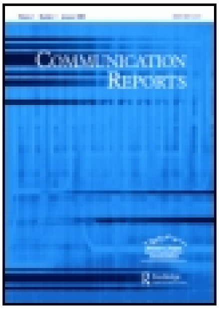

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Conversational Multitasking in Interactive Written Discourse as a Communication Competence

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Conversational Multitasking in Interactive Written Discourse as a Communication Competence

Eli Dresner & Segev Barak

Conversational multitasking is a distinctive property of synchronous, textual computer-mediated communication (CMC); it can be characterized as a new aspect of communication competence that CMC gives rise to. In this study it is tested how this capacity is affected by separation of conversation threads spatially and through color. Two conversation threads were presented to participants in three conditions: (1) in two distinct windows; (2) intertwined within a single window, without differentiation of color; and (3) intertwined in the same window, as in condition 2, but distinguished through color. Recognition (multiple-choice) tests showed significant differences between the three conditions, where the first (two windows) yielded the highest scores and the second (same window without differentiation of color) yielded the lowest. The significance, implications and limitations of these results are discussed.

Keywords: Interactive Written Discourse; Chat; Multitasking; Communication Competence

Communication competence can be broadly characterized as "the ability to communicate and interact with others in a way that is appropriate and effective" (Segrin & Flora, 2000, p. 489). A variety of distinct definitions and analyses of this notion have been suggested by different scholars, and hence it may be agreed upon that "communicative competence is not so much a single concept as a broad

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conceptual vehicle for summarizing a host of more specific concerns and commitments'' (Parks, 1994, p. 592). However, as Duran & Spitzberg (1995) argue, it is widely accepted that communication competence involves cognitive, affective, and psychomotor skills. Some of the most basic cognitive communicative skills have to do with interaction management (Wiemann, 1977)—the ability to sustain the procedural aspects of face-to-face (linguistic) interaction. Indeed, Wiemann (p. 199) labels interaction management as the ''*sine qua non* of [communication] competence.''

Communication competence is typically conceptualized as pertaining to face-to-face communication, but the notion clearly applies to mediated interpersonal communication as well. In particular, the recent phenomenal rise of computer-mediated communication (CMC) requires us to reconsider extant analyses of communication competence and examine (both theoretically and experimentally) whether and how they need to be adjusted in order to account for peoples' ability to interact and achieve their communicative goals online. Thus a variety of recent studies of textual CMC show how users of the new medium compensate for the lack of audiovisual cues and manage to demonstrate control, adaptation and collaboration (Spitzberg & Cupach, 1989) in interaction over the Net (Baym, 1996; Gallegher, Sproull & Kiesler, 1998; Tidwell & Walther, 2002). Even if many of these studies do not say so explicitly, they involve a reorientation of the notion of communication competence and an implicit adjustment of its factorization to the new textual environment.

The purpose of this study is to investigate one of the novel aspects of synchronous textual CMC that has not been acknowledged so far for what it is—a new cognitive communicative skill. The competence in question is *conversational multitasking*—the ability to follow and take part in several textual conversational interactions at the same time. CMC users manifest this ability in a variety of Interactive Written Discourse (IWD) contexts (Ferrara, Brunner & Whittemore, 1991; Werry, 1996): Internet Chat in its various forms, Instant Messaging applications, and textual virtual worlds (e.g., MUDs and MOOs). In all of these contexts several conversation threads unfold concomitantly on the user's screen—either within the same text window, or in different windows—and the user (especially if he or she is experienced) manages to juggle them and keep track of them all together.

Discussion of multitasking can hardly be found in communication literature. The term itself is most often used in computer science, and, derivatively, in the domain of Human-Computer Interface (HCI). However, in HCI the different tasks that are attempted concomitantly are not necessarily communicative (Wild, Johnson, & Johnson, 2003). Another related (but distinct) domain is the study of divided attention in psychology. Here the phenomenon of interest is defined in terms of cognitive resources (division of attention) rather than in terms of goals (performance of multiple tasks), and, of course, it is not focused on questions of communication. Within the domain of communication we find scholars of interpersonal communication acknowledge the multidimensionality of face-to-face communication (Burgoon, 1994), where participants are attentive to several channels of information at once (verbal vs. nonverbal ones), but, again, this phenomenon is distinct from taking part in several concomitant conversations—which is the subject matter of our interest here. Computer-mediated textual conversational multitasking can therefore rightly be described as an emerging communicative competence, and as such it deserves our attention: in the not-too-far future it may become an important conversational capability, and we need to acknowledge it and understand it.

The intermingling of distinct conversational threads within a single chat-window is discussed in detail by Herring (1999). Herring characterizes this phenomenon negatively, as an example of the reduced conformity of chat-conversation with interactional coherence standards of auditory conversation. The reasons for this reduced conformity, as she rightly observes, are that users' messages (as well as system messages) appear on the users' screens in the exact order in which they are received by the system, without attention to content, and that textual CMC lacks conversational cues that are available in face-to-face communication (Kellermann, Reynolds, & Chen, 1991; Knapp & Miller, 1994). However, here we propose to complement Herring's account and look at the glass as half full—i.e., ask how chat users adapt to this partially chaotic environment and are able to follow several conversational threads at the same time.

Turkle (1995) is another scholar who makes an indirect appeal to textual conversational multitasking. Turkle shows in great detail how participants in textual virtual reality environment create several distinct personas, each in a different (textually constituted) world, and sometimes play several of these roles at once. Thus the psychological implications that Turkle ascribes to this aspect of 'Life on the Screen' (e.g., the more loosely integrated self we allegedly have online) depends on textual conversational multitasking—a capacity that Turkle takes for granted.

So what is the source of the ability to engage in conversational multitasking in text, that seems to surpass the similar ability to multitask in standard, auditory conversation? A reasonable suggestion (Herring, 1999) is that the *visual* modality, through which we perceive the written text, provides us with superior perceptual resources (as compared to hearing) that help us sort out concomitantly occurring conversation threads. The objective of this research is to examine this suggestion experimentally.

Turkle's discussion suggests a first variable that should be positively linked to enhanced ability of conversational multitasking: spatial separation among conversation threads, as exhibited, for example, in concomitant participation in different virtual worlds or chatrooms, taking place as distinct windows on the screen. The distinct spatial location of each window on the screen supports a cognitive separation between the different textual conversations. Thus our first research hypothesis is this:

> H1: Two (or more) textual conversation threads are easier to follow when spatially separated than when they are intermingled with each other.

A second variable that may be positively related to improved following of concomitant conversation threads within the same window is the separation of such threads through the use of color. In many chat interfaces distinct users are allocated distinct colors; the underlying (albeit experimentally untested) assumption of such an allocation is that individuation of each participant through color should contribute to users' ability to follow the conversation. An individuation of a complete conversation thread (as opposed to a single voice) seems likely to be even more effective in enhancing users' ability to follow the conversation, because it distinguishes a complete semantic sequence, and hence we get our second research hypothesis:

> H2: Two (or more) textual conversation threads are easier to follow when distinguished through color than otherwise.

Once these two visual forms of separation of conversational threads are considered, it is natural to raise the question how they compare to each other, whereby we get the following research question:

> RQ3: Which type of separation of conversational threads (through space or through color) contributes more to conversational multitasking?

This objective of our research is phrased as a research question rather than a research hypothesis because we approached it without clear intuitions.

A variable that will not be considered directly in this study is the amount of text on the screen at any given moment (i.e., overall window(s) size). There are studies showing that this variable is positively related to the memorizing and understanding of synchronously moving digital text in general (Duchnicky, 1984; Xu & Fu, 2002); hence we did not examine it here, as in this study we are particularly interested in conversational multitasking.

The hypotheses were tested experimentally through the use of a computerized chat-simulation program. Two independent dialogues were concomitantly presented to each participant in one of three conditions: (1) The two conversation threads were presented in distinct windows in black text; (2) the conversations were intertwined within a single window, without differentiation of color; (3) the conversations were presented in the same window, as in condition 2, but distinguished through color. After being exposed to the dialogues, participants completed a multiple-choice test assessing their recognition of factual details that were mentioned during the conversations. Our hypotheses predicted that participants in condition 2 would score less than participants in condition 1 (H1) and in condition 3 (H2). The choice of recognition as the dependent measure rather than recall (or a more demanding test of comprehension) was made due to the difficulty of the cognitive (multiple-) task faced by the participants in the experiment. Following two conversations at once is not an easy feat, even for experienced CMC users, and therefore, in order to avoid a flooring effect, we chose a basic measure of text comprehension, that offers the best chances for relatively higher scores (Hulse, Egeth & Deese, 1980, p. 281; Sternberg, 1999, p. 155).

Method

Participants

Eighty-two undergraduate and graduate students in communication and psychology (55 females, 27 males) participated in the experiment (thereby fulfilling a part of their degree requirements). The participants were 20–39 years old (mean age 23.68), and were all native Hebrew speakers. The mean of computer use was 2.86 hours a day and the mean of daily Internet use was 1.62 hours.

Apparatus

Computerized chat-simulation

The hypotheses were tested experimentally through the use of a computerized chat-simulation program (Bright-Aqua Technologies Ltd, Israel). Two 20-lines Hebrew conversation threads were presented to all participants. (Translations of the dialogues can be found online at http://spirit.tau.ac.il/com.) In one of them, two students (a female and a male) discuss a recent exam and a future movie date, and in the other two, Internet chatters (again a female and a male) discuss a possible get-together. Both dialogues were fabricated, and are not claimed to be representative of typical chat conversations; the cognitive phenomena that are being examined in this study are of a general nature, and therefore it was not required that actual chat conversation be exactly mimicked or reproduced.

The lines of text accumulate in typical chat mode—that is, each new line begins with the name of its author (followed by a semicolon), and appears below the previous line; when the window becomes full, new lines push older ones out of sight. The dialogues could be viewed in three different conditions:

1. *Two windows*: The two conversations were spatially separated, each presented in its own window (each window was 225 pixels high and 400 pixels wide, 10 text lines long). A new line of text was added every 6.1 seconds on the left window and 5.9 seconds on the right window (the intervals were unequal in order to prevent simultaneous accumulation of lines in the two windows). The windows closed 7 seconds after the conversations ended.
2. *One window black*: The conversation threads were intertwined within a single window (450 pixels high and 400 pixels wide, 20 lines long), all in black, without differentiation of color. A new line of text was added every 3 seconds.
3. *One window color*: The conversations were presented as in condition 2 except that the dialogues were distinguished through color—one conversation thread (including two participants) was black and the other red.

Thus in all three conditions presentation duration was the same (approximately 124 seconds) and the same amount of text was presented in any given moment.

Multiple-choice test

The participants' ability to follow the conversations was measured using a hard-copy, multiple-choice test that was completed immediately after the conversations ended. (A translation of test to English may be requested from the lead author.) The multiple-choice examination was the same for all conditions and consisted of 20 questions, 10 regarding each conversation thread (grouped together under distinct headers—the first 10 questions about one dialogue and the next 10 questions about the other). Each question had five answers (four of which were distracters and one was the correct answer). All questions were factual, concerned with specific details that were mentioned during the conversations. The internal reliability of this test (Cronbach's alpha), was 0.71. Total test scores ranged from 30% to 90% correct answers, with mean of 60.96% ($SD = 17.1$).

Procedure

Participants were seated by the experimenter in front of a computer screen where the instructions for the experiment were presented. The instructions preceding each condition described what the participant should expect. When the participant finished reading the instructions she pressed a button, after which the window(s) with the textual conversations that she was instructed to follow appeared on the screen. Each participant was assigned one of the three experimental conditions ($n = 27$–28 per each group). The order of the conditions was random. The participant was a passive observer of the textual conversations—she could not take part in them.

When the conversations ended the chat-window(s) closed and a message appeared, prompting the participant to receive from the experimenter the (hard-copy) multiple-choice test examining her understanding of the textual conversations she viewed. After completing the multiple-choice test, participants completed general information forms, including age, gender, and experience with computers and Internet chat.

Results

Both the two-windows group (mean proportion of correct answers $= 71.25$, $SD = 13.99$) and the one-window-color group ($M = 62.59$, $SD = 16.14$) scored higher than the one-window-black group ($M = 49.44$, $SD = 17.34$), in accord with H1 and H2, respectively. In addition, the two-windows group scored higher than the one-window-color group. These results were supported by significant Fisher planned pair-wise contrasts (PLSD; $p < .0001$, $p < .0035$, $p < .05$, respectively). The effect sizes for the comparisons (Cohen's **d**) were 1.39 (2-windows vs. 1-window-black), .57 (2-windows vs. 1-window-color) and .79 (1-window-color vs. 1-window-black). Proportion of correct answers did not correlate with level of computer or Internet use, nor with chat or instant-messaging software (IMS) experience.

Discussion

The confirmation of hypotheses 1 and 2 supports the hitherto untested premise that the separation between conversation threads through space and color helps participants follow textual conversations better. As indicated in the opening section of this article, these finding supports the characterization of conversational multitasking as an emergent cognitive communication competence in IWD by relating it to distinctive aspects of visual perception. Thus the new medium of interpersonal interaction requires us to redefine our notion of communication competence.

The answer to research question 3—that spatial separation is clearly superior to separation through color as a means of enhancing recognition—is somewhat surprising. Spatial separation requires the user to turn her visual attention back and forth between two (or more) loci on the screen, a fact that seems to be a drawback of this mode of presentation (because, among other reasons, such flipping of attention is not familiar from standard, linear reading). However, it turns out that this disadvantage is more than compensated by the advantages of spatial separation: such separation sorts out the different conversations that take place and presents each of them continuously (i.e., text lines that constitute the conversation follow each other directly). This outcome is consistent with more general findings in the study of visual perception, that differences of color draw much less visual attention than differences in spatial location (Tsal & Lavie, 1993).

The results of this study bear upon several areas of communication research. As noted above, textual synchronous CMC is employed in a variety of contexts and for different purposes—for example, immersion into virtual worlds, involvement in chats of various social characteristics, exchanges of instant messages, and participation in virtual workgroups. Once the general phenomenon of conversational multitasking is acknowledged and empirically demonstrated it can (and should) be asked what its uses and implications vis-à-vis each of these contexts are. Can the psychological ramifications that Turkle relates to this capability be found in other contexts? Is conversational multitasking associated with greater efficiency in goal-oriented interactions? What kinds of interaction are better suited for multitasking and what kinds are not? The study of these interesting questions (some of which are already examined, e.g., by HCI researchers [Wild et al., 2003]) can benefit from the work reported here.

On a more general and theoretical level, our results can be viewed as substantiating and generalizing one of McLuhan's famous (some would say notorious) claims with respect to print—that the visual structure of the printed text supports semantic complexity of expression and thought (McLuhan, 1962). We see that the problematic scientific status of McLuhan's original claims notwithstanding, our own study confirms the notion that the visual spatial structure of text supports semantic complexity, albeit complexity of a different kind than the one ascribed by McLuhan to asynchronous, traditional printed text. Therefore we suggest that the visual structure of text should be characterized as a *resource* that is used for different communicative purposes in different technological, cultural, and social contexts: In traditional printed text such structure may enhance logical and semantic complexity and elaboration (if McLuhan and, e.g., Ong 1982 are right), while in IWD the same resource supports a substantially different type of complexity—synchronous multithreaded conversation.

The limitations of the present study in evaluating conversational multitasking should be acknowledged. The dependent measure we used—text recognition—is not sufficient to assess all aspects of text comprehension. Active participation in the interactions, for example, surely requires more than recognition, and future work should test how such participation is affected by multitasking. Also, the differences between different kinds and applications of IWD (as listed above) were not addressed here: The two interactions presented were social conversations, and other kinds should be examined as well.

The effects of visual parameters—for example, window(s) size and distance between windows—should be researched in greater detail. Another avenue that warrants attention following this work is a direct experimental comparison between conversational multitasking in textual and spoken language. Yet another interesting question is whether bilingual participants, presented with dialogues in distinct languages, will do better in conversational multitasking than participants presented with dialogues in the same language. Thus we believe that this line of research raises interesting and important issues regarding Interactive Written Discourse in particular, CMC in general, and, even more broadly, the interplay between text and cognition.

References

Baym, N. (1996). Agreements and disagreements in a computer-mediated discussion. *Research on Language and Social Interaction*, *29*, 315–345.

Burgoon, J. (1994). Nonverbal signals. In M. Knapp & G. Miller (Eds.), *Handbook of interpersonal communication* (2nd ed., pp. 229–285). Thousand Oaks: Sage.

Duchnicky, R. (1984). Readability of text scrolled on visual display terminals as a function of window size. *Human Factors*, *25*, 683–692.

Duran, R., & Spitzberg, B. (1995). Toward the development and validation of a measure of cognitive communication competence. *Communication Quarterly*, *43*, 259–275.

Ferrara, K., Brunner, H., & Whittemore, G. (1991). Interactive written discourse. *Written Communication*, *8*, 8–34.

Gallegher, J., Sproull, L., & Kiesler, S. (1998). Legitimacy, authority and community in electronic support groups. *Written Communication*, *15*, 493–530.

Herring, S. (1999). Interactional coherence in CMC. *Journal of Computer Mediated Communication*, *4*.

Hulse, S., Egeth, H., & Deese, J. (1980). *The psychology of learning* (5th ed.). New York: McGraw-Hill.

Kellermann, K., Reynolds, R., & Chen, J. (1991). Strategies of conversational retreat: When parting is not sweet sorrow. *Communication Monographs*, *59*, 288–300.

Knapp, M., & Miller, G. (Eds.). (1994). *Handbook of interpersonal communication* (2nd ed.). Thousand Oaks: Sage.

McLuhan, M. (1962). *The Gutenberg galaxy*. Toronto: Toronto U. Press.

Ong, W. (1982). *Orality and literacy*. London: Methuen.

Parks, M. (1994). Communication competence and interpersonla control. In M. Knapp & G. Miller (Eds.), *Handbook of interpersonal communication* (2nd ed., pp. 589–618). Thousand Oaks: Sage.

Segrin, C., & Flora, J. (2000). Poor social skills are a vulnerability factor in the development of psychosocial problems. *Human Communication Research*, *26*, 489–514.

Spitzberg, B., & Cupach, W. (1989). *Handbook of interpersonal competence research*. New York: Springer-Verlag.

Sternberg, R. (1999). *Cognitive psychology* (2nd ed.). Fort Worth: Harcourt Brace College Publishers.

Tidwell, L., & Walther, J. (2002). Computer-mediated communication effects on disclosure, impressions, and interpersonal evaluations. *Human Communication Research*, *28*, 317–348.

Tsal, Y., & Lavie, N. (1993). Location dominance in attending to color and shape. *Journal of Experimental Psychology: Human Perception and Performance*, *19*, 131–139.

Turkle, S. (1995). *Life on the screen*. Cambridge, MA: MIT Press.

Wiemann, J. (1977). Explication and test of a model of communicative competence. *Human Communication Research*, *3*, 195–213.

Werry, C. (1996). Linguistic and interactional features of internet relay chat. In S. Herring (Ed.), *Computer mediated communication: Linguistic, social and cultural perspectives* (pp. 47–64). Amsterdam: Benjamins.

Wild, P., Johnson, P., & Johnson, H. (2003). An hour in the life: Towards requirements for modelling multiple task work. *CHI Extended Abstracts*, 1016–1017.

Xu, B., & Fu, Y. (2002). Effects of display rate, jump length and window size on the readability of moving Chinese texts on VDTs. *Psychological Science China*, *25*, 94–95.