



## Anger and happiness in virtual teams: Emotional influences of text and behavior on others' affect in the absence of non-verbal cues

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### ABSTRACT

Emotions carry social influence, as evident by emotion contagion – an unconscious process attributed to mimicking of non-verbal cues. We investigate whether emotion contagion can occur in virtual teams; specifically, the emotional influence of text-based and behavior-based cues on participants' emotion in 4-person virtual teams. In a  $2 \times 2$  design a confederate textually communicated anger or happiness, while behaving in a resolute or flexible pattern. The team task required negotiation offering a performance based reward. We demonstrate that emotion contagion occurs in teams even when communication is only text-based. We show that behaviors are perceived as emotionally charged, resolute behavior interpreted as a display of anger, and flexibility as a display of happiness. Moreover, we demonstrate that incongruence between text-based communication of emotion and emotionally charged behaviors elicits negative emotion in fellow teammates. Our findings extend the boundaries of emotion contagion and carry implications for understanding emotion dynamics in virtual teams.

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### Introduction

Emotions are known to have social influence in domains such as leadership, negotiation, and conflict (e.g., Parkinson, 1996; Van Kleef, 2009). One way in which this influence occurs is through the phenomenon of emotion contagion – a powerful and fundamentally unconscious process (Hatfield, Cacioppo, & Rapson, 1992; Neumann & Strack, 2000) commonly attributed to automatic mimicking of non-verbal cues (e.g., Hatfield et al., 1992; Totterdell, 2000). Emotion contagion has been documented in individual and group interactions (e.g., Barsade, 2002; Neumann & Strack, 2000; Pugh, 2001), but the boundaries within which it is likely to occur are unclear.

Our broad research question deals with the dynamics of emotional influence in the absence of non-verbal cues. Specifically, we address three related questions: (1) Can emotion contagion occur when communication is only text-based? (2) Do individuals interacting in mediums with limited non-verbal cues interpret behaviors of others as conveying emotional cues? (3) Can emotional effects of behaviors change the effects of direct, text-based communication of emotion? All of our analyses deal with dynamics

in teams, where people work together on a team goal and depend on others for both individual and team performance.

Below, we first briefly discuss the meaning of emotion as operationalized within this paper, and the ways in which it both differs from and overlaps with the related concepts of affect and mood. We follow this with an overview of what the literature can tell us about emotion contagion in text-based (rather than face-to-face) communication. Next, we suggest that emotion can be communicated through both language and behaviors that are emotionally charged, and we consider what happens when there is incongruence between emotions communicated through text and through behavior. We then present a test of our predictions using an experimental simulation of virtual teams. We show that anger and happiness can be transferred to others through emotion contagion even in text-based communication. We further show that resoluteness and flexibility are read as expressions of anger and happiness, and that incongruence between language and these emotionally charged behaviors evokes negative emotions in team members.

### What is an emotion (in text-based communication)?

The classic question posed by William James (1884), “What is an emotion?”, is especially complicated when emotions are considered

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as social entities (Hareli & Rafaeli, 2008; Parkinson, 2005), and even more so in the context of text-based communication (Parkinson, 2008). We take as a point of departure for our analysis Schwarz and Clore's (1996) definition of emotion – namely, a feeling that arises “in response to ongoing, implicit appraisals of situations with respect to positive or negative implications for one's goals and concerns... [Emotions] have an identifiable referent (what the emotion is ‘about’), a sharp rise time, limited duration, and often high intensity” (p. 385). As thus conceived, emotions are distinct from moods, which are more diffuse feelings that may not be linked to a specific cause (Elfenbein, 2007; Schwarz & Clore, 1996). Moods are typically of relatively low intensity and tend to last longer than emotions. Moods may sometimes arise as after-effects of emotion – faded emotions whose initial cause is no longer salient (e.g., Cropanzano, Weiss, Hale, & Reb, 2003; Schwarz, 1990).

While the distinction between emotion and mood is useful at the individual level, in the context of teamwork this difference may be blurred. That is, the processes at work in team dynamics, including emotion contagion, mean that one person's discrete emotion may shape another person's mood; this mood is likely to be broad and unfocused, with no awareness of causality. Put differently, contagion suggests a process that starts with one person's specific emotion, and continues with an unconscious spread of emotion that lacks a clear cause, so what emerges is a more vague and undefined mood. For this reason, some scholars (e.g., Neumann & Strack, 2000) prefer the term “mood contagion” to “emotion contagion”. In the current paper we will use “emotion” as a general rule, but will sometimes refer to “mood” when more diffuse, group-level feelings are under discussion.

In studying emotion dynamics in teams, our analysis integrates research on emotion with research on groups and teams. In addition to the transfer of feeling from one agent to another (Hareli & Rafaeli, 2008) – or, expressed differently, from one agent's emotion to another agent's mood – we must also consider the relationship between individual emotion and team-level emotion. However, since our focus is on emotion dynamics in *virtual* teams, we first consider the unique dynamics of text-based and computer-mediated communication of emotion.

### Emotion contagion in text-based communication

Members of teams – virtual or not – must recognize and deal with feelings in the course of their work. These feelings may then expand beyond the boundaries of the individual through the unconscious process of emotion contagion (Barsade, 2002), making emotion a property of the team (Kelly & Barsade, 2001). As described above, non-verbal cues are thought to be key to the communication of emotion (Mehrabian, 1972; Sullins, 1991), and emotion contagion (or mood contagion) is believed to arise through the mimicking of such non-verbal cues (Barsade, 2002; Hatfield, Cacioppo, & Rapson, 1993; Neumann & Strack, 2000). But when team communication relies on electronic media, and is therefore primarily text-based, non-verbal cues are limited, which raises the question of whether mimicking and contagion can occur.

This question is important because modern teamwork, more often than not, relies on text-based communication (Malone, 2004; Staples & Webster, 2008). As noted by Short, Williams, and Christie (1976) and DeSanctis and Poole (1994), social interactions are drastically different when they rely on electronic rather than face-to-face communication. Research has begun to shed light on how technology affects interactions and performance in the workplace, including team-based encounters, yet rarely have emotions been studied at this context (Fineman, Maitlis, & Panteli, 2007). Studies have shown, for example, that the interplay between technology and social interaction can be adaptive (DeSanctis & Poole,

1994), so that groups whose communication is electronically mediated are marked by greater participation and more extreme, original and risky decisions (Kiesler & Sproull, 1992). However, whether and how emotion dynamics plays out in teams that can rely only on text-based communication is yet to be fully understood.

Daft and Lengel's (1986) analysis of “media richness” identifies text-based communication as a “poor” form of communication, meaning that nuances conveyed through text-based communication can easily be misinterpreted or misunderstood. This suggests that emotion conveyed in this way is unlikely to result in social influence or emotion contagion.

The relative poverty of text-based communication as suggested by Daft and Lengel (1986) is apparent in Byron and Baldridge's (2005) findings. They showed that emotions could be detected in email, but that different readers interpreted the same texts as expressing different emotions. For instance, the length of an email message suggested different things to different people: some participants interpreted a long message as suggesting positive emotion, and others negative emotion. Even emoticons (☺, ☹ and their offshoots), which appear to offer a substitute for facial expressions, can be confusing and can lead to inaccurate interpretations (Walther & Addario, 2001). Moreover, senders have control over the cues they use to convey emotions in textual communication, such as capital letters, emoticons, or message length (Byron, 2008). In contrast, in face-to-face communication expressions of emotion tend to be automatic, spontaneous, and hard to control, and are therefore presumed to be authentic (Ekman, 2009; Ekman, Friesen, & Scherer, 1976). The fact that recipients may doubt the authenticity of emotions conveyed in text-based media raises further questions about the social influence of such emotions, given that more authentic expressions can be expected to be more influential.

Byron (2008) noted two systematic biases in people's reading of the emotion conveyed in email messages: a *neutrality bias*, whereby people fail to recognize positive emotions and evaluate them as neutral; and a *negativity bias*, whereby people attribute greater intensity to negative emotions. Byron (2008) also found that people appear to be unaware of these biases. Other studies support the presence of a negativity bias, including Walther and Addario's (2001) finding that negative cues overrode other cues in computer-mediated communication, and Kramer's (1995) finding that people tend to attribute sinister intentions to partners in negotiations using electronic media. At the same time, Kruger and colleagues (Kruger, Epley, Parker, & Ng, 2005) showed in a series of studies that senders typically overestimate their ability to convey anger and other emotions in email messages.

Notwithstanding the problems inherent in text-based communication, there is some evidence that people can accurately detect emotion from computer-mediated communication, and that such emotion can be contagious. Hancock and colleagues (Hancock, Gee, Cicaccio, & Lin, 2008) found that partners in a dyadic interaction who were induced to feel negative emotion wrote shorter messages, used more negative terms and exchanged messages at a slower rate than those induced to feel neutral emotion. These text-based communications of emotion were detected and “caught” by partners interacting via text-based instant messaging.

The recognition of emotion in text-based communication is also evident in the phenomenon of flaming. *Flaming* is an online attack typically involving profanity, obscenity, and insults intended to offend people or organizations (Reinig, Briggs, & Nunamaker, 1997). Flaming often occurs in the context of Internet forums, chat rooms, or social networking sites, where hostile communications can be seen by many people, and may spread quickly. The idea of a rapid spread of negative emotion through a social network clearly resonates of emotion contagion. Johnson, Cooper, and Chin (2009) attributed flaming to a sense of anger arising from perceived unfairness or maltreatment in text-based communication, where

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