Latent Semantic Similarity in Initial Computer-Mediated Interactions
Moderating Effects of Time, Extraversion, and Gender Composition

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ABSTRACT

The development of latent semantic similarity (LSS; the extent to which interaction partners use words in the same way) was investigated in the initial computer-mediated interactions of 120 same-sex dyads in Study 1 and 111 same-sex dyads in Study 2. The significant effects in Study 2 replicated those obtained in Study 1. In both studies, the female-female dyads achieved higher LSS than the male-male dyads. Across all dyads, LSS decreased—rather than increased—over time. Comparisons of word usage over the course of the interactions suggested that the dyads were more motivated to achieve higher levels of LSS during the earliest phase of their initial interaction, but that this motivation tended to wane over time. An exception to this trend occurred in high extraversion dyads, where the level of LSS remained relatively high and consistent across the three time periods studied. A motivational interpretation of these findings is both plausible and parsimonious, and the present study is—to the best of our knowledge—the first to find evidence of motivational influences on LSS.

KEYWORDS

Computer-Mediated Communication, Dyadic Interaction, Extraversion, Gender, Language, Latent Semantic Similarity, Multilevel Modeling, Personality

INTRODUCTION

Computer-mediated communication (CMC) has become an increasingly popular method of communication since the internet was made available to the general public in the early 1990s. A significant (though as-yet-unestimated) percentage of CMC takes place between pairs of strangers. This situation is common, for example, on dating websites such as Match.com and eHarmony, which allow individuals to send and receive messages from new romantic prospects. It is also common in online forums such as Reddit and Quora, in which users can easily take part in conversations or answer questions that were initiated by other users; and on social networking websites such as Facebook and Twitter. As society becomes more technologically connected, CMC between strangers is likely to become easier and more commonplace than ever.

CMC[1] differs from face-to-face communication in important ways (Lee, 1996; Sproull & Faraj, 1995). Perhaps the most obvious difference is the lack of access in CMC to nonverbal behaviors that often portray meaning which is not communicated verbally. The many nonverbal indicators that are available in face-to-face communication, such as eye contact, facial expressions, gestures, and body orientation, are not portrayed in the same way (or at all) in CMC. CMC also often fails to convey

other important characteristics that people use to create inferences about their interaction partners, such as the partner's physical attractiveness and tone of voice (Danet, 1998).

Some writers have proposed that the lack of nonverbal and paralinguistic cues can reduce the quality and effectiveness of CMC interactions (Culnan & Markus, 1987). Other writers take an evolutionary perspective, arguing that people are less skilled at interpreting written text because their ability to communicate specifically evolved for face-to-face communication (Baumeister & Leary, 1995). These claims raise an important question: In the absence of face-to-face communication, is CMC still sufficient to enable pairs of strangers to understand each other?

To assess how—and how well—interaction partners come to understand each other through CMC, we must first consider how interaction partners manage to do this in a face-to-face interaction. Many writers have argued that interaction partners rely heavily on language to develop a "common-ground understanding" (Abbeduto et al., 1998; Kecskes & Zhang, 2009) or an "intersubjective meaning context" (Morganti, 2008). In general, these writers agree that an important first step in the development of a "common-ground understanding" is the interaction partners synchronizing their language use so that they can use the same words in essentially the same way (i.e., with the same intended meanings). This synchronization—the extent to which two people use the same words in essentially the same way—has been assessed with the latent semantic similarity (LSS) index in previous studies of initial face-to-face interactions (Babcock, Ta, & Ickes, 2014; Ta, Babcock, & Ickes, 2017).

However, to the best of our knowledge, no previous studies have examined the extent to which two people use the same words in essentially the same way in CMC, nor have any studies examined the impact of potential moderator variables (such as personality and sex) in this regard. For this reason, in the present study we sought to investigate the development of LSS and the role of personality and sex in initial dyadic CMC.

Establishing mutual understanding is a crucial factor in any interaction because it allows individuals to effectively communicate with one another. It is also important to the development and maintenance of various types of relationships, including successful informational exchanges between strangers, maintaining friendly and cooperative relations between acquaintances and co-workers, and sustaining mutual understanding and trust between intimate partners. On the other hand, there is evidence that failures in mutual understanding can lead to interpersonal conflicts unless they are recognized and corrected (Koerner & Fitzpatrick, 2016).

Because CMC has become a ubiquitous form of communication, it is important for researchers to examine both the development of LSS in CMC and how this process is influenced by personal characteristics such as personality and gender—— characteristics that have been shown to influence the course of CMC discussions (e.g., Blau & Barack, 2012).

BACKGROUND

Latent Semantic Similarity

LSS is assessed using Latent Semantic Analysis (LSA), an automated statistical method that establishes the contextual meaning of any text by analyzing the relationship among the words that are used (Landauer et al., 1998). Among other applications, LSA can be used to compare two blocks of text and assess the degree of their LSS, i.e., the degree to which the same words are used in the same way in both blocks of text.

Depending on whether a word does or does not appear within a corpus in various contexts, the LSA program combines the contexts in which a word is used and then implements a set of rules that determines the similarity of meanings of words and groups of words. After selecting one of the options in Landauer's online software program, the LSA Pairwise Comparison program (Laham et al., 1998, http://lsa.colorado.edu), the user is prompted to input two blocks of texts into the program's high-dimensional semantic space in which computations can be made using up to 150 dimensions. The

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