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Personality, Emotion and Judgment in Virtual Environments: A Theoretical Framework

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ABSTRACT

As organizations become increasingly reliant on distributive technologies, the processes that underpin the effective functioning of employees in virtual environments require systematic examination. This article provides a theoretical framework for studying personality, emotion and judgment in virtual environments. The communication media characteristics, social context, and individual traits and states are presented to portray the dynamic nature of judgment formation in a virtual environment. We argue that media characteristics, combined with personality, motivation and emergent social contexts serve to shape emotions and resultant judgments. By integrating the Information Systems (IS) and Organizational Behavior/Psychology literatures, we chart a course for research examining personality, emotion and judgments, with implications for any distributed organization. [Article copies are available for purchase from InfoSci-on-Demand.com]

Keywords: Communication; Emotion; Judgment; Personality; Virtual

INTRODUCTION

The global business environment poses many challenges and opportunities for organizations seeking to capitalize on human talent. It is now possible to work in a virtual

environment, where co-workers are scattered across the globe. Virtual workers make important judgments that are informed by emotions, communication cues and norms different from those in face to face (FtF) interaction (Walther et al., 2005). While

few would quibble about the importance of timely and effective decision making in a fast paced, global business environment, little research attention has been paid to the role of personality, emotions and judgments in virtual environments. This article argues that by understanding judgments, and the processes that underlie their creation, organizations may be in a better position to help ensure decisions made in virtual environments are in the firm's best interest.

This article uses well established theories from the Information Systems (IS) and Organizational Behavior/Psychology literatures to develop theoretically grounded propositions that examine the complex interplay between personality traits, state emotions, motivational systems, social context and media characteristics. At the heart of this examination is the desire to understand why certain people may experience the same objective information in very different ways, and how that may lead to subsequent differences in judgments about the encoding, sending and decoding (interpreting) of electronic messages. We believe that the primary contribution of this article is a theoretical framework and related set of propositions that use well established theories from the computer mediated communication (CMC) and psychology literatures to frame the field of inquiry into personality, emotion and judgments in virtual environments.

The geographic distribution of organizational members has resulted in the concepts of virtual work and virtual teams. A virtual team possesses all the qualities of a collocated team (task interdependence, common goals), but is geographically distributed and uses communication technology as the primary vehicle of coordination (Gibson & Cohen, 2003; Lipnack &

Stamps, 1997). Virtuality can be considered as a continuum (Leenders et al., 2003) between completely co-located members who coordinate exclusively through FtF interactions (i.e., not at all virtual) to individual members who coordinate without ever meeting in person (i.e., completely virtual). When operating at, or near, the high end of the virtuality continuum, both senders and receivers of electronic communication have less information about remote workers, their actions, their experiences, their situations and context than if working in a collocated team (Cramton, 2001). In addition, both senders and receivers have information that is of lower quality than in collocated teams (Cramton, 2001) and there will be fewer established operating norms to guide behavior. When making judgments, communicators will fill in the informational and normative gaps and the manner in which they do so will be heavily influenced by individual differences including personality, motivation, and emotion. Because of the increased uncertainty, lower quality of information, and fewer norms associated with the CMC environment, it follows that individual differences may play stronger and different roles in influencing judgment formation than in collocated environments.

A wide variety of communication technologies are currently available to support virtual work including email, instant messaging, video conferencing, teleconferencing, groupware and decision support systems (Rice, 1993). Following many prominent Information Systems and Communications scholars (e.g., Hancock, 2004; Jarvenpaa & Leidner, 1999; Ngwenyama & Lee, 1997; Panteli, 2002; Pauleen, 2003; Ramirez et al., 2002; Walther et al., 2005; Yoo & Alavi, 2004), this article focuses on text based CMC such as email and instant

messaging, due to its overall pervasiveness and continued importance in operationalizing virtual work (e.g., Kraut et al., 1999; Walther, 2004). For the remainder of the article, the acronym CMC will be synonymous with 'text-based CMC'.

The article first discusses and compares CMC and FtF communication media characteristics. That is followed by an examination of social context and norms within virtual environments. Personality traits, including the motivation and emotive processes that underlie them, will be examined in relation to their ability to influence emotion states and judgments. Finally, we develop a theoretical framework and set of propositions to guide the exciting field of personality, emotion and judgments in virtual environments by integrating the characteristics of CMC with individual differences.

COMMUNICATION MEDIA CHARACTERISTICS

Media Richness Theory (MRT; Daft & Lengel, 1986; Daft et al., 1987) was derived to predict the selection of a media based on the ambiguity, equivocality or uncertainty of the message being sent. MRT also suggested that communication would improve the process of creating and changing understanding if an appropriate (i.e., rich) channel were selected to send the message. Studies which tested MRT (e.g., Dennis & Kinney, 1998; Markus, 1994) indicated that media channel characteristics alone are not ideal predictors of channel selection or performance. Over time, our understanding of media selection and channel richness has evolved. It has been noted that media users often adapt to the constraints of a

medium over time (Ramirez et al., 2002; Tidwell & Walther, 2002; Walther et al., 2005; Walther & Burgoon, 1992) and that media is but one aspect which influences communicators' patterns of interaction (Zack & McKenney, 1995) and resulting effectiveness of communication (Lee, 1994; Ngwenyama & Lee, 1997; Rice, 1993). While certain media characteristics are relatively enduring, the effects of others are moderated by non-media factors, such as experience with communication co-participants, experience with the media, organizational or social context, discussion topic (Carlson & Zmud, 1999), and gender of the communicators (Dennis et al., 1999). One evolving theory is Social Information Processing (SIP; Ramirez et al., 2002; Walther & Burgoon, 1992), which posits that media users adapt to the available cues to convey and interpret information, especially of a socio-emotional nature, normally transmitted via alternate channels. Guided by this premise, we present six media characteristics as the basis of delineation between interaction patterns in CMC and FtF environments.

Table 1 presents differences between CMC and FtF communication based on media characteristics, along six continuums pertinent to the study of judgment formation: synchronicity; presence; reach; symbol variety; rehearsability; and reprocessability.

Synchronicity

Synchronicity refers to the overall ability of communicators to time their message and feedback delivery (Carlson et al., 2004). In FtF interaction, a communicator may receive feedback from their audience at any point, including while they are communicating. Such feedback can take the form of

Table 1. CMC vs. FtF media characteristics

	Face to Face (FtF)	Computer Mediated Communication (CMC)
Synchronicity	Instantaneous/Concurrent Feedback	Asynchronous Low to high time lapses
Presence	High physical presence Low to High psychological presence	Low physical presence Low to high psychological presence
Reach	Low	Typically high
Symbol Variety	Multiple channels Multiple cues	Single channel Multiple cues
Rehearsability	Situation dependant Typically low	Situation dependant Typically high
Reprocessability	Low	Typically high

co-communicators speaking in turn, as well as visible cues such as gesture, stance, or facial expression (Reilly & Siebert, 2003). Overall, synchronicity uses FtF interaction as a benchmark, in that no other channel is more synchronous. In CMC, the message sender has limited control over when a message will be read by its intended receiver, although the sender can be relatively certain when the message is sent. Synchronicity can still be fairly high in the case of instant messaging and email users who are quick to reply, but feedback can never be concurrent. Overall, CMC technology enables asynchronous communication, although norms of feedback immediacy can reduce the latency of replies. Synchronicity of FtF interaction allows communicators to tailor their messages to their perceptions of their communication co-participants' affective states.

Presence

Highly related to synchronicity is the concept of presence. Presence refers to the state of being immediately available

and has been explored in various conceptions in the IS literature (Hakkinen, 2004; Maruping & Agarwal, 2004; Mikropoulos & Strouboulis, 2004; Panteli, 2004; Wilson, 2003). A FtF environment, by definition, enables high presence. However, even though an individual is physically present, they may have low psychological presence which would be actualized as a general disengagement toward integrating and connecting with other individuals, and a lack of focus on their performance (Kahn, 1992). Virtual environments such as email lack physical presence but psychological presence is highly achievable. That is, a virtual worker can be in a state where they are exhibiting personally engaging behavior consistent with their role expectations. If one is available for work, and responds to inquiries in a manner consistent with group norms, then they would be considered present in the virtual environment. Panteli (2004) recently articulated three forms of presence in virtual work. The first, present availability, means a virtual worker is available online and has the time to perform the desired task. The second,

absent unavailability, refers to a person who is absent from the virtual environment as well as being unable to work on the project at hand (for example, a person on vacation would be 'absent unavailable'). The third articulation, silenced availability, refers to individuals who are expected to be available to work but remain silent. For the purpose of this article, presence in a CMC environment means that a virtual worker is available and able to partake in necessary tasks (consistent with Panteli's 'present availability' articulation).

Reach

A medium high in reach allows communicators to send message(s) to large numbers of recipients who may be physically and temporally distributed. This is similar to the oft cited media characteristic of parallelism which refers to the number of simultaneous communication threads that can be effectively maintained (Dennis and Valacich, 1999). FtF communication is low in reach, as message dissemination is limited to participants who are in one another's immediate physical proximity. In contrast, some forms of CMC (such as email) have high reach as they enable the simultaneous sending of a message to thousands of recipients who may be globally distributed. The most extreme uses of reach include viral marketing efforts where the ability to influence is increased significantly through electronic networks (Subramani & Rajagopalan, 2003). Often times the use of cc'ing and bcc'ing in email (a form of reach) is used as a defence mechanism against potentially damaging situations. This behavior contributes to email overload and associated time management issues for managers. For the purposes of this manuscript we are interested in the

judgment CMC participants make regarding the perceived reach intention of sent messages.

Symbol Variety

Symbol variety refers to the number of channels and cues available in a given media through which a message may be communicated (Dennis & Valacich, 1999). In FtF interaction, communication can occur via auditory or visual channels. Speech is produced and delivered via the auditory channel and contains multiple cues which influence message interpretations. These cues are divided into linguistic (referring to language) and paralinguistic (vocal prosody) (Reilly & Siebert, 2003; Russell et al., 2003; Scherer, 2003). Such cues are often accompanied by further paralinguistic cues, delivered via visual channels, such as gesturing, body stance and facial expressions. Paralinguistic cues are thought to be highly associated with the communication of affective information (Borod et al., 2000). This may result in the formation of judgments in the absence of language, and these judgments may form more quickly than if they relied solely on linguistic cues. In CMC only one channel is available, but both linguistic and paralinguistic cues can be communicated (Boonthanom, 2004). Paralinguistic cues in text messaging may be delivered using punctuation, capitalization, word spacing and emoticons and these may be substituted for verbal cues available in FtF (Sia et al., 2002). There is an active debate regarding whether paralinguistic cues in text messages are comparable (to FtF) conveyors of affectivity. To study the effectiveness of text based paralinguistic cues, and the process of judgment formation, researchers must consider the norms surrounding such cues

within a given context, as it is probable that there will exist far fewer universally accepted paralinguistic cues in CMC than in FtF expressions of emotion.

Rehearsability

A medium high in rehearsability enables a message sender to carefully formulate a message (Dennis & Valacich, 1999). In FtF interaction, individuals may rehearse in anticipation of an upcoming communication event. However, this does not likely make up the majority of FtF interaction. In the process of delivering a rehearsed speech, the communicator may alter their message, its delivery, or both, dependent on perceived feedback from their audience. While rehearsal is possible, most FtF interaction in day-to-day encounters is unrehearsed. Conversely, CMC allows communicators to formulate and reformulate their entire message before recipients are even aware of it, using any amount of time they choose. In certain situations, CMC communicators are constrained by synchronicity norms so that they are unable to rehearse their messages to the extent they might prefer. Nonetheless, rehearsability is clearly a more salient attribute of CMC than of FtF interaction. Outside of social norms, the amount of time and effort spent in formulating a message is largely a matter of personal choice. Personality traits, therefore, may predict the extent of rehearsal performed. In rehearsing a message, a communicator may make several judgments about how the intended recipient may interpret and use the information, and what sort of affect might be elicited. The message sender then has the opportunity to alter the message to increase the probability that mutual understanding will occur. If rehearsal is conducive to creating improved understanding (which

requires empirical testing), this CMC attribute provides an avenue for richness which is largely unavailable in FtF interaction.

Reprocessability

Reprocessability is the extent to which a medium enables communicators to revisit messages sent and received in the past (Dennis & Valacich, 1999). Once a FtF interaction has occurred, it is not possible for communicators to revisit the encounter in detail. While communicators may attempt to recall what was said in such encounters, their recollection is unavoidably influenced by recall biases. In CMC, a copy of the message can be retained and referred to an infinite number of times. As long as the user does not delete their messages, CMC is highly reprocessable. The various outcomes of message reprocessing provide interesting topics for research. For example, affective responses to a particular email upon initial processing may influence those elicited upon subsequent occasions. It also remains unclear whether and how revisiting email influences judgment formation or revision.

SOCIAL CONTEXT AND NORMS

Following the current conception of CMC users as social actors (Lamb & Kling, 2003), we highlight the role of social context (e.g., group norms) in shaping CMC interaction and appropriation. While social context influences CMC interactions, it is also defined and reshaped by those interactions (Fulk, 1993), and thus can be considered both the medium and the outcome of the interaction (Zack & McKenney, 1995). Social context plays a role in interpreting

electronic messages and shaping subsequent responses (Garrety et al., 2003; Spears & Lea, 1994), and its importance in communication may be higher in CMC than in FtF communication (DeSanctis & Monge, 1999). Zack and McKenney (1995) provide one of few empirical studies to examine the influence of social context on CMC. They found that two groups with the same functional structure, performing the same task and using the same technology, but within different social contexts, appropriated CMC differently. It was the normative differences around cooperation and communication openness that distinguished the two social contexts and thus influenced the different appropriations. It is our view that within a social context, it is the normative expectations about what 'ought to happen' (McGrath, 1984) that are critical to studying judgments of individual group members (Graham, 2003) through a process of norm formation, adherence and violation within virtual environments.

Norms influence how group members interpret, feel, judge, and behave relative to one's group or situation (Sherif, 1935). They reflect the influence of both the group as an entity and the individual members of the group and can contribute to variances in how electronic media is used. Our conception of virtual work norms can be framed based on expectations about certain media characteristics (for example, synchronicity), message content (comprehensiveness of the message, the amount of task related versus socio-emotional content, the level of formality of the message, and the degree of affectivity in the message), presence, degree of openness, and workload.

When norms are first established they are typically generalized where the boundaries of the norm are fuzzy and can be misunderstood and misinterpreted (Graham,

2003) and subsequently result in judgments that can lead to bad first impressions and conflict. For example, a group norm may exist that specifies that responses to email requests (synchronicity) are completed in a timely fashion. A 'timely fashion' could mean different things to different group members, depending on their past work experience and associated context. When misinterpretations are made explicit, and shared understanding emerges, the norms become operationalized and the boundaries are made clearer, making further misinterpretation less likely.

Norm formation in CMC is an emergent process (Ghosh et al. 2004; Postmes et al., 2000) and norms may take longer to form when virtual group participants have no shared history, and are working on ill-structured tasks (Bettenhausen & Murnighan, 1985). These characteristics are typical of many dynamic, ad-hoc and special work teams in CMC environments. For example, global virtual members may bring unique cultural backgrounds, work experience and expertise and rely on this backdrop to determine appropriate communicative behavior when placed in situations of uncertainty (Bettenhausen & Murnighan, 1985). If the behavior is consistent with an existing norm, the norm will be reinforced and strengthened. However, if the behavior violates a norm, the norm will be weakened unless the group sanctions the behavior in an appropriate manner (Graham, 2003). Norm violation can result in conflict, which, if it reaches a manifest state (Pondy, 1967), can act as an initiator to further norm formation.

THEORETICAL FRAMEWORK AND PROPOSITIONS

This section describes some of the trait, affective, and cognitive processes that may contribute to judgments in virtual environments. Enduring characteristics, such as personality traits, interact with state emotion and cognition, and the social context to form judgments. The social context in which communication occurs consists of emergent attributes such as norms surrounding media characteristics and message content. When communicating electronically, members of virtual work structures make judgments about other group members, the group itself, task objectives, the team's social context, and the technology that mediates their communication (amongst others). These judgments may influence what team members' choose to encode in their electronic messages, and how they decode and interpret subsequent messages.

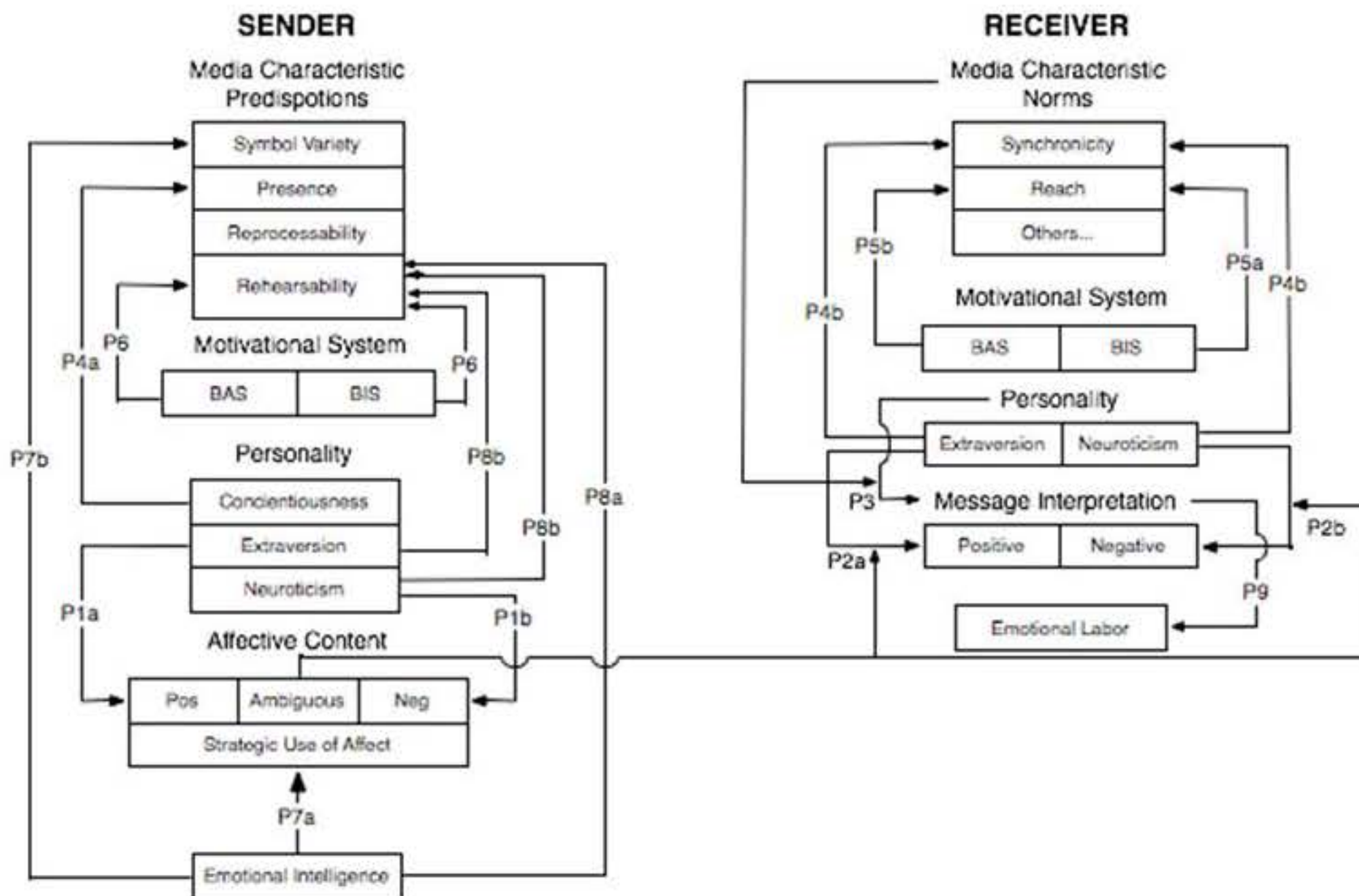
Consider a distributed global software development team that is using CMC to communicate. The existing social norms of the team dictate that electronic communication is professional and respectful (reflected through message content norms), and the expected work hours of the team are reasonable (reflected through synchronicity and presence norms). The project leader is under intense pressure from a client to ensure that a major deliverable is met, and is also starting messy divorce proceedings with her long-term spouse. The leader sends out an inflammatory email to the team, using language that violates content norms, stating that expectations are not being met, that hours of work will be increased, and that the team is not performing adequately. In encoding this message, the leader is violating the existing norms of the team,

and is encoding anger into the text of the email (intentionally or not). Upon receipt and decoding of the email, a team member may judge the sender to be angry, which contributes to the dynamic social context within which the team will continue to operate. However, personality predispositions are likely to result in different judgments regarding the same situation.

Figure 1 presents a theoretical framework for exploring the role of personality, emotion, and judgment formation in virtual environments. The framework considers the role of virtual workers as senders of electronic messages and as receivers of electronic messages. As senders, virtual workers will have predispositions toward judgments about media characteristics that are partially determined by their own individual differences, including their personality, motivational systems, and emotional intelligence (P4a, P6, P7b, P8a, P8b). Similarly senders' individual differences will influence the affective content encoded into electronic messages and the degree to which said content is used strategically (P1a, P1b, P7a). In receiving electronic messages, virtual workers will have normative expectations on the use of media characteristics that may moderate how the message is interpreted by the receiver (P3). When those norms are violated, virtual workers' individual differences will affect their own judgments and resulting felt emotions (P4b, P5a, P5b). Receivers' individual differences will also affect the interpretation of the content of the message (P2a, P2b), and that interpretation may lead to the performance of emotional labor (having to feign emotions) (P9).

Individual differences in personality are clearly important when considering judgments made in virtual environments. Dispositions help to describe propensities to

Figure 1. Theoretical framework



experience more frequent and intense emotion states. Emotion-related individual differences seem to include cognitive processing biases, and these processes often involve the way people use affective information in making judgments. Virtual environments provide a context to uncover patterns of relating, nuances in current theory, and the exciting possibility of uncovering new ways in which personality and emotion combine to influence cognitive judgments.

Personality and emotions help to explain why people may come to different assessments, or judgments given the same objective situation (or context). Personality refers to the stable differences (over time, and across situations) between people consisting of both cognitive and emotional aspects. The Big 5 personality traits provide a framework to understand the relatively enduring aspects of character, feeling and

thinking that differentiate individuals (McCrae & Costa, 1991), whose validity is strongly supported by empirical evidence (e.g., Digman, 1990; McCrae & Costa, 1996; O'Connor, 2002). The traits include extraversion (introversion), neuroticism (emotional stability), conscientiousness, agreeableness, and openness to experience. Extraversion is characterized by sociability, assertiveness, social dominance, ambition, tendencies toward action, sensation-seeking and the experience of positive affect. Neuroticism is characterized by excessive worry, low self-confidence, pessimism, and tendencies to experience negative affect. Conscientiousness is characterized by industriousness, perseverance, loyalty and a sense of duty. Agreeableness is associated with altruism, friendliness, and modesty, while low agreeableness includes characteristics such as antagonism, impression

management and selfishness. Openness to experience is characterized by a multiplicity of interests, receptivity to new ideas, flexibility of thought, inventiveness, and the tendency to develop idealistic goals and ideals (McCrae & Costa, 1991, 1996). We are not aware of any studies that have examined how the Big 5 personality traits help to explain emotions and judgments in virtual environments, despite intuitive links and a vast body of personality research. Extraversion and neuroticism have received the most attention (e.g., for their role in shaping our emotions and judgment processes) outside virtual environments, and thus comprise the main focus of our review.

Extraversion and neuroticism are linked to emotional and motivational systems that may be highly relevant to making judgments in virtual environments. Although propensities to experience positive and negative emotions have always been part of these traits (particularly neuroticism), personality psychologists increasingly see them as rooted in motivational and emotional systems (e.g., Carver et al., 2000). Gray's (1981; Pickering et al., 1999) seminal approach to extraversion and neuroticism illustrates the central role of motivation and emotion. Drawing on neurophysiology, he suggested these traits emerged from individual differences in the strengths of two independent motivational systems. The Behavioral Activation System (BAS) responds to conditioned cues of reward in the environment, and creates approach motivation. People who score high on extraversion have a highly sensitive BAS, and are thus highly sensitive to reward cues (e.g., the opportunity to interact with new people). In other words, the approach oriented behavior of extraverts stems from their propensity to notice and

pursue potential rewards. A second system, the Behavioral Inhibition System (BIS) monitors the environment for punishment cues and creates avoidance motivation. People who score high on neuroticism have a highly sensitive BIS, and are thus highly sensitive to punishment cues. A number of similar theories highlight individual differences in approach and motivation as central personality characteristics, likely underlying the more descriptive dimensions of extraversion and neuroticism (e.g., Carver, 2001; Cloninger, 1986; Higgins, 1997; Tellegen, 1985).

The emotional consequences of strong approach or avoidance tendencies are readily apparent; an approach orientation should create more positive emotional experience, and an avoidance motivation should create more negative emotional experience. Consistent with this suggestion, extraversion and neuroticism consistently predict positive and negative emotional experience respectively. This has been found with day-to-day emotions using experience sampling methods and with reactions to positive and negative laboratory mood inductions (Larsen & Ketelaar, 1989, 1991; Lucas & Fujita, 2000; Zelenski & Larsen, 1999). The strong interrelations among descriptive traits, motivational systems, and affective experience provide the basis for linking extraversion and neuroticism with judgments. In short, these dispositions likely influence the way people interpret ambiguous events, the likelihood and intensity of emotional reactions, and how emotion is expressed in language (Rusting, 1999); all critical to judgments in an interactive environment. However, judgments made in virtual environments have received scant empirical research attention.

Bower's (1981) network theory of affect suggests that emotions help organize

our memory. More specifically, he asserts that emotions form nodes within an associative network of information (memory). When a node is activated by emotional information in the environment and/or emotional experience, similarly valenced memories easily come to mind because they are closely related to the emotion node. These thoughts then cause judgments that are biased in an affect-congruent manner. In a virtual environment a message may trigger an emotional node (e.g., an aggressive past co-worker, or an overly demanding previous supervisor, that trigger anger) and thereby influence judgments in an affect (anger)-congruent manner. This activation of the emotion node may also persist beyond judgments of the initial trigger (i.e., the bias may carry over to future, unrelated judgments).

Combining personality's strong emotion links with Bower's network theory of affect provides a rationale for predicting personality congruent cognition (Clark & Teasdale, 1985; Rusting, 1999). That is, extraversion may predict positive judgment biases and neuroticism may predict negative judgment biases. In addition to propensities toward more intense emotions in situations, part of extraversion and neuroticism may be the cognitive structures that develop over a lifetime of positive and negative emotional experiences (Rusting, 1999). Such differences in cognitive structures could produce interpretation and judgment biases over and above momentary emotion states (Rusting & Larsen, 1998; Zelenski & Larsen, 2002). In other words, extraversion and neuroticism include more elaborated positive and negative emotion nodes respectively, and thus predict the probability of experiencing emotion, and the extent to which emotion states influence judgments.

Given the differences between FtF and virtual communication what are the ramifications for studying emotions and judgments in a virtual environment? In virtual environments the theories of personality and affect congruent judgment provide valuable theoretical insights to interpret text based communication. Due to the lack of kinetic and vocal cues, communicators in a CMC environment may rely on emotional language to express feelings, or have less information to decode an emotionally ambiguous message (although we note that this point is contested by some (e.g., Walther et al., 2005)). In CMC, it is a plausible assertion that personality will play an even greater role in encoding and decoding than in FtF communication. That is, people who experience more frequent and intense emotions may use more emotive language. The preceding discussion leads to the following propositions:

P1a: *Individuals high in extraversion are more likely to communicate positive affect than individuals who score highly in neuroticism.*

P1b: *Individuals high in neuroticism are more likely to communicate negative affect than extraverted individuals.*

Another framework popular in the affect-congruent literature is the affect as information approach (Schwarz & Clore, 1983), and it too has been extended to personality differences in judgment. According to the affect as information view, emotions can provide information that can be useful in making judgments. That is, to the extent that the emotion is perceived as relevant to the evaluation, it cues processing in an affect-congruent direction. Although affect can aid judgment, errors in the perception

of its relevance can also cause problems (consider the project leader's inflammatory e-mail, at least partially provoked by marital problems) (Schwarz & Clore, 1983). People with different traits may also view emotional information as more or less relevant to judgments (Gasper & Clore, 1998). For example, Updegraff et al. (2004) suggest that beyond the direct influence of emotional experience on satisfaction, approach oriented (i.e., high BAS) people may weigh this information more heavily when making satisfaction judgments. Using experience sampling data, they found that the (positive) relationship between positive emotional experience and satisfaction judgments was stronger for approach oriented participants. An informed understanding that personality and emotion may combine, in different ways, to influence judgments makes an examination of virtual communications a novel and exciting context for testing well established theories.

Traits like agreeableness, the tendency to get along with others, be well intentioned and be well meaning, allow for interesting debate surrounding how a stable individual difference may play out in a virtual context. One intriguing question might be, 'To what extent are people exhibiting genuinely agreeable behavior in virtual environments and to what extent are people performing emotional labor (feigning emotions consistent with socially constructed norms)'? Further, does the lack of agreeableness in virtual teams lead to constructive versus destructive conflict? Similar to extraverts' tendency to interpret ambiguous situations with a positive judgment bias, trait anger (i.e., low agreeableness) may promote a hostility bias in interpretations of ambiguous messages (Wingrove & Bond, 2005).

In CMC, affect-lean statements may leave the receiver in a position to fill any

gaps in understanding. People with a highly sensitive BIS, associated with the traits of neuroticism and negative affectivity, may be more likely to read a message looking for punishment cues. It would be interesting to examine whether employees who score high in neuroticism would interpret ambiguous (neutral) messages in a more negative fashion than those who score low (c.f., MacLeod & Cohen, 1993). Similarly, people with a highly sensitive BAS, associated with the traits of extraversion and positive affectivity, are known to scan the environment for reward cues. When interpreting ambiguous (neutral) messages, such individuals may be more likely to decode such messages in a positive fashion.

P2a: *Extraverts are more likely to interpret ambiguous text messages in a positive fashion compared to people who score highly in neuroticism.*

P2b: *Individuals who score high in neuroticism are more likely to interpret ambiguous text messages in a negative fashion compared to people who score high in extraversion.*

Now, turning our attention to messages that contain clear affective content, how might personality and social context influence the assessment of emotion laden text messages? For example, if a message was sent that read, "David you need to pick up the pace on your end of the project", persons high in neuroticism may interpret the punishment cues in the message and form a global judgment, "Oh, no! I'm going to be fired!" However, this judgment may be mediated or moderated by the norms of the social context. That is, if the people in the group know each other well, and such open discourse was a group norm, the neurotic

individual may still be more sensitive to the message, but less likely to draw grand conclusions. Similarly, individuals high in extraversion may interpret a message that reads, "David your work on the project has been exemplary", as a reward cue that might form the basis of a judgment, "I'm the strongest member of this team!" Again, if such messages were sent regularly to praise the positive contributions of group members, the extravert may still be more sensitive to the message, but the reward would be mediated or moderated by the norms of the social context. Are the social context norms the construct through which affect leads to judgment (mediation), or do the social context norms alter the relationship between personality and judgment (moderation)? We argue for moderation, as neuroscientific evidence would suggest that trait congruent cognition and affect occurs within a context (i.e., we process information *in light of* the context in which we find ourselves) (Damasio, 1994). This line of inquiry requires empirical testing and leads us to the following proposition:

P3: *The norms in virtual work groups will moderate the relationship between personality and message interpretation.*

The norms in virtual environments serve to channel behavior in a fashion consistent with the values of virtual employees, and these norms may come with different challenges than in FtF environments. For instance, while we argue that norms form over time as a product of the interaction of virtual team members, not all employees may agree with a given norm. For example, the issue of presence (being available to the virtual environment) and synchronicity (the ability to decide when and if to respond to a text based message) are two salient char-

acteristics of CMC that can lead to strong normative behavior. Some virtual teams may expect near instantaneous replies and this norm may be at odds with one or more members' personality traits. We referred to this tension when discussing the trait of conscientiousness, as a conscientious individual (or an introverted person) may desire time "away" from the virtual environment to accomplish work or home related goals. Thus, a form of trait dissonance may exist, where the personality traits of virtual team members may be at odds with the established norms.

Conscientiousness refers to the extent to which an individual is responsible, dependable, and a self-starter. In a virtual context, conscientious people may be well suited (at least from a management perspective) for virtual work as they can usually be counted on to deliver on objectives without supervision. A norm regarding presence (being available in the virtual environment) (Panteli, 2004; Rice, 1993) may, at times, be at odds with a conscientious person's need to remove themselves from a virtual discussion in order to deliver on objectives. On the other hand, to the extent that frequent communication is perceived to promote progress (and becomes normative behavior), a conscientious person may actively participate.

Expanding on the notion of synchronicity, what personality or situational characteristics might lead to an individual being more (a)synchronous in their virtual communication? Here again, we suggest that there may be a dynamic interplay between personality and social context. If the social norms of a group are to respond to all text messages as quickly as possible, persons who deviate from this norm may elicit a range of emotive reactions from their group members. Individuals high in neuroticism,

or punishment sensitivity, may be more likely to worry that excessive asynchronous behavior is a result of the 'silent' receiver's negative emotions toward the group and/or sender. That is, the level of synchronicity that runs counter to a social norm may result in negative emotions for individuals sensitive to punishment cues (as the lack of a reply runs counter to the norm and leaves the cause for the delay ambiguous). In contrast, extraverts, or those high in reward sensitivity, may interpret normative rapid responses as signalling rapid progress towards group goals (i.e., as rewarding), and respond by vigorously approaching the task at hand. Extraverts may also attribute less valence to a broken norm. A plausible exception would be when virtual groups have high task interdependence (as is often the case) and the extravert requires the contribution of the 'silent' member in order complete his/her tasks. In other words, if possible rewards are impeded by a 'silent' member, an extravert may too react with negative emotions (Carver, 2001). The issue of personality interacting with presence and synchronicity norms leads to the following propositions:

P4a: *With strong presence norms, individuals high in conscientiousness are more likely to make sure they are available by CMC, than individual low in conscientiousness.*

P4b: *A violation of synchronicity norms will lead to worry in neurotic individuals (based on an internalized notion that they have done something wrong), and anger in extroverts (whose rewards are delayed).*

Other norm violations provide interesting opportunities for understanding the role of motivational systems in virtual work groups. With the amount of email

reaching unmanageable levels in many virtual workers' inboxes, norms limiting email exchanges to a "need to know" basis are becoming increasingly popular (i.e., establishing more rigid reach norms). Consider a situation where an internal problem has emerged within a virtual work group, and it is currently being addressed within the group through CMC channels. At a certain point in the deliberations, a work group member makes a judgment to cc upper management on the discussion that includes all messages that have been exchanged about the problem. Other members of the group may perceive the cc'ing as both uncommon and unnecessary, and a thus violation of the reach norm. Group members who are high in BIS, and sensitive to potential punishment cues in the environment, may interpret the cc'ing of the message as a threat to their work and standing in the organization, and will react strongly with negative state emotions such as anger. In contrast, an individual high in BAS may welcome the norm violation, as it has the potential to result in reward (at a minimum having their work exposed to upper management) and will likely experience positive state emotions (e.g., elation) as they wait for a reaction. Additionally, consider a situation where a work group has had a minor success and a member surprisingly chooses to cc upper management on the achievement. Work group members who are high in BAS may interpret the publicizing of the achievement as a reward cue and thus experience approach motivation and associated positive emotion (for example, happiness). We would expect an individual high in BIS to experience happiness as well, but this happiness may be mixed with feelings of trepidation (and worry) until upper management does respond favourably. The

previous two scenarios lead us to the following propositions:

P5a: *In situations where a reach norm is violated and the content of the message is negative, individuals high in BIS will experience more anger than those high in BAS.*

P5b: *In situations where a reach norm is violated and the content of the message is positive, individuals high in BAS will experience more happiness than individuals high in BIS.*

Closely related to the concept of rehearsal is the ability to reprocess text-based messages. That is, unlike FtF environments, CMC provides a 'paper trail' that can be used for a variety of organizational and individual agendas. It is conceivable that a CMC message that elicited a strong emotional reaction (positive or negative) may trigger emotion memory nodes when the same e-mail is reprocessed for subsequent communication. A person who scores high in punishment sensitivity (BIS) may be more likely than others to recall negative emotions that are highly salient to communication with a particular person, or with respect to a particular topic. These negative emotions may influence the judgments such individuals make in a negative fashion. For example, if an employee inquired about taking vacation time and was greeted with the message, "Why don't we worry about vacations AFTER we get this project finished", it is likely that when the topic of vacation time is next raised, negative emotions may be experienced by this same individual. Note that the capitalization of the word 'after' is an example of a paralinguistic cue, placing emphasis on the word in question and likely increasing the likelihood of

someone high in BIS experiencing negative emotions. Similarly, a person high in reward sensitivity (BAS) is likely to recall positive emotions associated with previous CMC interactions. Once again, the effect of personality is likely moderated or mediated by the social context, leading to the following research question:

P6: *In considering the reprocessability of electronic text, individuals who score high in BIS are more likely to rehearse their messages than individuals who score high in BAS.*

In addition to the Big 5 factors and affective traits and states, there are additional constructs, including emotional intelligence (EI), that are likely pertinent to judgments made in virtual environments. EI has been defined as "the ability to perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth" (Mayer & Salovey, 1997, p. 5). Gasper and Clore (2000) showed that people high in EI are more likely to use the informational value of their and others' emotions. Emotionally intelligent individuals are able to assess the 'emotional climate' of the situation and react in a manner that uses the informational value of the situation to make an informed judgment (Salovey & Mayer, 1990). We concur with the sentiments of Fineman (2004) that in measuring emotions one must place emphasis on the interactional and context-focused dimensions of emotional experience. The scope of our inquiry into EI is restricted to postulating how people who are aware of self and others' emotions may form judgments in a virtual context.

While extraversion and neuroticism predict sensitivities to information of a particular valence, EI may facilitate emotional communication more broadly. Emotions may be imbedded in text in numerous ways including affective statements and questions, in addition to more nuanced linguistic and paralinguistic cues, including the use of emotive symbols (e.g., emoticons). The EI literature would suggest that persons more aware of self and other emotions may be more emotionally articulate than individuals low in emotional intelligence. That is, emotionally intelligent individuals could conceivably use text-based messages to encode affectivity in support of their objectives (Mayer & Salovey, 1997). For example, EI can be used to energize individuals through the use of affect saturated messages. Individuals who score highly in EI may be more aware of the feelings of a colleague in a virtual network who has put in an exceptional amount of effort, and may send a text message that acknowledges the work and commitment of their colleague.

EI may also enhance the ability to decode affect in text based messages. Individuals who score high in EI may more accurately detect emotive expressions or linguistic cues of affect. Being aware of self and others' emotions would arguably allow for more objective judgments regarding the emotive content and intention of a message. We are not aware of any research that has extended emotional intelligence into a virtual context.

P7a: *Individuals who score high in EI will use affect more strategically (defined as accomplishing predetermined goals) than individuals who score low in EI.*

P7b: *Individuals who score high in EI will use more paralinguistic cues (i.e., employ*

symbol variety) than individuals who score low in EI.

Another concept related to the encoding of virtual messages is rehearsability. Rehearsability refers to the extent to which you can practice or tailor a message to achieve the desired communication goals. Individuals who score highly in EI may rehearse their messages in order to ensure that communication goals (including the encoding of affect) are met. For example, an individual high in EI may take more time, than individuals low in EI, to craft a response to a message filled with anger. The individual high in EI may want to simultaneously acknowledge the person's anger, yet also ensure that all employees are aware of the deleterious impact of the message. It is also plausible that persons highly sensitive to punishment cues (high BIS) may also rehearse the writing of their messages in order to try to minimize any resultant negative responses. For example, someone who spends time ensuring that an e-mail could not be construed as offensive to another, or who tries to praise others, even when the situation does not appear to objectively warrant praise, may be trying to minimize future punishment. Conversely, extraverts (typically high in BAS) may spend very little time rehearsing messages, as more 'rapid-fire' send and respond norms may be inherently rewarding (that is, satisfy their reward cue needs).

P8a: *Individuals who score high in EI will rehearse their messages more than individuals who score low in EI.*

P8b: *Individuals who are extraverted will rehearse their messages less than individuals who score highly on neuroticism.*

We believe that another intriguing line of inquiry into emotions and judgments in virtual environments involves the well developed construct of emotional labor. While some disagreement still exists in the literature surrounding the exact definition of emotional labor, there is a general consensus that it involves suppressing felt emotions for organizational aims (see Ashforth & Humphrey, 1993; Brotheridge & Grandey, 2002). In a virtual setting, a communicator may suppress felt emotions for a variety of reasons, including group norms that run counter to expressed emotions, a belief that the expression of the emotion would not be productive in the given situation, or personality predispositions. In fact, staying 'silent' in a virtual environment when an emotional response is expected, may be a form of emotional 'retaliation', and provides an entirely new angle on emotional labor research. That is, communicators are free to feel and express their emotions outside of the virtual communication medium. So, while workers may experience certain emotions in virtual settings, their colleagues may be completely unaware of such feelings, while simultaneously these emotions are being expressed to family, friends or other on-line communities. While some might argue that suppressed emotions in a traditional work setting may also be displayed in other places (e.g., at home), the difference may be that there is less 'suppression' actually taking place. To be clear, virtual workers may have more latitude for expressing felt emotions due to the remote nature of their work. Still, the social context of the virtual communicators is likely to play an important role here as well, in determining whether emotional expression is an accepted norm.

P9: *Individuals working in distributed environments will suppress felt emotions more than those who work in collocated environments.*

CONCLUSION

While business environments have witnessed a dramatic shift toward the use of CMC technologies, there has been a relative paucity in the amount of studies examining how human interaction may adapt to these changes. This article systemically examined the role of personality and emotions in judgment formation in virtual environments. We contend that personality, emotions and judgments in virtual environments can be better understood by integrating well established Information Systems and Organizational Behavior/Psychology theories. The introduction of technology may not change how we experience emotions, rather, we contend that it is more likely to shape the information with which we base our emotional reactions and judgments. In short, we assert that virtual workers will adapt to CMC technologies based upon their personalities and social context. We offer the field a number of propositions that require empirical attention in order to better understand how personality and emotions influence judgments in virtual environments.

By combining the CMC literature with psychological theories we offer a theoretical framework and set of propositions well entrenched in established literature. With the pace of technological advancement it may be tempting to question whether there are such things as "virtual emotions" that somehow differ from the emotive processes in other aspects of our daily lives.

We contend that the underlying psychological processes that produce emotions and judgments remain the same, and we focus on aspects of the context for their expression (or suppression) as the factors that are changing. By providing the field with propositions grounded in well established theories, we offer only a taste of the possible research avenues involving personality, emotions and judgments in virtual environments. We encourage empirical examination of our propositions grounded in the notion that ultimately, humans (not cyberspace) determine how emotions are experienced and how subsequent judgments are formed.

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