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To email or not to email: The impact of media on psychophysiological responses and emotional content in utilitarian and romantic communication

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ABSTRACT

Lean asynchronous computer mediated communication is often considered poor for communicating emotion, yet individuals continue to use it for business, personal, and even romantic communication. We used a lab experiment to investigate the influence of media (email and voicemail) and task type (romantic and utilitarian) on both the psychophysiological responses of senders and the content of the resulting messages. Message senders had more arousing physiological responses when sending emails than when leaving voicemails. An interaction exists between media and task such that the content of romantic email messages was more positive than romantic voicemails; while the opposite was true for utilitarian tasks. Thus the choice of media triggers different emotional responses in the sender and leads to different message content.

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1. Introduction

Communication media such as email and voicemail have become ubiquitous in work and in personal life because they enable individuals to correspond asynchronously. Whether due to limitations of the technology (e.g., the inability to convey vocal tone) or cultural norms, some media are considered less appropriate for some types of communication (Kock, 2004; Sussman & Sproull, 1999). For example, email and text chat are considered poor for communicating emotion (Byron, 2008; Hancock, Landrigan, & Silver, 2007) because they may increase interpersonal conflict (Polites & Karahanna, 2013), yet other research shows they are suitable for building interpersonal relationships (Walther, 1996).

Despite the widespread use of media for work and personal communication, little is known about how the characteristics of various media lead to emotional responses among users or how they distort communication messages for work and personal tasks. In dyadic communication between two parties, message senders

and receivers play different roles and may be influenced by the media differently during the communication process. In this study, we limit our examination to the individual composing and sending the message to understand how the media influences senders and the messages they compose. Specifically, our goal is to examine the effects of media use for two different types of tasks (a utilitarian work task and a personal romantic task) on 1) the senders' emotional responses and 2) the messages composed. We use psychophysiological measures because they enable us to examine emotional responses in real time without interrupting the user (Riedl et al., 2010).

2. Theory and prior research

Researchers often classify media along the theoretical dimensions of richness (Daft, Lengel, & Trevino, 1987), synchronicity (Dennis, Fuller, & Valacich, 2008), social presence (Short, Williams, & Christie, 1976), and naturalness (Kock, 2009) so that an individual medium can be differentiated from the diversity of available media. A medium's richness is its ability to change understanding in the recipient by conveying a variety of cues, enabling feedback, and transmitting language variety (Daft et al., 1987). A medium high in synchronicity enables users to work together in a synchronized

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pattern of collaboration (Dennis et al., 2008). Media high in social presence provide the impression of intimacy towards a communication partner (Short et al., 1976). Natural media are those closest to face-to-face (FtF) and emphasize vocal communication, facial expressions, and synchronicity (Kock, 2005b). Researchers have advanced theories using these dimensions to explain individual behavior with various media. While media richness theory (MRT) (Daft et al., 1987), media synchronicity theory (MST) (Dennis et al., 2008), and social presence theory (SPT) (Short et al., 1976) inform our research, we primarily draw upon media naturalness theory (MNT) (Kock, 2004, 2005b, 2009).

2.1. Media naturalness theory

MRT uses evolutionary biology to explain how the traits and abilities humans use to understand vocal and non-verbal communication were naturally selected over time (Cuthbert et al., 2003; Kock, 2009). MNT posits that users of less natural media will be required to expend greater cognitive effort to complete tasks (Kock, 2005b). Under MNT, a medium's naturalness is an indication of its similarity to FtF communication along several important dimensions (Kock, 2005b). Natural media offer the perception of co-location, provide synchronicity in interaction, and allow for the conveyance and interpretation of facial expressions, body language, and speech (Kock, 2004) with a particular emphasis on vocal communication (called the speech imperative proposition) (Kock, 2004). For example, videoconferencing is considered a natural media because it can convey vocal cues (e.g., tone, pace, and volume) and visual cues (e.g., body posture and gestures) synchronously much like FtF communication (Kock, 2005b). Email primarily transfers textual cues and is typically used asynchronously. Even when users add formatting or emoticons to messages (Skovholt, Grønning, & Kankaanranta, 2014), email lacks the variety of cues found in FtF communication and is considered less natural. Voicemail is ranked between email and videoconferencing in naturalness because it is used for asynchronous communication, but conveys vocal cues (Kock, 2004).

We chose email and voicemail because they are ubiquitous in business and social communication (Clare & Ketelaar, 1997) and because they allow us to examine how media that differ in naturalness influence senders and the messages they compose (Kock, 2007). The two media are similar on some dimensions of media naturalness but differ in their capability to convey vocal cues (Dennis et al., 2008; Lang & Bradley, 2010). These differences allow us to theoretically examine how different media influence emotional communication.

2.2. Emotion and emotional communication

Individual emotion has emerged as an important theoretical construct for researchers seeking to understand the use of information technologies (Adelaar, Chang, Lancendorfer, Lee, & Morimoto, 2003; Hudlicka, 2003; Stieglitz & Dang-Xuan, 2013; Venkatesh, 2000; Yin, Bond, & Zhang, 2014). In this study, we use the two-dimensional model of emotion (Potter & Bolls, 2012), where, instead of considering discrete emotions such as anger, sadness, or happiness, or joy, emotion is conceptualized and measured along the dimensions of arousal and valence (Bradley & Lang, 2000; Cacioppo, Petty, Losch, & Kim, 1986). Emotional arousal is the magnitude of the affective response, and valence is the positive or negative direction of that response. Under this model, the emotion happiness is characterized by moderate arousal and positive valence while anger is characterized by moderate to high arousal and negative valence. These emotional responses can be evaluated consciously or may also be subconscious—influencing an

individual without his or her knowledge (Dennis, Minas, & Bhagwatwar, 2013).

Less natural media have been deemed by some as inappropriate or unsuitable for emotional communication (Byron, 2008; Kruger, Epley, Parker, & Ng, 2005). However, these media may not be as poor in communicating emotion in practice as once thought (Hancock et al., 2007); less natural media may be preferred when sending messages with negative emotion, such as bad news (Sussman & Sproull, 1999). People using unnatural communication media can convey and recognize emotion and develop interpersonal relationships (Derks, Fischer, & Bos, 2008; Hancock et al., 2007; Hian, Chuan, Trevor, & Detenber, 2004).

We examine the composing of individual messages which may comprise part of a larger overall task. These *communication tasks* are our unit of analysis, and we are interested in how different types of communication tasks may influence the sender's emotional response and the content of the messages composed. Different types of communication tasks have different emotional components. In this study, we consider communication tasks that are utilitarian in nature and communication tasks that are romantic. Utilitarian communication tasks are those which are focused on completing a larger task and are not addressed to a romantic partner. The tasks themselves typically have little positive or negative emotional content. With romantic communication, a sender composes messages addressed to his or her partner or romantic interest which often include flirtatious language and tone. The goal of a utilitarian message is to communicate information or coordinate behavior. In contrast, the goal of a romantic message is to increase the emotional connection between communicators.

Researchers have typically studied utilitarian communication tasks so research on media use in romantic communication is limited. High levels of cell phone use have been linked to romantic relationship satisfaction (Miller-Ott, Kelly, & Duran, 2012) and romantic vocal communication using a phone similarly strengthens couples' relationships by increasing love and commitment. The content of messages between friends differs from messages between romantic partners (Johnson, Haigh, Becker, Craig, & Wigley, 2008); however, using text messaging may impair relationships (Pizzagalli, 2007). Even with these studies, it remains unclear how the use of different media influences emotional communication.

2.3. Hypotheses

Our research model is presented in Fig. 1. First, we examine how the use of different media triggers emotional responses in the sender. Second, we examine how the use of different media influences the content of composed messages. Finally, we investigate how these relationships are moderated by communication task type.

MNT proposes that communication outcomes are influenced by the naturalness of the chosen communication media (Kock, 2005b, 2007; Vlahovic, Roberts, & Dunbar, 2012). When humans use a less natural medium, its limitations will make communicating less satisfying than using more natural media, even after senders learn to use the medium effectively (Kock, 2005b). In the case of email, senders consciously or subconsciously become frustrated at the medium's inability to convey vocal tone or other non-verbal cues and expend greater cognitive effort to overcome email's shortcomings, which causes negative responses (Kock, 2004). Though a medium may have advantages (e.g., long-distance communication), its unnaturalness will be unpleasant to senders. Users of less natural media will experience more negative emotional responses when composing messages compared with using more natural media.

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