~~ that will inable students to get a better understanding of the out side ~~wol~~ world  
 128 A: \*\*\*<33>  
 129 C: =and ~~the thm~~ make them want to stat in this state;;;;  
 130 (8)  
 131 A: OK- what are the positive and negative effects of hiring a faculty under the=  
 132 B: \*\*\*<7> positive - - =  
 133 C: \*\*\*<7>  
 134 A: =guidelines we ~~agrr~~ agreed on?  
 135 C: What I ~~jut~~ just said could be a positive.  
 136 B: =the students are told the importance of what they study in intro classes by people=  
 137 C: \*<0>a neg could be the ~~exter~~ extra time put into the hirng ~~peccedd~~ peocess.  
 138 B: =who have had success with the topic- ex., accountingssssss ~~If a g~~



- 139 A: \*\*\*<0>Positive- Students get ~~an~~ a well rounded education in their chosen field.  
 140 B: \*\*\*<178>  
 141 A: \*<0> Negative-Money put into trying to find the right kind of faculty ~~member~~ member for  
 the=  
 142 C: \*\*\*<34>  
 143 A: =position.(6.3) Anything else?  
 144 (2.4)  
 145 C: Positive- ~~pep~~ people ~~wø~~ want to stop in OK because of different backgrounds the  
 professor=  
 146 A: \*\*\*<60>  
 147 C: =coul have shared with them..  
 148 (2.2)  
 149 A: One other negative is that the students=  
 150 C: \*\*\*<162>  
 151 A: =won't be ~~str~~ strong in one specific field=  
 152 B: Negative-  
 153 A: =of expertise, but will just be very well informed in all basic areas.  
 154 B: =students in upper level classes that are research intensive may not learn about how  
 155 things are applied in the real world (ssay for ~~exapoi~~ example, how the business world  
 156 operates).  
 157 professors with real-world ex.  
 158 A: \*<0>We could also design new classes=

## Appendix A

### Task B

One persistent problem in hiring and evaluating university faculty is finding candidates adept in research, instructional skills, and with enough real-world business experience to impart to their students. In many cases an individual excels in one area, but falls short in another. One remedial strategy is for a department to hire a variety of faculty members whose strengths are complementary to one another. However, this approach may be a mediocre compromise which also creates a fragmented faculty. Alternatively, a department could hire all its faculty from within a single category of expertise, creating a strong specialty and reputation for the one thing it does best. This approach, too, may be flawed; students' breadth of exposure may be limited in such a place.

You have been asked to serve as student delegates to a university committee on hiring for the 1990s. Considering this university's strong research mission, its ties to the state's business, and the continued call for emphasis on quality education, what practical strategies should the university adopt in recruiting and hiring new faculty? Your final answer should take the form of a short policy proposal giving your position, positive and negative impacts of your decision, and justification for your choice. Indicate in the conference your final solution, for the record.

FINAL ANSWER must be a group decision, and must be clearly indicated as your group's final decision.

When you finish your task, tell the lab assistant, and he/she will direct you to complete post-discussion questionnaires.

You will be graded based on the FREQUENCY of your participation and the QUALITY of your group's answer.

## Appendix B

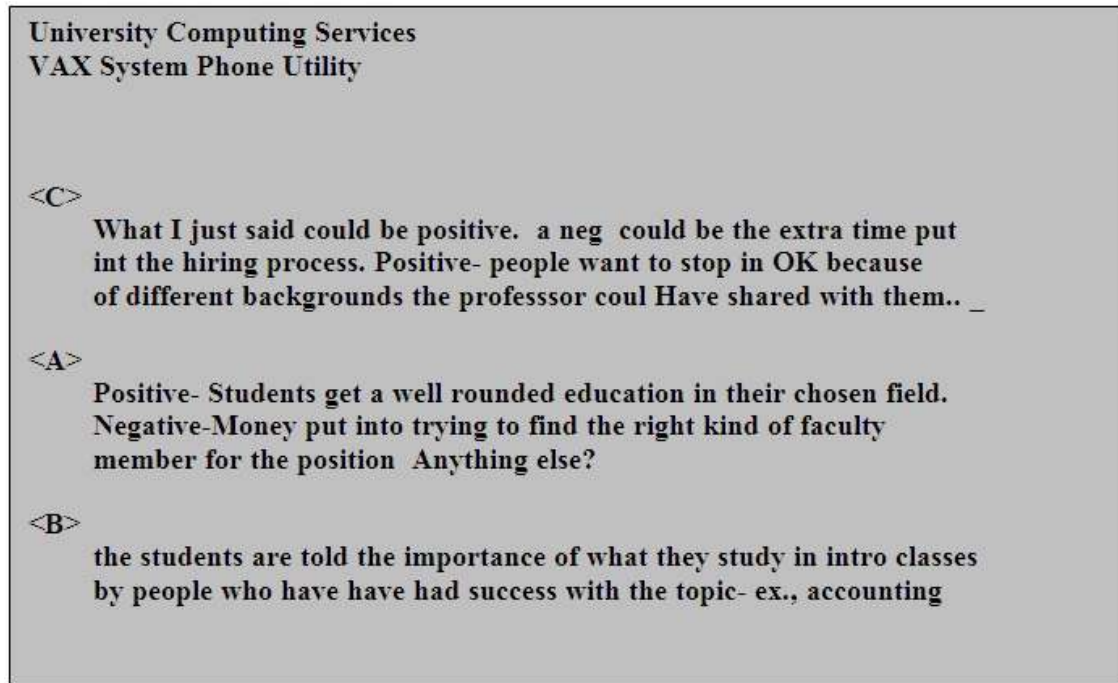


Figure 1. Drawing of computer screen as viewed by participants

*Note:* This diagram shows how messages appeared as each participant viewed his or her screen. Imagine that this is participant C's (actual names were on screen during live session) screen, with the cursor (underline character) following the last word "them" with two dots and one space. Note that participant B has "refreshed" the screen and therefore has text only on the two top lines, with the bottom line blank at this point.

## Appendix C

### Conversation Transcript Notation

1. Overlapping Utterances    double underline is a participant's utterance that overlaps with a preceding participant's utterance
2. Contiguous Utterances    =
3. Intervals within and between utterances (0.0)    (seconds and/or tenths of a second)
4. Line Refreshed followed by time (seconds) until next utterance  
     One line    \*<0.0>  
     Two lines    \*\*<0.0>  
     Three lines    \*\*\*<0.0>
5. Characteristics of Speech Delivery    (punctuation is as typed-in by participants) except when enclosing time for pauses
6. Corrections (overstrike indicates deletions of text by typing over characters or backspacing over incorrect characters)  
     ~~ovrstrikd.~~ overstrike

## Appendix D

	A	B	C	Overlap	Row Totals
A Selects B					
31		32-34			1
101		102, 103			1
A Selects C					
48			50		1
51-53			56, 57		1
A Selects Both					
63, 65				B-66; C-64, 67	2
69				B-73qwq; C-74	2
110, 112, 114, 115				B-117, C-118	2
119	(No	Second	Pair	Part)	0
131, 134				B-132, 136, 138; C-135, 137	2
143			145, 147		1
B Selects A					
19, 22	21				1
47	(No	Second	Pair	Part)	0
107			108 qwq		1
B Selects C					
122, 123, 125			126, 127, 129		1
B Selects Both					
01	02, 04, 05		07		2
03	(No	Second	Pair	Part)	0
12				A-14, 16; C-15, 17	2
73	(No	Second	Pair	Part)	0
98	101 qwq				1
C Selects A					
24				A-26; B-27	2
C Selects Both					
108	110, 112, 114, 115				1
Column Totals	4	2	6	12	24

Table 1. Instances of current speaker selects next speaker for each participant and of next speaker taking turn offered

*Note:* Table 1 shows who the current speaker was and the line number from the data when he or she chose the next speaker in the far left column, and the next four columns show who and which line supplied the second pair part. The current speaker addressed the other speaker (e.g., speaker A addressed either B or C or both) by addressing him or her specifically (see transcript), by topical coherence (repeating the topic another participant initiated), or by simply asking a question for all to contemplate. The bottom row is the total of incidences for that speaker to one or both the other two participants for that column. The last column is the total number for all participants. Several symbols used identify the turn as qwq (question in response to a question) and No Second Pair Part, when the speaker selected the next speaker in a first pair part but no one responded with a second pair part.

A			B			C			Total
Normal	Overlap	Interrupt	Normal	Overlap	Interrupt	Normal	Overlap	Interrupt	
09,10	31	124	01	38,39,41		118	28	23	
43	35		12	61		135	37		
48	63,65		19	86,87			44		
69			47	152			85		
77,78			83				93		
80,81			98				137		
89-92			107						
97			117						
119,121			122,123						
131,134			132,136, 138						
139			152,154- 157						
141,143									
149,151									
158									
14	3	1	11	4	0	2	6	1	42

Table 2. Instances when current speaker self selects

*Note:* Table 2 shows who the present speaker was when he or she selected to take a turn at talk. Self selection took place when a participant took a turn without being addressed personally or without a request to respond. Instances of normal vs. overlap vs. interrupt were distinguished and counted. The last column is the total number for all participants.

A			B			C			Total
Normal	Overlap	Interrupt	Normal	Overlap	Interrupt	Normal	Overlap	Interrupt	
69			12	25		24	49		
77			32	27		50	85		
			33			56-57			
			47			103			
			117			118			
						143			
2	0	0	5	2	0	6	2	0	17

Table 3. Instances of current speaker continuation

*Note:* Table 3 shows who the present speaker was when he or she selected to continue to take a turn after a turn at talk. Current speaker continuations are instances when a speaker had a contiguous utterance (noted by =) without any pauses. Instances of normal vs. overlap vs. interrupt were distinguished and counted. The last column is the total number for all participants.

Participants	A	B	C	Row Totals
Turns at Talk	26	29	28	83
Refresh Lines	22	18	39	79
Total Activities	48	47	67	162

Table 4. Number of instances of turns, refresh line, and total activities

*Note:* Table 4 shows each participant's number of turns at talk, times a line was refreshed with no characters typed, and total activities (turns plus refresh line). Totals for all participants for each measure are in the last column.

### **Biographical Notes**

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