



Letter repetitions in computer-mediated communication: A unique link between spoken and online language



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ABSTRACT

Computer-mediated communication (CMC) affords many CMC cues which augment the verbal content of the message: all uppercase letters, asterisks, emoticons, punctuation marks, chronemics (time-related messages) and letter repetitions, to name a few. Letter repetitions are unique CMC cues in that they appear to be a written emulation of a spoken paralinguistic cue – phoneme extension. In this study we explore letter repetitions as a CMC cue, with specific emphasis on elucidating the link between them and spoken nonverbal cues. The letter repetitions are studied in the Enron Corpus, a large ecologically valid collection (~500,000) of e-mail messages sent by and to employees of the Enron Corporation. We conclude that letter repetitions in the corpus often, but not always, emulate spoken nonverbal cues. This conclusion is examined in a longitudinal analysis that demonstrates the dynamic nature of this cue, and suggests that the usage of letter repetitions is increasing over time, while the link to spoken language is diminishing.

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1. Introduction

One of the tools used to convey important social and relational information in computer-mediated communication (CMC) are CMC cues.¹ The information the cues convey cannot be extracted from the lexical or literal meaning of the words that comprise the message, and their creation and interpretation are context dependent and complex. These characteristics of CMC cues are reminiscent of the characteristics of nonverbal cues in traditional communication (Burgoon & Hoobler, 2002). These traditional cues have been defined as “those behaviors that could reasonably function as messages within a given speech community. More specifically, it includes those behaviors other than words themselves that form a socially shared coding system” (p. 244). In this paper, we use the term CMC cues as an analog to traditional nonverbal cues, and define CMC cues as *those modifications of a CMC message that, within a socially shared coding system, modify the meaning of the message while preserving the words of the message and their sequence.*

This paper focuses on elucidating the mechanism by which one category of CMC cues, letter repetitions, are used to enrich online

language. We begin the introduction with a brief review of the controversy over the richness of online language, and show that although the emerging consensus is that CMC is capable of conveying social and relational information, our understanding of the mechanisms through which this capacity is achieved is inadequate. We then focus on elucidating some of these mechanisms in letter repetitions through an in depth analysis of a large corpus of CMC messages.

Over the past two decades, there has been a great deal of debate in the literature about the richness of text-based computer-mediated communication (CMC). Media richness theory labeled CMC as poor in relation to other media such as face-to-face or phone communication (Daft & Lengel, 1986), and the cues filtered out model emphasized the impoverishment of CMC given its reduced social context cues (Sproull & Kiesler, 1986). Later work tried to explore the impact media leanness has on the outcomes of group decision making (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002; Dennis & Kinney, 1998), on online collaboration (Kerr & Murthy, 2009), in very large groups (Lowry, Romano, Jenkins, & Guthrie, 2009), and more (e.g. Otondo, Van Scotter, Allen, & Palvia, 2008; Sia, Tan, & Wei, 2002). The results suggest that the early theories could not account for the mounting evidence that CMC is being used extensively and effectively in contexts requiring subtle interpersonal and socially-oriented communication. More contemporary frameworks such as social information processing (SIP) and social identity/deindividuation (SIDE) theory (Walther,

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¹ The term CMC cues was suggested by Prof. Joe Walther in a personal conversation.

2011; Walther & Parks, 2002) explore the conditions under which CMC is as effective as traditional modes of communication, or even more effective. Both SIP and SIDE acknowledge that CMC does not transmit the same nonverbal cues that traditional spoken conversation does. Both also emphasize the importance of the cues which are transmitted in CMC. SIP puts special emphasis on chronemic cues and the importance of time in online communication (Walther, 2002). SIDE emphasizes paralinguistic cues, which includes alternative usage of characters in the written message such as capitalization, spelling, and punctuation marks (e.g. Lea & Spears, 1992). We review the evidence for the existence of CMC cues, their prevalence, and their usage, as well as the relatively scant research on the mechanisms that enable CMC to convey these socio-emotional cues. Following the review, we focus on one category of cues, letter repetitions, and explore their link to spoken nonverbal cues. We demonstrate the strength of this link in a large corpus of email messages from the late 20th century. In our discussion of these findings we present evidence that the usage of this CMC cue is dynamic, and that as its usage increases over time, the link to spoken language diminishes.

1.1. The cues we use online

In this section we review the cues used in CMC, starting with those that received more extensive attention in past research, namely chronemic cues and emoticons, and continuing with those that have not been studied as extensively. We conclude with a proposed definition for all CMC cues.

One category of cues that has been extensively studied with respect to its role in social communication is chronemics. Chronemics refers to time-related messages and the ways in which the temporal aspects of messaging influence communication. The pioneering experimental study of chronemic nonverbal cues in e-mail by Walther and Tidwell (1995) showed that response latency, as well as the time of day a message is sent, can influence one's perception of the communicator. They also demonstrated that these chronemic cues are context sensitive and can interact with message valence. Later studies of CMC chronemics further demonstrated how chronemic cues can influence the ways in which communicators perceive and make attributions about the social and interpersonal characteristics of those with whom they are communicating (Döring & Pöschl, 2008; Kalman & Rafaeli, 2011; Sheldon, Thomas-Hunt, & Proell, 2006).

Another category of cues that has received extensive attention is emoticons. Emoticons are graphical icons that express emotion, through the representation of a human face. They have been shown, under some conditions, to impact message interpretation (e.g. Derks, Bos, & von Grumbkow, 2007; Walther & D'Addario, 2001). Not unlike nonverbal cues in traditional communication, emoticons are employed in a highly context sensitive manner (Huffaker & Calvert, 2005; Wolf, 2000).

While chronemic cues and emoticons are the two most extensively investigated cues in the literature, there exist a large number of other CMC cues. One of the earliest experimental manipulations of these cues is described in a paper by Lea and Spears (1992). They describe two studies which explore the role of what they labeled as paralinguistic cues in CMC. In the first study, the messages either included or did not include (1) a spelling error in two words in the message; (2) two mistyped words in the message in which the sequence of a pair of letters was reversed; and (3) exclamation marks that were added to the end of one sentence and ellipses at the end of another. The results showed that minor changes in the paralinguistic content of the messages had a significant influence on the impression subjects formed of the anonymous authors of the messages. In the second study, the investigators collected transcripts of online discussions that took place between partners

who were either individuated or de-individuated, and who were placed under high or low group salience conditions. The transcripts were analyzed for a series of paralinguistic cues (ellipses, inverted commas, question marks and exclamation marks, as well as sequences of symbols). The results showed significant correlation between paralinguistic use and perceived personal attributes. For example, in a high group salience condition there was a strong positive correlation between the use of these paralinguistic cues and measures such as warmth, dominance, liking and responsibility. In the low group salience condition the correlation was either weakened or reversed. These studies lend support to the notion that paralinguistic cues can be a conduit of social information in CMC. In a later study, Postmes and colleagues (Postmes, Spears, & Lea, 2000), looked at the distribution of the same cues, as well as additional cues, in online groups that formed among students taking an academic course. The other cues included nonconventional spelling, deliberately distorted spelling, use of foreign language, capital letter "shouting", message length and chronemic aspects of the communication such as time of day and communication frequency. They show the gradual formation of diverse CMC styles in the different groups, styles which are defined by some of the CMC cues, but not by other cues. This is further evidence for the social meaning of CMC cues. Additional evidence for the role of CMC cues other than chronemics and emoticons in social communication comes from a study of short-message system (SMS) messages posted to a public interactive TV website (Herring & Zelenkauskaite, 2009). An analysis of the properties of 160-character SMS messages posted to the website showed that every message had 8–9 non-standard typographic features, and that a gender difference exists in relation to the usage of this nonstandard typography: women used more repeated punctuation and more insertions in their messages. The authors conclude that "the resources of written language are employed variably to communicate social meanings that are traditionally conveyed through speech" (p. 27).

While these latter studies begin to expand the notion of CMC cues beyond that of chronemic cues and emoticons, there still exist a large number of relatively unexplored cues in text-based CMC. In the next paragraph we describe some of the key studies that attempted to identify and classify text-based CMC cues.

One of the earliest studies of the wide range of CMC cues is Carey's (1980) work on paralinguistic cues in CMC. Carey identified five categories of cues which he designated as vocal spelling (e.g. "biznis" and "weeeeee"); lexical surrogates and vocal surrogates (e.g. "I like the idea, but then again, it was mine (she said blushing)") and "hmmm", respectively); spatial arrays which include letters arranged to make a picture, as well as tools such as extra spaces between words to indicate pause or set off a word or a phrase; manipulation of grammatical markers (e.g. multiple exclamation marks or words written in capital letters); and, minus features which is the absence of certain features in the text. This last cue lends a tone to the message such as in the case where no special attention has been given to correcting spelling errors. Another brief exploration of the strategies used to enhance and enrich the written word is by Spitzer (1986) who described a host of typographical devices or "gimmicks", such as usage of capital letters, asterisks, blank spaces, or character repetitions, as well as combinations of these devices. He describes how these are used for emphasis, to show anger, express humor, etc. The next extensive exploration into cues in CMC was by Blackman (1990). This work identified 22 types of nonverbal surrogates. These were divided into seven categories: Kinesic surrogates (kinesic descriptions such as <grin>, kinesic pictographs such as :-), and self pointing such as this arrow pointing at the source's name <====>); vocalic surrogates (multiple punctuation marks, all-caps, asterisk bracketing, extended letter repetition, spaces between letters, run-together words, ellipsis, blank spaces in line, vocal characterizations such

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