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The Impact of Computer Mediated Communication Systems Monitoring on Organizational Communications Content

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The Impact of Computer Mediated Communication Systems Monitoring on Organizational Communications Content

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy
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Dedication

I dedicate this dissertation to my children, Liam and Calvin, without whom it would have been completed in a third less time but with more than double the stress. Thanks to you, playgroups, playgrounds, pregnancy, painting, pre-school, and puns have been staples of my years in the Ph.D. program. It is hard to imagine that any student could have smiled more, been hugged more, or enjoyed motherhood more than I have during your infancies and early childhoods. Your love, silliness, and need for lots of time with your Mama have meant myopic focus on schoolwork was never a risk for me. I love you both so fully. I hope that you each may enjoy the satisfaction that education has given your overeducated parents.
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When I commented in a seminar that no dissertation is the work of one person, I heard a resounding, “Thank you!” from its leader, Dr. Rosann Webb Collins. Dr. Rick Will and Dr. Stanley J. Birkin, along with Rosann and Robert, have generously guided and strengthened this work. For their service on my committee, I am grateful.

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Employer monitoring of communications is prevalent and on the rise due in part to the Sarbanes-Oxley Act, the Health Insurance Privacy Protection Act, and other legislation in the U.S. and other countries. However, the critical effect of this new activity on what is communicated in companies has not been assessed. This dissertation examines the impacts of computer mediated communication systems monitoring on neutral, incriminating and exculpatory content, as well as the overall volume of communications issued on monitored and non-monitored computer mediated communication systems. Incriminating communication is cataloged in a hazard communications taxonomy for this investigation. A controlled laboratory experiment has subjects participate in an instant messaging discussion on a topic for which they are likely to be aware of information that is incriminating to their organization, or its members, or both. Consistent with self awareness theory, monitored subjects engage in significantly less overall and neutral communication. They volunteer fewer high intensity hazard communications, but are less likely to curtail low intensity hazard communications. They
issue denials about more incriminating topics. Contributions to research include theory
development, especially in the area of standard selection; application of self-awareness
theory to the new domain of computer mediated communications monitoring; a research
framework; a taxonomy and coding scheme for the new hazard communications
constructs; and a relative standards influence instrument and methodology for use in
studying competing standards. Implications for corporate monitoring and
communications policies are discussed, and a research agenda is outlined.
Chapter 1

Introduction and Motivation

Introduction

Employer monitoring of communications is prevalent and on the rise. Electronic monitoring has long been used for customer service quality assurance, gathering employee feedback data, increasing security, and for the promise of productivity enhancements and management efficiencies. Dozens of statutes in many countries also now encourage or require that electronic communications be archived and sometimes reported on or produced on demand, strengthening monitoring motivations. Among the better known are the U.S. Sarbanes-Oxley Act ("Sarbanes-Oxley Act" 2002), Canada’s “C-SOX” ("Bill 198"); United Kingdom Regulation of Investigatory Powers Act Chapter 23 ("Investigatory Powers Act"), Securities and Exchange Commission Rule 17A-4 ("Title 17 of the Code of Federal Regulations (CFR), Rule 17a-4" 2001), and U.S. Department of Defense Rule 5015.2-STD ("Electronic Records Management Software Applications Design Criteria Standard" 2007).

This legislative trend has strengthened monitoring motivations. Given the increasing prevalence of recording of computer mediated communications (CMC) and the peril these records may create, proactive companies are monitoring their communications to take appropriate liability-limiting actions. For instance, many subject to the U.S. Health Insurance Portability and Accountability Act ("HIPAA") are choosing
to monitor e-mail to prevent disclosure of protected information and to identify employees who require additional education in this regard, while organizations subject to National Association of Securities Dealers (NASD) Rules 3010 and 3110 ("NASD Conduct Rules 3010 & 3110" 1999), are explicitly required to monitor the content of electronic communications. These monitoring activities may seek both to capture current communications behaviors and to influence them. We have reason to suspect that they also cause unexpected and unintended consequences.

Several theories suggest computer mediation encourages communication that is less inhibited or more extreme in some respects than face-to-face communication. For instance, anonymity effects and reduced social cues may lead to anti-social behaviors like flaming (Sproull et al. 1986). Use of computer mediated communications may even encourage an increase in hazard communications, which are messages that might tend to incriminate an organization or its members (Holton et al. 2006). Alternatively CMC may facilitate greater emotional content than face-to-face communications, amplifying social influence (Postmes et al. 1998), encouraging social disclosure (McGrath 1991), and leading to extreme, hyperpersonal communications with richer, more highly social content (Walther 1996). Another possibility is that an individual’s submersion in and isolation from a virtual group may limit communication, discouraging full contribution over CMC (social loafing) (Chidambaram et al. 2005) While there is ample evidence that computer mediation influences what people communicate, the nature of computer mediated communications is difficult to predict. Organizational monitoring of CMC adds complexity to this consideration. Might it attenuate extreme communications behavior? Or could it promote different extreme communications? These issues lead us to the
following research question: What impact does computer mediated communication systems monitoring have on the content of organizational communications?

**Motivation**

The prevalence of communications monitoring, and legal changes that are making it even more commonplace, along with the suspected, but ill understood impact of monitoring on communications content make this an area ripe for study.

**Electronic communications monitoring is prevalent and increasing**

The incentives for communications monitoring are extensive and increasing. The growth in monitoring of CMC represents a substantial environmental shift with potentially profound impacts on what is communicated in organizations, and ultimately on the work that gets done within them. We define this monitoring activity as reviewing computer mediated communications intended for other parties by organizational members whose formal role it is to perform this function. For instance, an internal auditor might read instant messages to determine whether restrictions on passing information between representatives of competing customers are being followed, or a security staff member might read email related to a suspicious activity to determine its legitimacy. In each case, monitoring is part of the monitoring individual’s role-consistent organizational duties. Intercepting communications for any purpose other than the fulfillment of an organizational role, or intercepting communications outside of the monitor’s organization lies outside of this definition.

Electronic monitoring has been employed for the promise of various productivity enhancements (Douthitt et al. 2001), for customer service quality assurance (Sherry 1998), for objective gathering of data for employee feedback (Urbaczewski 2000), and to
limit corporate risks, including legal liability (Varon 2003), and security breaches (Nadeem et al. 2006), among other applications. Computer mediated communications monitoring is a less studied practice.

Recently a great deal of legislation has strengthened communications monitoring incentives (e.g. "Bill 198" 2003; "Electronic Records Management Software Applications Design Criteria Standard" 2007; "HIPAA" 1996; "NASD Conduct Rules 3010 & 3110" 1999; "Sarbanes-Oxley Act" 2002; "Title 17 of the Code of Federal Regulations (CFR), Rule 17a-4" 2001; "Investigatory Powers Act" 2000). For instance, the Sarbanes-Oxley Act was described by President Bush as landmark legislation that “adopts tough new provisions to deter and punish corporate and accounting fraud and corruption, ensure justice for wrongdoers, and protect the interests of workers and shareholders” (Bush 2002). It has had a dramatic effect not just on American companies, but also on their subsidiaries in other countries, and on companies which are based in other countries but listed on U.S. exchanges. The rules issued by the SEC to enforce the Act are being interpreted to require every public company to store every document that influences the audit process for seven years (Varon 2003). A clear intention of these rules is to maintain records of communications originating inside a company that suggest, reveal or otherwise pertain to illicit or unethical activity occurring within it.

The legislation requires that computer mediated communications be recorded, stored, and produced on demand. The Act’s real-time disclosure rule also requires companies to self-monitor their records, both structured like those in accounting systems, and unstructured like those in communications systems, for events that must be disclosed under the provisions of the Act in real time (Worthen 2005).
While Sarbanes-Oxley is perhaps the best-known driver of the communications monitoring trend, other legislation carries provisions that more directly require or promote CMC monitoring. For instance, HIPAA has proliferated products to prevent e-mail, blog and other communications leakage of protected information ("HIPAA email compliance policy" 2008; "HIPAA email encryption and security compliance for healthcare" 2008; "HIPAA secure e-mail" 2008). Organizations subject to National Association of Securities Dealers (NASD) Rules 3010 and 3110 ("NASD Conduct Rules 3010 & 3110" 1999) have no discretion in the matter. They are explicitly required to monitor the content of electronic communications, and instant messaging is known to have been monitored as early as the year 2000 for some firms subject to its provisions."IM Shop?" 2004).

Given the increasing prevalence of recording CMC and the peril these records may create, proactive companies are monitoring their communications to take appropriate liability-limiting actions or to meet the explicit requirements of laws and regulations (Tam et al. 2005).

With this backdrop, it is not surprising that monitoring workplace communications is now the norm for U.S. companies, and various monitoring practices are still increasing in prevalence ("Electronic Monitoring Survey" 2005). For instance, between 2004 and 2005 (the last years for which comparable numbers were reported), e-mail monitoring increased 57 percent in U.S. companies (AMA "E-Mail and IM Survey" 2004; AMA "Electronic Monitoring Survey" 2005). Monitoring is now so prevalent that over half of employers have now fired workers for e-mail or Internet misuse, with approximately equal incidence of each (28 percent and 30 percent respectively).
("Electronic Monitoring and Surveillance Survey" 2007). Despite the myriad and growing uses, little is known about the impacts of employee communications monitoring on the content of communications.

**Monitoring is likely to change communications behavior**

While monitoring may seek both to capture current behaviors and to influence them, we have reason to suspect that it also causes unexpected and unintended consequences. A great deal of anecdotal evidence suggests CMC changes when monitoring *ceases*. For instance, meeting hosts turn off recording equipment when they want people to speak more freely. Reporters perk up when a source offers information “off the record”. Entire academic conferences have been held off the record to encourage the freer flow of ideas ("Speedbump Conference" 2004). Large industry conferences have also had an off the record restriction, like this one from a Google customer innovation conference, “All speeches and discussions at Zeitgeist are off the record. To ensure that our presenters and attendees can speak openly, no press coverage or blogging is permitted (Google 2005).” In this light it is surprising that academic literature is largely silent on the question of the impact of monitoring on computer mediated communications content.

Several theories also suggest that CMC encourages communication that is less inhibited in some respects than face-to-face communication. For instance, when users remain anonymous, they may contribute more candid views (El-Shinnawy et al. 1997) without fear of suffering non-conformity consequences (Nunamaker et al. 1991) or of embarrassing themselves. A meta-analysis concludes that anonymity does impact what people communicate over CMC (Baltes et al. 2002).
Other depersonalizing aspects of the nature of CMC media may encourage similar behavioral changes. CMC have been described as lacking in social presence given the limited range of both nonverbal and verbal cues and the communications context (Rice 1993; Short et al. 1976). The number of cues transmitted, channels used, and the degree of personalization are all also said to place limits on the information richness of a medium, with computer mediated communications channels ranking low in this respect as well (Daft et al. 1986). Cues filtered out theory (Sproull et al. 1986) explains that distance, posture, facial expressions, gaze, voice variations, and other social cues may not be conveyed at all (or only partially conveyed with more fully-featured CMC tools) and thus fail to influence or control the behavior of others (Hiltz et al. 1989).

Both anonymity effects and reduced personalization and social cues may result in decreased awareness of those with whom one communicates or even of one’s personal identity. They may also decrease the power of social norms to regulate behavior. Other paths through which CMC may reduce social influence include removing physical barriers so communicating parties may expect that they are more diverse from one another, and eliminating knowledge of similarities between parties. Each of these factors can lead to communications that are impulsive, extreme, and even anti-social, as in the case of flaming (Sproull et al.) , or which flout authority (Hiltz et al. 1989). These same factors may be responsible for an increased willingness to communicate negative information (Sproull et al. 1986).

Just as CMC may break down certain social boundaries, it is also possible that CMC may draw focus away from self and towards the group, providing the group with greater social influence over individual behavior (Postmes et al. 1998). According to the
social identity model of deindividuation effects (Lea et al. 1991), as deindividuation occurs (Festinger et al. 1952), group members become more sensitive to situational norms and responsive to environmental cues for appropriate behavior for the context. In absence of individuating information, CMC users may subrogate their own opinions and values to the group’s (Postmes et al. 1998). In this way, groups and dyads within which CMC occur serve as a source of social identity, and the medium is socially engaging. The social influence of the group may even lead to hyperpersonal communications with richer, more highly social content (Walther 1996).

Another possibility is that drawing focus away from the individual and towards the group may make individuals feel isolated and submerged within a virtual team, factors which, according to social impact theory, can lead to suppression of effort (Chidambaram et al. 2005). This may be expressed as fewer or lower quality communications than in face-to-face groups. On the other hand, given its ability to provide work structure, CMC may help to maintain focus on task deliverables, discouraging social loafing (Shepherd et al. 1995).

While there are ample anecdotes, theoretical bases, and empirical evidence that CMC influences what people communicate, the nature of computer mediated communications in a particular circumstance remains difficult to predict. Organizational monitoring of CMC complicates the prediction task. Under monitoring, will people be less candid and less willing to communicate negative information? Or will they be more deliberative about their communications and more likely to give balanced views including negative information? Will they seek to avoid notice, or be likely to contribute greater effort in hopes of being noticed? Will they be more tentative, or more expressive
of their opinions? Will certain topics be considered off limits, or will sensitive topics be discussed differently? Will people avoid extreme communications, or engage in different extreme communications? We begin to address these uncertainties and others with the following research question: **What impact does computer mediated communication systems monitoring have on the content of organizational communications?**

Consistent with self awareness theory, this study finds that monitored subjects engage in significantly less overall and neutral communication. They volunteer fewer high intensity hazard communications, but are less likely to curtail low intensity hazard communications. They issue denials about more incriminating topics. Contributions to research include theory development, particularly in the area of standard selection, application of self-awareness theory to the new domain of computer mediated communications monitoring, a research framework, a taxonomy and coding scheme for the new hazard communications constructs, and a relative standards influence instrument and methodology for use in studying competing standards. Implications for corporate monitoring and communications policies are discussed, and a research agenda is outlined.

This document proceeds with the following sections: review of the relevant literature, with the research model developed in the course of that review in chapter 2; research design, which includes a discussion of pilot test results in chapter 3, findings of the full study in chapter 4, and discussion, contributions to research and practice, and limitations in chapter 5.
Chapter 2

Literature Review and Research Model Development

In a pilot study (Holton et al. 2006; Holton et al. 2008) researchers found a significant relationship between monitoring CMC and changes in hazard communications content. While high intensity confessional communications decreased in frequency, no changes in moderate intensity whistle-blowing type communications were observed, and modest intensity hazard reports about which individuals had no first hand knowledge increased. Denials of knowledge of hazardous topics also increased under monitoring. In this section, we seek to elucidate the psychological processes involved in these changes. First, we consider how the performance monitoring, CMC and surveillance literatures jointly predict changes in communications behavior under monitoring. Next, self awareness theory is applied to build the research model, which also draws on CMC and surveillance literature streams. Ultimately, we posit that monitoring of computer mediated communications induces self focus, which increases the regulatory role of perceived organizational communications standards relative to personal standards, and precipitates changes in communications behavior. When negative or positive misalignment with the standards applied is detected, changes in communications are precipitated. The specific nature of these changes is predicted for sensitive hazard communications topics.
Performance monitoring

Performance monitoring is probably the best known and most studied use of computers to monitor activity within organizations. The impacts of performance monitoring via computer on performance, satisfaction, health, stress and other outcomes, along with attitudes towards monitoring and perceptions of supervision, have been widely examined. In the psychology literature, studies typically find higher quantity of performance (sometimes with lower quality), along with lower satisfaction, poorer health, higher stress, and other negative impacts on those monitored (Douthitt et al. 2001). Work within the information systems domain has found mixed results, sometimes suggesting that the nature of the monitoring and other factors surrounding it can lead to different outcomes (George; Irving et al. 1986).

While much of the performance monitoring literature is atheoretical, social facilitation theory, which predicts that in the presence of others, people will perform better on easy or well-learned tasks but worse on difficult tasks or those not well-learned is one explanation sometimes given for performance impacts in the presence of others. Social facilitation is said to take place due to the arousal provided by the presence of others. The classic interpretation is that this arousal encourages habitual responses, appropriate for simple tasks, but which may impair performance of tasks calling for non-routine approaches (Zajonc 1965). While computer mediated communications tasks range from simple and routine to novel and complex, it is the latter with which we are concerned, those for which monitoring seems most likely to impair performance.

Both this theory and the performance monitoring studies in general have focused on highly structured tasks like clerical work. Typical use of e-mail, instant messaging,
and other CMCs by knowledge workers is less structured and more complex (Rice et al. 1988). Further, we are not explicitly addressing performance variables. Even so, this literature indicates that the extent to which one is focused on others, as contrasted with experiencing oneself as an isolated individual, will impact one’s approach to a task.

**Computer mediated communications**

Computer mediated communications (CMC) encompass all forms of communication transmitted between two or more people via computer networks. CMC applications are many and ever expanding with significant consequences for organizations (Cameron et al. 2005). In a very broad sense, CMC systems include those providing e-mail, text chat and instant messaging, group decision support/group support, bulletin boards, listservs, virtual workspaces, online conferencing, massively multi-player online games (MMOs), weblogs (blogs), wikis, and the exchange of RSS (web feeds). CMC systems may support communications that are synchronous or asynchronous; sequential or parallel; anonymous or identified; ephemeral (not recorded) or persistent (recorded); reheasable (allowing review and editing of a draft message before sending) or instant; dyadic, one-to-many, or many-to-many. They can reach around the world and be used by those in the same room. They differ in the degree to which they convey social presence. The simplest merely convey typed messages, but most have an array of features to support communication.

Anonymity, or lack thereof, is a well-studied characteristic of CMC. While full anonymity is not a typical feature of organizational CMC use, “visual anonymity,” or communication without visual contact with other communicating parties, often is. That
visual anonymity has been found to have similar impacts to full anonymity causes us to consider it here (Spears et al. 1990).

Anonymity is an important driver of deindividuation, a sense of losing one’s own identity to a group (Festinger et al. 1952). Anonymous individuals experience a reduced state of self awareness in which they feel unidentified and unaccountable. Deindividuation is said to reduce the restraints one normally places on one’s behavior to inhibit unsanctioned behavior. Consequently, unsanctioned behavior increases (Sproull et al. 1991). When this line of reasoning is applied to visual anonymity in a CMC system, it predicts that unsanctioned communication increases as compared with less anonymous media or face-to-face communications. To determine the effect of monitoring on unsanctioned communication, we next turn to the surveillance literature.

**Surveillance**

Researchers have not converged on a single definition of surveillance, but much academic literature on the topic seems to implicitly define surveillance as close observation of a person or group by law enforcement. While the same communications monitored by organizations could conceivably be surreptitiously monitored by law enforcement, it is intra-organizational role consistent interception of communication intended for other parties with which we are concerned in this study. Despite the differences in definitions, monitoring can have the aspect of close observation by an authority, thus we consult the surveillance literature for insights relevant to the study of communications monitoring.

Surveillance has been described as a means of exercising social control (Deci et al. 1985), and the social implications of closed circuit television (CCTV) have received
some academic attention. Displacement of monitored activities is one of the commonly observed outcomes of CCTV surveillance (Short et al. 1998). Behavioral changes under surveillance are often explained with reference to Foucault’s panopticon (1977): belief that one might currently be monitored is sufficient to induce changes just as if the monitor’s presence were certain. The possibility that deviant or otherwise undesirable behavior may draw a monitor’s unwanted attention suppresses it.

If the attention is oppressive, when possible, individuals escape the panoptic gaze, resulting in displacement of undesirable behaviors to an unmonitored setting. Although visual anonymity in a CMC system may lead to less desirable communications behavior, surveillance literature predicts that when monitored, such behavior may be displaced to an unmonitored channel or suppressed. It is also possible that organizational CMC monitoring is considered far less oppressive than the panoptic prison, limiting its ability to induce effects through this mechanism (D'Urso 2004).

Surveillance research has been criticized as being under-theorized (Vorvoreanu et al. 2000). To better understand the impact of monitoring CMC on communications content, we turn from the broad, non-specific panoptic approach to a well-developed literature stream, self awareness theory, which better addresses the aims of this research.

**Self awareness theory**

Reduced self awareness has been called the key psychological constituent of the manipulation of deindividuation effects, (Postmes et al. 1998), the same effects which are believed to underlie much computer mediated communications research. In contrast, as we will see, monitoring CMC may increase self focus, the construct of primary interest in self awareness theory.
Self focus has been a topic of academic inquiry for over a century, gaining early prominence in the work of symbolic interactionists (Cooley 1902). It has been studied empirically since 1932 when a research methodology was developed (Wolff 1932). Self focus is also referred to as self-directed attention and is a state construct similar to the trait construct self-consciousness. Self awareness, which has sometimes been used interchangeably with self focus, is more properly defined as the ability to recognize one’s existence (Joinson 2001), and as such it is a pre-cursor to self focus.

At its heart, self awareness theory predicts that when self-focused, people evaluate themselves according to a standard relevant to the area of self focus. When they find themselves falling short of or exceeding the standard, they become motivated to alter their behavior to achieve alignment between self and standard. When they find alignment, they are motivated to maintain it by inhibiting standard-inconsistent actions. We now examine the relevance of self awareness theory to CMC monitoring.

Human attention is a limited resource. It is selective, and of limited capacity (Posner 1982). While we may rapidly switch between objects of attention, the number of objects to which we may simultaneously attend is very limited. According to self awareness theory (Duval et al. 1972), attention is bi-directional. It is oriented either towards oneself or towards one’s environment. Self focus is the act of directing attention towards oneself rather than towards one’s environment. This same term is applied to the state of being engaged in the act of self focus. When an individual is self-focused, his or her attention is drawn to whatever aspects of self are then salient, typically to situational factors such as the event that drew focus to self, the current or upcoming performance of a task, or an attitude or belief relevant to these.
Researchers disagree whether “public” and “private” self focus are distinct constructs. Public self focus is the concern for self as a social object (Buss 1980) and relates to self-presentation (Scheier et al. 1983). With private self focus, an individual is attuned to his or her own thoughts and emotions (Scheier et al. 1978). Wicklund and Gollwitzer (1987) present several persuasive theoretical arguments that public and private self consciousness are not distinct constructs. They reason that since thinking about oneself per private self focus is said to preclude thinking about another’s impression of oneself per public self focus (Buss 1980), measurements of private and public self focus should be inversely correlated. However, across many studies, these measures have been found to be “disturbingly high[ly]” correlated (Wicklund et al. 1987, p. 502). Further, these authors discuss the tight entanglement of means of induction of self focus and whether public or private self focus is induced, noting inconsistency between the operationalization and definition of private self focus. Private self focus is said to focus on aspects of self which are not observable. Nevertheless, subjects are presented with observable aspects of themselves to induce this state. For additional arguments, the reader is referred to (Wicklund et al. 1987). We find their review of empirical results conclusive in supporting their reasoning and thus make no further distinction between the two.

Engaging in CMC has been found to reduce self awareness of oneself as engaged in social interaction with an audience (Matheson et al. 1988). We posit that monitoring CMC restores it.

According to self awareness theory, there are two causes of self focus, namely that it is generated by reminding one of oneself or by placing one in a figural-ground contrast (Silvia et al. 2001). Early researchers experimented with many means of inducing the self-
focus state, primarily by providing self-reminders. An individual’s own voice (Wolff 1932), video image (Duval 1976), and reflection in a mirror (Hormuth 1982), the presence of a video camera (Wicklund et al. 1971), physically present observers (Innes et al. 1975), social disruptions (Shibutani), experimenter instruction (Taylor et al. 1975), presentation of symbols of self (Duval et al. 1972), writing about oneself (Fenigstein et al. 1984), and experiencing oneself as a minority (Duval 1976) have all been found to be effective means of self focus induction. Several of the methods of inducing self focus have the bearing of monitoring. In particular, the physical presence of others and video cameras afford means for observing an individual’s behavior contemporaneously or after the fact through review of a created record.

One study has used video cameras to induce self-focus during a CMC task (Yao et al. 2006). The study uses traditional video cameras and webcams, without explaining to subjects how the video images would be used beyond “for a separate research project.” Peers were said to be using the images, not one or more authority figures within the organization within which communications occurred. In one condition, the cameras were used to show subjects their own image. Thus the investigation illustrated that traditional video camera self-focus manipulations are effective in a CMC context, but it did not provide a test of the effect of organizational monitoring.

While the reminders of self have been the primary form of experimental self focus induction, CMC monitoring affords a number of possibilities for increasing self focus through Gestalt figure-ground effects on attention (Koffka 1935). According to this Gestalt principle, a figure attracts attention because it is smaller than the surrounding ground. When studying attention, the principle was initially applied to visual stimuli, but it has also been successfully applied to other stimulus-attention effects (Duval et al. 2001).
In the realm of CMC monitoring, simply drawing another’s focus by any means is a relatively rare event (Handel 2005), and thus the figure against the ground of times at which one is not the focus of others’ attention. This figure-ground relationship brings one’s attention to the fact of the other’s focus. Monitoring is an even smaller figure among the class of situations in which one draws another’s focus, creating a greater figure-ground contrast that may magnify this effect.

The figure-ground principle also applies to the properties of people, with the less abundant property serving as figure against the more common ground (Duval et al. 2001). When monitoring CMC for compliance with company policies or other regulations and laws, an observer, particularly one with the power to initiate sanctions, may be thought by the observed to have greater status. In this circumstance, the lower status level of the monitored individual serves as figure, drawing attention to the self.

Finally, the CMC monitoring role may be believed to be held by more than one person. Multiple monitors serve as ground against the observed individual who becomes the figure of his or her own focus.

If CMC monitoring becomes conspicuously prevalent in some context, the act of monitoring may be insufficient to cause figural attention. However, accountability is expected to increase in this circumstance, providing its own figure-ground contrast. Those to whom one is accountable are likely to outnumber oneself and to be perceived as more powerful than oneself, creating a ground that brings focus to self. These figure-ground contrasts are presented in Figure 1.
CMC monitoring encourages organizational standard selection

Once individuals are self-aware, self-schema are brought to mind creating the likelihood of self-evaluation (Gibbons 1990). The outcome of this evaluation depends on the standard applied for assessment (Duval et al. 1972). Standards are “images of correct ways to think, feel, act, and be (Duval et al. 2001, p.31).” They “aren’t simply ‘behavior tendencies’ – they are comparison points that only influence action when participating in self-regulation (Silvia 2002, p.5).” Standards perceived as relevant to the self-aspect made salient
are selected for this comparison. Retrieving standards from memory for consideration for the self-standard evaluation thus increases their influence on behavior regulation.

Prior work on self awareness has avoided the standard selection issue by presenting a single standard or selecting subjects for experimental study based on pre-measured personal standards (Silvia et al. 2001). While convenient for the purpose of academic study, neither of these single standard conditions is realistic for organizational environments. In the current study, we consider the standard selection issue in a realistic context where standards may be somewhat ambiguous (Chociy 1997), potentially in conflict with each other, and not explicitly presented at the time of self focus.

In the communications monitoring context, two candidate standards are the pre-existing communications standards of the individual and the perceived communications standards of the organizational monitor. These standards may be congruent or overlapping in some cases. However, in other cases, organizational members’ personal communications standards will be misaligned with a perceived organizational standard for communication. For instance, personal communications standards may favor openness while organizational standards support discretion. The attention brought to self by CMC monitoring is used not only to retrieve candidate standards and select an appropriate standard, but also to ignore “interfering” information (Chun et al. 2001; Norman et al. 1986). Thus while more than one standard may be considered, increasing the behavior regulatory influence of each, when standards are in conflict, the influence of the most relevant standard will increase while the relative influence of competing standards on behavior regulation will fall. Issues of perspective-taking and salience aid in selecting between competing standards.
Self focus has been conceptualized as taking the perspective of some other person’s viewpoint of the self (Mead 1934). This property encourages adoption of an organization’s unchangeable standard (unchangeable by the monitored at the time of monitoring, at least) even when a personal standard is in conflict with it. Experimental work finds this to be a typical case, with dozens of studies showing choice of a just-provided third party standard over the personal standard that operates in its absence (Wicklund et al. 1971).

Another possibility is that individuals will resolve any perceived standard discrepancy between candidate standards by bringing the personal standards within their control in line with perceived organizational standards that they cannot control. Research suggests that rather than aligning standards, choice of whichever standard is salient is more likely. A review by Silvia et al. (2001) elucidates the primary role of salience in the selection of standards. In laboratory studies, when an organizational standard was presented in advance of a task, that standard was applied. When it was presented after, subjects adhered to their just applied personal standards. In organizational contexts, the organizational standard may not be presented immediately in advance of behavior selection. However, in the case of CMC monitoring, the act of inducing self focus via knowledge of an organizational monitor’s activity also encourages recall of or speculation on the organization’s standards for communications, increasing the likelihood that they will be salient. This too favors choice of an organizational standard over a personal standard.

When a negative aspect of self is made salient, it can inhibit the transition to some other person’s perspective (Stephenson et al. 1983), lessening the likelihood of adoption of another’s standard. In the case of monitored CMC, it is one’s communications that are the focus of the monitor’s attention, and it is this aspect of self which theory predicts will become
salient. Communications are not typically perceived as an inherently negative aspect of self (McCroskey 1977), so the transition to the monitor’s point of view is not expected to be impeded in this regard.

Organizational perspective-taking and organizational standard salience, along with it being unlikely that personal and organizational standards will be brought into alignment or that a negative evaluation of one’s communications ability will impair shifting to an organizational standard, all lead to the same conclusion: When self-focus induced by monitoring makes organizational standards that compete with personal standards more salient, the regulatory influence of organizational communications standards will be increased at the expense of the influence of personal standards.

**H1:** Organizational monitoring increases the regulatory influence of perceived organizational communications standards on computer mediated communications content relative to personal standards.

**Organizational CMC monitoring changes communications behavior**

According to self awareness theory, once a standard is selected for the self-standard comparison, individuals assess their conformity with it. In its original form, the theory predicted that individuals would always find self falling short of the standard (Duval et al. 1972). It was reasoned that since few aspects of self are likely to be assessed to be perfect, holding oneself to a perfect standard would always lead to the discovery of inadequacies to some degree. Later work by both of the theory’s original authors and others has determined this finding of personal inadequacy is not essential to its function .(Silvia et al. 2001; Wicklund 1975). However, even when self is assessed to exceed the standard applied, a behavior-motivating discrepancy exists (Duval et al. 2001).
When self and standard are in alignment, positive affect can result and no behavioral change is anticipated (Greenberg et al. 1981), but individuals are still motivated to inhibit future standard-inconsistent behavior (Gibbons 1990).

When behavior is misaligned with the standard applied, two paths are possible for resolving this aversive affective state: One may either try to avoid the self-focus state, or to more closely align oneself with the standard applied on relevant dimensions. In the circumstance of monitored CMC, avoiding self focus means reducing or avoiding use of monitored communications channels that induce it. Users seeking to more closely align to a perceived organizational standard can easily do so by changing their communications behavior to be congruent with it. Thus to the extent that a monitored channel cannot be fully avoided, self awareness theory predicts that use will be reduced and that the content of the communications delivered changes from those communications delivered via non-monitored channels.

Since communications can vary so widely, understanding the degree to which communications behavior changes and the nature of those changes depends on a number of factors, among them the characteristics of the communications topic, the organizational context, and the organizational environment. We now examine each, choosing for primary focus a category of communications that is sufficiently broad to be relevant to a variety of organizational communication topics: hazard communications.

Hazard communications are messages that might tend to incriminate an organization or its members (Holton et al. 2008). These suspicious messages do not necessarily indicate illicit activity. They may be byproducts of productive problem solving processes (brainstorming) as options are generated, refined, and culled. They
may reflect misunderstandings or incorrect suspicions. They may pertain to preventing or correcting mistakes. But whatever their motivation, they have in common that they have the potential to draw unwanted attention when computer mediated communications are monitored.

Hazard communications are organized into a taxonomy of high, moderate, and modest intensity (Holton et al. 2008). High intensity hazard communications are personally incriminating communications by an organizational member. We label this category _negative self-disclosure_. Because any organization is represented by its members, these communications may also tend to incriminate organizations. Moderate intensity hazard communications offer personal knowledge of incriminating behavior without implicating the communicator. We label this category _observed_. Observed hazards still tend to incriminate organizations but entail a lesser degree of personal risk. Finally, modest intensity hazard communications are relayed reports of information not personally known to the communicator. We label this category _hearsay_. Because they are unsubstantiated, hearsay hazard communications are less incriminating than those in the other two categories.

Within these three categories, hazard intensity is determined by the specificity of the communication. Specific reports are likely to incriminate more individual organizational members and to be more actionable than general information. For instance, if petty cash is to be used only for business operating expenses, reporting, “I’ve witnessed that people often use petty cash for office parties,” is a lower intensity statement than the more detailed, “For Mary Byrne’s birthday party in June, her manager told the department secretary to buy a cake and candles with money from the petty cash
box she keeps.” While the former could lead to reform of petty cash reporting and auditing processes, the latter could do both that and result in punitive action for parties who knowingly violated company policies. This intensity taxonomy is depicted in Figure 2.

The specific domain of the communication within an organizational context may also provide an indication of the level of intensity. Where the intensity of communications topics can be ranked within a given organizational context, the taxonomy presented in Figure 2 applies within a topic’s ranked position or level. Overlaying a domain-specific taxonomy results in a number of such grids, each within a domain of communications topics. The example provided above is in the domain of
fiduciary responsibility and accountability. In this domain, the amount of money in
question is one determinant of the degree of organizational and personal incrimination.
Within the category of infractions under $100, hazard communications might be
considered to be of similar baseline intensity so they can be ranked per Figure 2.
However, we would not rank the specific report about using petty cash for Mary’s party
above a more general one about corporate fraud amounting to hundreds of thousands of
dollars. The latter is at a higher level of intensity. A hypothetical distribution of hazard
intensity across selected organizational domains is provided in Figure 3. Thus
determining hazard communications intensity also requires either considering the
importance of the topic within the organizational context, or limiting oneself to topics of
a single topic area at approximately the same baseline intensity level.
Figure 3. Illustration of hypothetical hazard topic domain effects
Just as the organizational context is important in determining hazard intensity level, so is the operating environment of the organization. In the U.S., Sarbanes-Oxley and other regulatory incentives for monitoring may influence the assignment of a topic to a hazard level. For instance, with Sarbanes-Oxley receiving so much attention, embezzling may be seen as more hazardous than Occupational Health and Safety Administration regulation violations.

Based on this understanding of the nature of hazard communications, we can now predict the nature of behavioral responses to computer mediated communications monitoring.

**CMC monitoring changes the incidence of hazard communications and related denials**

Hazard communications are defined by their potential for incrimination. While some organizations and organizational monitors may wish to hear about some incriminating behaviors in some circumstances, potentially incriminating topics are often taboo within organizations (Syrett 2001), which is to say in violation of an organizational standard for appropriate communication. Per self awareness theory, individuals are motivated to bring their behavior into alignment with these standards. When monitored channels must be used, this requires suppressing communications that are most clearly misaligned with organizational standards. Thus we provide H2:

**H2:** Organizational members make fewer higher intensity hazard communications under organizational CMC monitoring than on unmonitored channels.

Organizational communications standards are often incomplete and ambiguous with written policies failing to cover many contingencies (Gilsdorf 1992). (Examples are examined in the following chapter.) Without hard and fast rules for acceptable
organizational communications, where to draw the line is a judgment call. When there is only a minor potential incrimination of the organization or its members, it is more likely that a communication will be perceived to be aligned with the standards of an organization. For instance, even if borrowing petty cash for personal uses is strictly forbidden, borrowing 75 cents for a soft drink is not very incriminating to the individual, and does not represent a level of financial impact that would cause shareholders to charge the organization with fiduciary negligence. Even so, the action is in violation of an organizational policy for petty cash management. With such minor policy violations, it is less clear whether communicating about the incident is misaligned with organizational communications standards. When low intensity hazard communications are perceived to be in alignment with organizational communications standards, no behavioral motivation exists. The smaller or absent motivational effects of perceived self-organizational standard misalignment in these cases leads to H3.

**H3:** The decrease in the frequency of high intensity hazard communications between monitored and non-monitored conditions is greater than the change in frequency for low intensity hazard communications.

A related class of communications which may be influenced by the attempted alignment of one’s communications to an organizational standard is denials of knowledge of hazards. For example, given an understanding that use of petty cash for non-operational expenses is prohibited, when the topic turns to questionable uses of petty cash, one way to avoid engaging in hazard communications, and possibly even guide discussion away from the hazardous topic, is to deny any knowledge of inappropriate uses of cash box monies.
Denials corresponding to each level of hazard intensity are possible, as are general denials not specific to any one level. People can deny knowing about incriminating acts, engaging in them, witnessing them, and/or hearing about them. They can also deny knowledge indirectly by making statements qualified as suppositions, implying no personal knowledge. For instance, in the petty cash example, one might say outright “I’ve never heard about anybody misusing the funds in the cash box,” which is a hard denial of relayed reports, or alternatively, “I wouldn’t think anyone here would touch the cash box except for approved uses,” a soft general denial not tied to any one of the hazard intensity categories.

Because denials are both non-incriminating and potentially exculpatory, they are an alternative means to suppressing hazard communications for changing communications behavior to be congruent with a perceived organizational standard. This leads to H4:

**H4:** Organizational members engage in more denials of knowledge of hazards under organizational CMC monitoring than on unmonitored channels.

**CMC monitoring reduces communications volume beyond hazard communications effects**

Self awareness theory tells us not only that individuals will seek to align their communications behaviors to an organizational standard under monitoring, it also tells us they will seek to avoid the motivational affective state induced by monitoring when possible. In most organizational settings, it is not possible to completely avoid monitored communications. As noted herein, most employers routinely monitor communications. However, the extent of use is somewhat within employee control. Messages can be terse or more descriptive, including or leaving out details, opinions and beliefs. Live
communications sessions like those occurring over instant messaging and virtual conferencing systems can be shorter or longer as participants choose. While hypotheses 2-4 predict changes in hazard communications and associated denials, the incentive to limit communication over monitored media suggests that neutral communications unrelated to incriminating behavior will also be affected. H5 predicts this effect:

**H5:** Organizational members engage in a lower volume of neutral communications under organizational CMC monitoring.

With H2 and H5 predicting decreased communications (of hazards and neutral communications), and H4 predicting increased communication (of denials), the question arises as to whether communications volume increases or falls overall. While communications vary across business contexts and cultures, and we are aware of no studies that try to catalog business communications in a way that is broadly generalizable, the development of the hazard communications construct allows us to explore the volume of projected changes.

The hazard communications construct is derived from negative self-disclosure, whistleblowing, and gossip literature streams (Holton et al. 2008). Negative self-disclosures, the highest intensity hazard communications, are considered to be risky in organizations, causing employers to take specific steps to promote them when they are desired, for instance in hospital mortality and morbidity conferences, military after action reports, and corporate exit interviews (Feldman 1999; Garvin 2000; Orlander et al. 2003). Whistle-blowing is an activity typically perceived by employees to carry heavy risks for the whistleblower, including job loss, discouraging this type of communication (Dozier et al. 1985), but legislative incentives have required whistleblower protection in recent years ("Sarbanes-
While the incidence of high intensity negative self-disclosures and moderate intensity whistleblowing may be somewhat modest, gossip is a mainstay of organizational communication (Noon et al. 1993). Gossip may include received reports of incriminating information, which are modest intensity hazard communications. However, the theory presented herein foresees that modest intensity communications are least susceptible to the effects of monitoring (H3). Neutral communications containing no hazard content are believed to be more common than hazard communications. That this category is also expected to fall (H5), allows us to predict that the expected reductions in hazard and neutral communications will exceed those of the expected increase in denials, providing H6:

**H6:** Organizational members engage in a lower volume of communications under organizational CMC monitoring.

The research model is summarized in Figure 4.
Figure 4. Research model

H1: Organizational monitoring increases the regulatory influence of perceived organizational communications standards on CMC content relative to personal standards.

H2: Organizational members make fewer higher intensity hazard communications under organizational CMC monitoring than on unmonitored channels.

H3: The decrease in the frequency of high intensity hazard communications between monitored and non-monitored conditions is greater than the change in frequency for low intensity hazard communications.

H4: Organizational members engage in more denials of knowledge of hazards under organizational CMC monitoring than on unmonitored channels.

H5: Organizational members engage in a lower volume of neutral communications under organizational CMC monitoring.

H6: Organizational members engage in a lower total volume of communications under organizational CMC monitoring.
Chapter 3
Research Design

This impact of CMC systems monitoring on communications content was studied with a laboratory experiment using a 2 x 2 design consisting of organizational standard presentation and training, or neither presentation nor training; and monitoring vs. no monitoring conditions for an instant messaging discussion. Instant messaging is of interest since it has been projected to surpass more frequently studied communications channels as the primary real time communications channel for business by 2013 (Kerner 2007). The subjects, measures and research method are described in this chapter.

Subjects

Undergraduate subjects were recruited by circulation of a sign-up sheet in upper level information systems courses for the pilot study (n=40), and in upper level courses in each of five disciplines for the main study (n=86): marketing, psychology, public relations, nursing, and history. Subjects in each of the two recruitments were treated as a single pool, and were randomly assigned to treatment condition without regard to their source.

In pilot testing, age was found to be a significant factor that subjects volunteered to explain their lack of exposure to hazard communications topics. Subjects participating in the pilot also suggested differences in the hazard domain according to GPA. Country of origin is of potential interest since academic honesty ethics and practices vary around the world, providing a potentially extraneous source of variation in results. Year of first
IM use was collected and converted to a years of experience measure to allow control for familiarity with the technology if needed. Home campus and year in school were included in the demographics to control for dissimilar experiences that could cause changes in knowledge in the hazard domain if necessary.

**Experimental manipulations**

Two manipulations were employed: monitoring by an organizational authority and presentation of and training on an organizational standard.

**Monitoring manipulation**

A basic, text-based instant messaging system that provides rehearsability and which is used non-anonymously and synchronously for dyadic communications, possibly including parallel communications, was used for the experiment. Instant messaging is of rapidly increasing importance for organizations, and the system chosen for the investigation mimics instant messaging systems features typical in organizational environments. A benefit of this system is its support for the monitoring manipulation employed.

Half of subjects, those in the non-monitoring condition, were told that no one would have access to their records beyond the students collecting data, and that while the professor assigning participation in the activity would be given their names as a record for course credit, the data the subjects provided would not be shared with the professor. The other half of subjects, those in the treatment condition, were told that while the data collected was for a student group project, the university’s Office of Academic Honesty had asked for copies of the session transcripts. This is a fictitious office. Subjects in this condition were then asked
for their permission to have their transcripts included in the group that office receives. Upon agreeing to monitoring, subjects were informed that a recording device was being turned on, and a bright red reel-to-reel recorder appeared below the chat window as a visual reminder that the session was being recorded for the monitor’s use. In the main study, the subject’s attention was called to the recorder image, an addition to the protocol since the pilot test to increase the manipulation effect. A screen shot is provided in Figure 5.
Organizational standard manipulation

In consideration of corporate standards for IM content, dozens of electronic communications policies were collected from public sources. Normally, one or more communications sections were found within documents or on websites with labels like

**Figure 5. Monitored condition screen** (Adapted from (Holton et al. 2008))
these: electronic communication policy, acceptable standards of communication, appropriate use of electronic communication and technology, human resources policies, business conduct and ethics, network use policy, computer use policy, appropriate use of IT. Policies that appeared not to have been updated in more than two years; that were issued by Internet service providers, libraries or public use facilities; that addressed only communications between organizational members and the public; that limited themselves to wireless communications; and that were samples or templates rather than issued policies were excluded from consideration. Ten policies passing these exclusion criteria were randomly selected from the original convenience sample for detailed analysis ("Acceptable computer use policy" 2007; "Acceptable use practice" 2006; "Business Conduct and Ethics" 2007; "Computer use policy for CDI Corporation and its related companies" 2006; "Computer use policy: Policy restricting personal use of employer's computer"; "Computer, email and Internet use policy"; "E-mail and electronic communication policy" 2006; "Electronic communication policy for all Volt entities, affiliates, subsidiaries and divisions"; "Staff acceptable computer use policy" 2006; "Statewide policy: Appropriate use of electronic communication and technology" 2006).

While the communications directives of the policies varied widely, all ten stated that communications systems are subject to monitoring. Four provided no restrictions on the purposes of monitoring, while two others explicitly stated that communications could be monitored for any reason. Of the other four, the following monitoring motivations were given: maintaining system integrity and ensuring that users are using the system responsibly, confirming policy compliance, confirming law and policy compliance, and for security and network maintenance.
All but one of the policies specifically mentioned e-mail communications among those governed by the electronic communications policy, and eight of the ten specifically listed non-email communications systems as well. However, only two mentioned instant messaging, and one those prohibited use of IM. (Twenty percent of sampled policies addressing IM is similar to the 31 percent of companies reporting having an IM policy in place in the 2006 AMA survey on this topic ("AMA Workplace CMC Survey" 2006)) Prohibiting IM may be a tempting option for companies given the security concerns it raises. When it is not prohibited, explicitly addressing it seems warranted given how easily unrestricted use can lead to harmful disclosure of data and other security lapses (LeClaire 2006; Macavinta 2007; Muse 2005).

All ten policies provided lists of prohibited communications, with violations of law (copyright, trademark, fraud, threats, harassment), disclosure of proprietary information, concealing or misleading about the sender’s identity, commercial communications unrelated to the employer, obscene content, and avoiding spam being the most common restrictions. That anonymous CMC was typically prohibited by the policies suggests that additional research into non-anonymous instantiations, such as the IM investigation undertaken herein, is merited. Two policies prohibited communications contrary to company interests separate from these general categories, including communications “contrary to [the company],” and communications on public forums “that are in any way disruptive or harmful to the reputation or business.” Three noted that communications could be subject to legal disclosure requirements. Despite often lengthy lists of prohibited communications behaviors, one policy noted that “no policy can lay down rules to cover every possible situation.”
While emerging technologies offer myriad communications benefits, little was included in the ten policies on desirable communications, with much shorter lists of appropriate communications qualities provided (e.g. of high ethical standards or in accordance with the law). Each of the policies allowed limited personal use of electronic communications channels. In addition to these general guidelines, one policy noted that electronic communications should be used for collaboration, while two others urged communications that use “tone and words [that] would not cause embarrassment to themselves or the Company if the message were made public,” and those that, “will reflect favorably on the Company and on the employee.”

In the case of hazard communications, it is often unclear exactly which communications might be considered contrary to company interests. For instance, one of the more specific of the policies reviewed states both that electronic communications must adhere to high ethical standards and that they should not cause embarrassment. The no embarrassment directive is similar to the potential incrimination criterion in the hazard communications definition. If unethical behavior were known to occur, how the company would prefer for an employee to communicate about it over CMC is unclear. On the one hand, promoting ethical behavior should not cause the company embarrassment, suggesting CMC aimed at curtailing the offending behavior might be welcomed. On the other, the fact that the unethical behavior took place might itself be considered to be potentially embarrassing.

Since organizational communications policies are often ambiguous with regard to hazard communications, but do sometimes provide guidance, an organizational standard was crafted for presentation to half of the subjects in each the monitored and non-
monitored treatment conditions. To encourage high power while retaining realism, the organizational communications policy presented in the experiment was very similar to the most restrictive of the policies sampled. It was distilled down to just those terms most relevant to hazard communications. The experimental CMC policy did not mention monitoring as that aspect is communicated separately in the monitoring manipulation. The policy first generally presents the need to avoid certain inappropriate communications, and then specifically requires that communications reflect positively on the organization. At the time of the pretest, subjects in the organizational standard condition were told that the following policy governs electronic communications, including those over instant messaging:

“Electronic communications like email and instant messaging are considered to be documents subject to legal discovery (subpoena) and information requests under Florida’s government in the sunshine law in the same way as contracts and memos. Care should be taken to avoid unprofessional, unethical, and unlawful electronic communications. The privacy of electronic communications cannot be guaranteed. All electronic communications should reflect positively on the University of South Florida.”

Subjects randomly selected to receive this organizational communications policy were presented with three training items to demonstrate and test their understanding of the intended restrictive application of the policy. For each, they were asked to consider whether the instant messaging conversation shown is in violation of the just provided policy. The policy remained on the screen at all times for reference. A pilot test with 17 subjects not included in the experiment confirmed the need for feedback on the intended restrictive application of the policy as they tended not to score each example as a
violation. Feedback on the appropriateness of each sample communication under the
given policy was presented only after subjects had labeled a scenario as consistent with or
in violation of the policy. The three examples are as follows:

**Example 1**: An IM conversation between student advisors.

**Lorelei Bell**: I heard that we got some t-shirts delivered with the logos printed
backwards. Know where I can get one?

**Genevieve Loki**: They were supposed to be destroyed to protect [the
organization’s] image, but Calvin’s got some listed on eBay.

**Genevieve Loki**: His userid is “ugeek” so you can search on that.

**Lorelei Bell**: K. Thanks.

Feedback: This conversation is in violation of the organizational communications
policy provided. Genevieve has revealed that an employee used the employer’s property
(misprinted t-shirts) for personal gain. This does not reflect positively on the company.
Furthermore, the exchange reveals that a company employee risked harming the
organization’s image. This too fails to reflect positively on the organization per the
policy, instead presenting a negative aspect of the organization.

**Example 2**: An IM conversation between help desk software support staff
members.

**Mason Scott**: Hey, can you help me with a caller?

**Mason Scott**: He’s saying he’s got a copy of Camtasia “under our site license,”
but we don’t have a site license.

**Delaney Peters**: What’s his name?

**Mason Scott**: Greg Bates.
**Delaney Peters:** Oh, that’s Dr. Bates’ son. He’s got it because his dad has a copy for work use.

**Delaney Peters:** Technically, he shouldn’t have a copy anywhere but on his desktop computer in his office. Just write the ticket up saying it’s his office computer so it looks OK.

Feedback: Like the last one, this conversation is also in violation of the organizational communications policy as it does not reflect positively on the organization. Instead it reveals wrongdoing – redistribution of licensed software without a license. Delaney’s advice to Mason on getting around the company rules also reflects negatively, rather than positively, on the organization.

Example 3: An IM conversation between students working at a concert venue.

**Julian Knudsen:** Hey did you see Beyonce is coming?

**Lucy Bailey:** Yeah – sweet.

**Julian Knudsen:** I know we’re not supposed to, but I’m thinking I might grab one of the staff shirts and put myself on the schedule to work the concert.

**Lucy Bailey:** Oh, I did that when J-Lo was here.

Feedback: This conversation is also in violation of the organizational communications policy. Lucy is confessing to unethical behavior, and Julian is considering breaking the rules himself. Both actions reflect negatively, not positively, on the organization.

**Measurement**

Measures consist of hazard communications, denials, and communications volume, each gleaned from interviews; standard applied items; and a short self-focus
scale. In addition, items to confirm the success of each manipulation are collected as is a control measure.

**Study variables**

Study variables include communications dependent variables measured from instant messaging session transcripts and an original scale providing a subjective estimation of the standards applied.

**Communications variables**

The communications dependent variables were obtained in the chat session interviews, which were coded into six hazard communications categories, a neutral beliefs category, and eight denials categories. The unit of analysis is the text entry delineated by hitting enter, or a single sentence as noted by concluding punctuation, whichever is shorter. This statement definition rule was used to enable more meaningful comparisons between “rapid fire” instant messaging statements, which are typically conversational and may not be composed into complete sentences, and longer compositions, sometimes consisting of complete paragraphs. Where samples are given in this document, a forward slash (/) indicates that a communication was broken into a separate text entry by the subject at the marked point.

The highest intensity hazard communications are negative self-disclosure communications that incriminate the person conveying them. These may also be considered confessional communications. Moderate intensity hazard communications are reports of observed incriminating behaviors. Language indicating the subject witnessed an incriminating act characterizes communications in this category. Modest intensity hazard communications are relayed reports of information that incriminates others, and
are also known as hearsay. These communications refer to incriminating behaviors overheard or otherwise reported by others for which the subject has no first hand knowledge. At each level of intensity, general or specific labels were applied to indicate whether a particular incriminating incident was being described or less incriminating broad statements were offered.

Related to hazard communications are denials of knowledge of incriminating information. Hard denials are subdivided into four categories: denials that one has participated in incriminating activity, witnessed incriminating activity, or heard about incriminating activity occurring; or general denial statements that don’t fit into the other categories. Based on pilot study observations, soft denials were added to the taxonomy. These are speculative statements that imply the writer has no personal knowledge of hazards. They may be prefaced with, “I would guess that,” or “Maybe they”. The personal impropriety, seeing others’ experience, heard about others’ experience, and general denial categories also apply to soft denials.

In addition to hazard communication statements and associated denials, a neutral beliefs category was also coded. Beliefs are informative, non-procedural statements that do not fall into the incriminating hazard communications or denial categories. This category specifically excludes conversational elements that do not convey information about the topic of the conversation.

Examples of each of these categories within the study context are provided in chapter 4. Appendix 1 provides the coding scheme.
Standards applied

Because there are no existing scales for the standards applied construct, original items for this construct were created, based on prior research on standard selection (reviewed in Chapter 2). Immediately following instant messaging communications data collection, subjects were asked to assess to what extent their own standards and organizational standards governed their behavior during the instant messaging session with six original items. They provide three alternative wordings describing application of personal or organizational standards to the communications domain, such as, “How much did complying with organizational rules for electronic communications affect what you said in the instant message interview?” and “How important was it to stick to your own views on what it’s OK to talk about when being interviewed over IM?” The items were ordered so that odd items applied to organizational standards and even numbered items applied to personal standards. For each of the items, a 7 point scale with end points “Not at all” and “A great extent” was used. The items are provided in appendix 2.

Control variable

A review of decades of literature and dozens of studies has concluded that self-focused attention generally has a positive effect on the validity of self-reports, increasing correlations with direct measures by up to 0.3 or 0.4 points (Gibbons 1983). This “verdicality hypothesis” applies to self-reports of attitudes, cognitions and affective states. In the pilot study, subjects in the monitoring and non-monitoring conditions expressed similar motivations for their behavior, similar levels of attention towards who might see transcripts of their instant messages, and similar beliefs that a monitor would
have no effect on their communications behavior. However, knowledge of monitoring
clearly did have an effect on their behavior.

Given these observations and a desire to understand the standards applied, which
are thought to motivate communications behavior, we use a self-focus scale to control for
this source of variation (Matheson et al. 1988). Its four self-focus items are scored on
seven point scales anchored by the end points “extremely uncharacteristic of me,” and
“extremely characteristic of me”. The items were adapted slightly to the context,
replacing the word “experiment” with “IM discussion,” and by referring to a potential
monitor in the fourth item. (The fourth item is worded generically so that it applies to
both monitored and unmonitored treatment conditions.) The items are provided in
appendix 3.

The first two scale items are said to measure private self-focus and have been
reported to have a nearly significant correlation of \( r = 0.17 \) (\( p < 0.11 \)). The second item had
been reverse worded, but was changed to affirmative wording in case confusing wording
was responsible for the weak correlation. The second pair of items, said to measure
public self focus, had a significant correlation of \( r = 0.41 \) (\( p < 0.01 \)) in a previous study. As
discussed in chapter 2, the distinction between public and private self-focus is not
universally accepted, and is disbelieved by the researcher. Only the scale total was
employed.

**Manipulation checks**

An open ended item assessed the success of the monitoring manipulation: “To the
best of your recollection, who will receive transcripts from the interview you just
completed?” Responses to this open-ended question were compared to the treatment condition for scoring. Scoring details and an assessment are provided in chapter 4.

The organizational standard training manipulation is tested with three yes or no items. The items are written to seem rather innocuous but they refer to incidents described during training which were said to violate the organizational communication policy. The prompt asks, “From what you remember,” to discourage personal views on what the policy should be by people who were exposed to the standard. Answering no to all three prompts provides an indication that the standard was learned. The items are provided in appendix 4 and assessed in chapter 4.

**Experimental procedure**

Upper level undergraduate students were recruited by their professors, who circulated a sign-up sheet in class and offered a small extra credit incentive. The sign-up sheet also provided details of a drawing for iPods that was open to study participants. To express interest in participating, subjects chose an available interview time slot from the schedule and provided their names and email addresses for study information and reminder notices. They also completed an informed consent form. In the signature block, they were asked to provide a seven digit ID code, memorable to them, but likely to be unique, for survey login. Subjects’ login IDs were enabled and they were asked by e-mail to complete an online survey ten days prior to their scheduled interview.

The survey URL in the e-mail varied according to organizational standard condition, with treatment conditions assigned based on a random number column in a spreadsheet. Demographics and measures for future investigations were collected on this initial survey, and for subjects in the organizational standard condition, the organizational
standard was presented and training provided at the end of the survey. This activity took place on average nine days prior to the experiment.

On the day of the interview, subjects scheduled for that day were randomly assigned within organizational standard condition to monitoring or non-monitoring conditions to maintain a roughly balanced 2 x 2 design. The assignment could not practically be done prior to the day of interview given continuing recruitment and rescheduling of existing appointments.

**Instant messaging discussion**

The IM system selected for the experiment is one component of the larger Elluminate Live! Academic Edition 7.0 system. In addition to mimicking organizational instant messaging systems, the Elluminate IM system enables the monitoring manipulation described previously and provides the ability to push survey web pages to subjects.

Subjects logged onto the system at their appointment time using their first and last names. Using full names was ostensibly to ensure they were credited with participation. It also ensured consistency with typical organizational use of instant messaging which identifies users by their full names, and provided a constant reminder that the sessions were not anonymous as in typical organizational settings. In fact, subjects’ full names remained on screen at all times during the session.

To begin the interaction, subjects were told that the data collected was for a student group project. Next a survey website asking subjects to assess the seriousness of various types of cheating was pushed to the subjects, causing the survey to open in a separate browser window on their computers. The survey was created by the Center for Academic
Integrity ("Center for Academic Integrity Assessment" 2005) and is used for university academic honesty audits. The survey served to prime the topics that would be discussed in the interview.

Next subjects were interviewed through instant messaging by one of two interviewers. The researcher served as one interviewer. The second interviewer is an academic who is experienced in large scale interview-driven research projects and has completed coursework in interviewing as a research method. Training was a four step process consisting of 1) a description of the process, and provision of an interview guide developed during the pilot study with software procedures and the interview script; 2) observing the researcher conduct several interviews and asking questions about the procedures, 3) conducting several interviews as the researcher looked on and provided guidance, and finally 4) conducting interviews without observation but with live access to the researcher to ask questions. Most questions related to appropriate use of follow-up prompts. The researcher reviewed several transcripts from the second interviewer over the course of several weeks to ensure the two interviewers remained synchronized in their interviewing technique. No problems were detected.

Aiding maintenance of synchronization between interviewers was the use of scripted discussion prompts that raised topics related to academic dishonesty on the campus in question, but did not overtly ask for examples of incidents of cheating. The list of interview prompts is provided in Figure 6.
<table>
<thead>
<tr>
<th>Prompt</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you think cheating is a major problem on this campus?</td>
<td>a. If yes: Why? What problems do you think cheating causes?</td>
</tr>
<tr>
<td></td>
<td>b. If no: Why not?</td>
</tr>
<tr>
<td>2. How much cheating goes on in your classes?</td>
<td>a. How much cheating have you seen?</td>
</tr>
<tr>
<td></td>
<td>b. How much cheating have you heard about?</td>
</tr>
<tr>
<td></td>
<td>c. Is there anything you’ve done that someone might consider cheating?</td>
</tr>
<tr>
<td>5. Are some methods of cheating less successful than others?</td>
<td>a. If yes: Which ones? Why?</td>
</tr>
<tr>
<td>6. Are certain classes more likely to having cheating activity?</td>
<td>a. If yes: Which ones?</td>
</tr>
<tr>
<td></td>
<td>b. If yes: What makes a class more likely to have cheating going on?</td>
</tr>
<tr>
<td>7. Is cheating a group activity or something people do alone?</td>
<td>a. Why do you think so?</td>
</tr>
<tr>
<td>8. Why do people cheat?</td>
<td></td>
</tr>
<tr>
<td>9. Are certain types of people more likely to cheat?</td>
<td>a. If yes: Why?</td>
</tr>
<tr>
<td></td>
<td>b. If yes: In what ways?</td>
</tr>
<tr>
<td>10. In a course, what types of activities are more likely to be cheated on?</td>
<td>a. Why those?</td>
</tr>
</tbody>
</table>

**Figure 6. Instant messaging interview prompts**

Following completion of the IM interview, another website was pushed to subjects to collect self-focus and perceived organizational standards influence measures, to conduct manipulation checks for each of the two manipulations, and to collect measures for a future study.

**Pilot test findings**

The pilot study differed somewhat from the larger study. The main methodological difference was that while the monitoring impacts of primary interest were
hypothesized and measured, no organizational standard manipulation was employed. Improvements based on pilot test results are summarized at the conclusion of this section.

The pilot test included 40 subjects. Three subjects who were substantially dissimilar from the remainder of the sample were removed. One was based at a different campus than all of the others, and two were in their mid-thirties, as compared with the median age of 24. Of the older subjects, one was a first semester transfer student. All three of these subjects were noteworthy for their stated inability to answer most questions, providing frequent responses of “I don’t know,” “Not really sure,” and “No idea.” Two of these were in the control group, and one in the treatment group, leaving 18 in the control group and 19 in the treatment group.

For the pilot test, two raters (neither of whom served as coders for the main experiment) coded the interviews into specific high intensity, moderate intensity, modest intensity, and denials categories, as follows.

The highest intensity hazard communications are negative self-disclosure communications that incriminate the person conveying them. These may also be considered confessional communications. In this context, a negative self-disclosure is subject’s description of his or her own cheating behavior, such as, “In my organizations and systems class two years ago, my friend and I didn't understand the work and some guys thought we were cute ladies and helped us with every assignment.”

Moderate intensity hazard communications are reports of observed incriminating behaviors. Language indicating the subject observed the cheating behavior described characterizes communications in this category. Samples include, “i used to be in a frat they had old test and the convinence of cheating was there and available and i saw that
some probably 7-15 percent would,” and “last week two friends of mine got together to complete the tests.”

Modest intensity hazard communications are relayed reports of information that incriminates others, and are also known as hearsay. In a cheating context, hearsay statements are characterized by language that the subject heard about the behavior in question occurring. Samples include, “my roommates were talking about it earlier this semester. / they are all taking internet classes and have used the discussion boards to cheat,” and “ive heard of friends paying others to write them for them if they just dont write very well or dont have the time - or basically just dont want to.”

Denials are statements that the subject did not or has not participated in, seen or heard about academic dishonesty, for example, “In my 4 years here, I have never seen any cheating going on in my classes.”

Within each of these categories, where multiple statements referred to the same incident, common incident numbers were applied.

A spreadsheet-based tool was developed for this pilot study coding task (Holton 2006), and improved to support the increased granularity in the main experiment. Several features were included to encourage coding precision and accuracy. Construct definitions were constantly at the top of the screen for reference. Statements were tallied automatically from the codes assigned, with an area provided to keep running tallies of manually applied incident numbers. Known or suspected coding errors like incident counts that exceeded statement counts for a particular statement type were highlighted by logic checking formulas. These did not constrain the coders’ discretion, but encouraged
review of codes to reveal errors. They were particularly helpful in identifying incorrect assignment of incident numbers within a given statement type.

Initially, four IM transcripts were coded by a single rater, and the ratings were reviewed with a second rater. The two coders were in complete agreement on the codes applied to this small sample. Next, the coders independently coded the remaining transcripts, consulting each other to further refine their understanding of construct definitions when close calls were encountered. Finally, 25 percent of the data for which agreement was not previously determined was coded by each rater.

Within three hazard communications categories (negative self-disclosure incident statements, specific, observed incident statements, hearsay of a specific incident statements) and the specific denials category, acceptable interrater reliability was achieved (Spearman correlation= 0.996, p=0.000), with perfect agreement in three of the four classifications.

Additional general hazard communications and soft denials were assessed in the larger study, along with neutral beliefs statements. These are described in chapter 4.

The normality of each variable was considered was considered with histograms and the Kolmogorov-Smirnov test. Both revealed that while denials were approximately normally distributed, each category of hazard communications has left skew and a long right tail. Levene’s test of equality of variances was also assessed, with approximately equal variances found for most dependent variables except negative self-disclosures. When only two groups are compared, in this case monitored and non-monitored, the MANOVA analysis to be undertaken is robust with respect to each of these characteristics.
Descriptive statistics for each variable, both overall and within treatment condition, are provided in table 1.
Table 1. Pilot Study Descriptive Statistics Overall and by Treatment Condition

<table>
<thead>
<tr>
<th>Statement dependent variables</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative self-disclosure incident statements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-monitored</td>
<td>18</td>
<td>1.17</td>
<td>2.09</td>
<td>0</td>
<td>6</td>
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<tr>
<td>Monitored</td>
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<td>0.16</td>
<td>0.69</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
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<td>0.65</td>
<td>1.60</td>
<td>0</td>
<td>6</td>
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<tr>
<td>Specific, observed incident statements</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-monitored</td>
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<td>1.56</td>
<td>2.55</td>
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<td>4.09</td>
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<td>3.38</td>
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<td>16</td>
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<tr>
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<td></td>
<td></td>
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<tr>
<td>Non-monitored</td>
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<td>0.00</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Monitored</td>
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<td>0.89</td>
<td>1.70</td>
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<td>Total</td>
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<td>1.28</td>
<td>0</td>
<td>6</td>
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<tr>
<td>Hard specific denial statements</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Non-monitored</td>
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<td>1.71</td>
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<td>1.45</td>
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<td>7</td>
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<tr>
<td>Total</td>
<td>37</td>
<td>3.03</td>
<td>1.71</td>
<td>0</td>
<td>7</td>
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<table>
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<tr>
<th>Incident dependent variables</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
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</thead>
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<tr>
<td>Negative self-disclosure incidents</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Non-monitored</td>
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<td>0.44</td>
<td>0.86</td>
<td>0</td>
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<td>Monitored</td>
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<td>0.05</td>
<td>0.23</td>
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<td>0</td>
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<tr>
<td>Total</td>
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<td>0.24</td>
<td>0.64</td>
<td>0</td>
<td>3</td>
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<tr>
<td>Specific, observed incidents</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Non-monitored</td>
<td>18</td>
<td>0.50</td>
<td>0.79</td>
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<tr>
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<td>19</td>
<td>0.37</td>
<td>0.68</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>0.43</td>
<td>0.73</td>
<td>0</td>
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<tr>
<td>Heresay of a specific incidents</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Non-monitored</td>
<td>18</td>
<td>0.00</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Monitored</td>
<td>19</td>
<td>0.37</td>
<td>0.60</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>0.19</td>
<td>0.46</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Hard specific denial incidents</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-monitored</td>
<td>18</td>
<td>2.22</td>
<td>1.63</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Monitored</td>
<td>19</td>
<td>3.26</td>
<td>3.26</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>2.76</td>
<td>1.48</td>
<td>0</td>
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</table>
Each hypothesis was assessed in two ways: through statistical comparison of
treatment and control group differences in the numbers of hazard communication
incidents of each type, and the numbers of statements of each type volunteered by
subjects. Separate MANOVAs are appropriate given the high correlations between
incidents and statements ($r = 0.74-0.91$), making it statistically redundant to include both
in the same model. We note, however, that results were sufficiently strong to produce a
significant combined MANOVA as well as individual MANOVAs on incidents ($F=4.181,$
p=0.008 for each of four MANOVA statistics tested) and statements ($F=3.767,$ p=0.013).

H2 proposes that organizational members make fewer higher intensity hazard
communications under organizational CMC monitoring than on unmonitored channels.
This hypothesis is supported by a finding for both negative self-disclosure incidents
($F=3.71,$ p=0.06) and statements ($F=3.97,$ p=0.05). On average, one out of every two
non-monitored subjects (mean of 0.44 incidents per non-monitored subject) volunteered
several statements with specific, personally incriminating information about their past,
current or planned academic dishonesty. In contrast, there was a single case of a
monitored subject making this type of hazard communication.

H3 posits that the decrease in the frequency of high intensity hazard
communications between monitored and non-monitored conditions is greater than the
change in frequency for low intensity hazard communications. While there will be no
one universally accepted standard for the degree of hazard of a particular communication,
we implemented a simple scoring algorithm to determine an overall hazard intensity
score for the communications of each subject to assess H3. For the initial assessment,
confessional incidents, which could potentially bring not just shame and disapproval but
immediate penalty without further corroboration or investigation, received a score of twenty. Given their post hoc, uncorroborated nature, which the organization and the individual can at least partially combat with equal and opposite statements, reported observation hazard communications received a score of five. On this scale, relayed incident hazard communications received a score of one. Using this initial scoring scheme, differences in hazard communications intensity were found to be significant for hazard communications incidents (F=4.37, p=0.04), but not for statements (F=2.06, p=0.16). As the relative weights are adjusted to give additional gravity to the most severe confessional hazard communications, findings become more significant. For instance, with a weighting scheme of 50, 5 and 1 for confessional, observed, and relayed hazard communications, respectively, the hazard intensity difference appears more significant (F=4.89, p=0.03 for incidents, and F=3.18, p=0.08 for statements). However, as the scale is adjusted the other way, giving more equal subjective weightings of 3, 2 and 1 to the three intensities of hazard communications, findings become non-significant for both incidents (F=2.11, p=0.16) and statements (F=0.32, p=0.58). Although this analysis is necessarily subjective, we conclude that when monitored by an organizational authority, individuals do reduce the intensity of hazard communications in which they engage.

The final hypothesis assessed with pilot study data, H4, suggests that when monitored by an organizational authority, individuals will make more denials of knowledge of incriminating behaviors. This hypothesis was tested with separate ANOVAs for incidents and statements. Both were significant (F=5.10, p=0.03 for incidents, and F=6.70, p=0.01 for statements), providing support for this hypothesis. Pilot test results are reported in table 2.
Table 2. Pilot Test Results

<table>
<thead>
<tr>
<th>Statement dependent variables</th>
<th>Type III Sum</th>
<th>Mean Sq</th>
<th>F</th>
<th>Sig.</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative self-disclosure incident statements</td>
<td>9.406</td>
<td>9.406</td>
<td>3.965</td>
<td>0.054</td>
<td>.102</td>
</tr>
<tr>
<td>Specific, observed incident statements</td>
<td>0.506</td>
<td>0.506</td>
<td>0.043</td>
<td>0.837</td>
<td>.001</td>
</tr>
<tr>
<td>Hearsay of a specific incident statements</td>
<td>7.400</td>
<td>7.400</td>
<td>5.001</td>
<td>0.032</td>
<td>.125</td>
</tr>
<tr>
<td>Hard specific denial statements</td>
<td>16.868</td>
<td>16.868</td>
<td>6.701</td>
<td>0.014</td>
<td>.161</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incident dependent variables</th>
<th>Type III Sum</th>
<th>Mean Sq</th>
<th>F</th>
<th>Sig.</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative self-disclosure incidents</td>
<td>1.419</td>
<td>1.419</td>
<td>3.709</td>
<td>0.062</td>
<td>.096</td>
</tr>
<tr>
<td>Specific, observed incidents</td>
<td>0.160</td>
<td>0.160</td>
<td>0.296</td>
<td>0.590</td>
<td>.008</td>
</tr>
<tr>
<td>Hearsay incidents</td>
<td>1.255</td>
<td>1.255</td>
<td>6.839</td>
<td>0.013</td>
<td>.163</td>
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<tr>
<td>Hard specific denial incidents</td>
<td>10.015</td>
<td>10.015</td>
<td>5.095</td>
<td>0.030</td>
<td>.127</td>
</tr>
</tbody>
</table>

Findings on all hypotheses tested indicate sufficient power with a sample size of n=37. As the main study would introduce a new organizational training standard contrast, the target sample size was increased to 80.

Summary of changes between pilot and main studies

The following changes were made in the main study as compared with the pilot study. The monitoring manipulation was strengthened with notice called to the recording indicator. Additional data was collected and analyzed including general hazard communications and denials that did not meet the specificity threshold applied for the data recorded in this chapter; soft denials, which provide an additional way to avoid engaging in hazard communications; neutral belief statements; and volume measures including time spent in the interview portion of the online session, total text entries, and total word count. Based on these new categories, additional coding guidelines were
developed. Finally, spreadsheet intelligence was improved to support coding accuracy.

Each of these changes is described in chapter 4.
Chapter 4

Results

The pilot study was repeated on a larger scale, producing support for all hypotheses. This chapter provides a report on the suitability of the collected measures for hypothesis testing, followed by hypothesis tests of the relationships between them and post hoc analysis.

Assessing variable adequacy

Demographics

Subjects in the main study were on average 24 years old and reported an average of 7 years of work experience (with a range of 0-35 years). 93 percent of subjects reported that they were from the United States, with one each listing Albania, Canada, Colombia, Guatemala, Haiti, and Panama as their home country. They reported an average GPA of 3.1 on a four point scale. Twelve subjects reported that the study provided their first experience using instant messaging, while they had an average of 6.5 years of experience with the technology. Other demographics are reported in table 3.
Table 3. Demographics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
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<tr>
<td>Age</td>
<td>85</td>
<td>18</td>
<td>55</td>
<td>24.1</td>
<td>6.3</td>
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<tr>
<td>Years work experience</td>
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<tr>
<td>Years IM experience</td>
<td>86</td>
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<td>15</td>
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<td>4.1</td>
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<td>Self-reported GPA</td>
<td>84</td>
<td>2.00</td>
<td>3.95</td>
<td>3.13</td>
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<table>
<thead>
<tr>
<th></th>
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<th>%</th>
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<tr>
<td>Sophomore</td>
<td>3</td>
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<td>Main</td>
<td>82</td>
<td>96</td>
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<tr>
<td>Junior</td>
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<td>14</td>
<td>campus</td>
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<td>4</td>
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<tr>
<td>Senior</td>
<td>69</td>
<td>81</td>
<td>Regional</td>
<td>85</td>
<td>100</td>
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<td>Grad</td>
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<tr>
<td>Total</td>
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</tbody>
</table>

One hundred three subjects completed the pre-test, with 86 of those completing the interview (83.5 percent). Of the 17 subjects lost to attrition, 59 percent were from the United States with one each from Belize, Brazil, Canada, the Dominican Republic, Haiti, India, and Jamaica, making this group less homogeneous in country of origin than the experimental group, but still largely from the U.S., with all but one other subject from other parts of North and South America like those completing the study. In other respects, this group was extremely similar to the group completing the experiment with an average self-reported GPA of 3.1, an average age of 24, and an average of 6.7 years of experience using instant messaging. All were from the main campus, and 82 percent were seniors. (Years work experience was collected in a post test and therefore is not available for the attrition group.) A MANOVA predicting the quantitative demographics from whether or not a subject completed the study was non-significant (F = 0.235, p = 0.946). Thus the sample is from the same geographic region as the attrition group but more homogeneous
in country of origin, and in other respects, the groups appear extremely similar. Based on the available data, no reason is found to suspect attrition biased the sample.

**Communications variables**

The same three hazard communications categories applied in the pilot study were used in the main study, but an additional level of granularity was considered, consistent with the taxonomy presented in chapter 2: At each level of intensity, coders were directed to label communications as general or specific (whereas only specific statements were considered in the pilot study). A general statement is sweeping with no hooks to isolate a particular incident of cheating, such as “people just copy and paste from spark notes,” and “People use other students’ papers for classes. / and simply re-submit them as their own.” A specific statement is one that, if we had full details, could be tied back to a place, time, and person or people. Specific codes were applied when the behavior was described as a discrete incident or incidents (“people programmed formulas into their calculators,” “Was a witness to it last week”). The existence of discrete incidents was often made clear by indicators of quantity (“one time,” “a couple of times”), details about the subject or course (e.g. “large math classes,” “managerial accounting”), or by naming particular perpetrators (“my friend,” “my roommate”).

To provide additional understanding of the effect predicted in H4, hard denials of knowledge of incriminating information were subdivided into four categories: general (e.g. “As far as I know, cheating isn’t a problem here”), personal impropriety (e.g. “I have never been involved with any situation that cheating has been an issue on campus”), observed (“I’ve never seen someone cheat on a test”), and heard about (“I have never heard about anyone cheating in any of my classes so far”).
Based on pilot study observations of an additional type of hazard communications avoidance, a soft denials category was added to the taxonomy. Soft denials are speculative statements that imply the writer has no personal knowledge of hazards but avoid saying so directly. They may be prefaced with, “I would guess that,” or “Maybe they”. Raters were asked to code soft denials into the same categories used for hard denials: general, personal impropriety, observed, and heard about. Special coding guidance was given for a potential close call. Statements similar to, “I don’t know besides what I already told you,” were not coded as denials as long as some other comment referred to in a statement like this one did address the question asked. However, if a subject deflected a question with a comment of this nature and no other comment did address the question, such a statement was coded as a hard denial.

In addition to hazard communication statements and associated denials, a neutral beliefs category was coded to test H5. Beliefs are statements informative about the topic at hand but which do not provide incriminating information. This category excludes procedural statements as non-informative. Examples include, “its easy to obtain the answers from other students who have previously taken the course,” and “looking at someones test paer is easy and less likleyto be cought than forging a paper.”

To prepare the data for coders, the instant messaging transcripts were anonymized, stripped of initial procedural discussion including indicators of treatment condition, and parsed before being pasted into spreadsheets, one conversation per worksheet, and one line per IM statement (as delineated by the send command). Separate columns recorded the date, time, message author, and message content. Up to six code pairs, one item for the statement type and one for the hazard incident or denial incident number could be
applied by default, and coders were asked to carry any additional codes into free cells in other rows, annotating this practice in the comments field if used.

The coding worksheet developed for the pilot study was augmented with the additional categories. Prototypical statements and other coding guidance were also added in rollover pop-up boxes to reinforce the definitions and encourage consistency between raters.

Two experienced behavioral research coders unfamiliar with study hypotheses and manipulation procedures, and blind to treatment condition were hired. They were not involved in any other portion of the study. In recognition that this is a difficult coding task, extensive training was undertaken. Initial training of coders consisted of walking through a coding guidance document explaining construct definitions and examples. Next use of the coding worksheet, including features to promote coding accuracy, was explained. Subsequently each coder rated part of an interview in discussion with the trainer. Finally, each of the first ten interviews coded by each rater was reviewed by the trainer with feedback provided. At the conclusion of this process, both raters and trainer agreed that application of the coding categories was well understood by the raters.

Following training, periodic checks were made of selected coded interviews, with coaching provided where deficiencies or inconsistencies between coders were found. Coders were not asked to change ratings, but rather to consider suspect ratings in light of apparent discrepancies with the construct definitions or disagreements between themselves. They were asked to explain their reasoning where they felt questioned ratings were accurate.
A number of interrater reliability measures were considered. Since the determination of what constitutes a statement is itself an issue for coder judgment, the interview was the unit of analysis for determination of interrater reliability, the same unit of analysis used for hypothesis testing. Cohen’s Kappa, perhaps the most common measure of interrater reliability, is insufficient for assessing this activity since it considers that the data are assigned to mutually exclusive categories. In this case, statements may be assigned to multiple categories (for instance because they contain a description of cheating and a belief that “justifies” the practice), and the codes for an interview are compared across the categories. Pearson correlations are sometimes chosen to assess interrater reliability in this case as they are easily understood, but they suffer from the limitation that they rely on normally distributed data. From the sample of 86 interviews, we find zero skew in some categories as well as long high end tails. Intraclass correlations, another popular choice, also assume normality. Spearman correlations are free from this assumption. For sake of comparison, all three of these measures, Pearson, Spearman, and intraclass correlations, are reported by ratings category in table 4. Results by interview are given in table 5.

High levels of agreement among the coders in all but one category give confidence both in the ratings and that the constructs are distinct and well defined. The final category is one for which one coder found three examples across the 86 interviews, while none were identified by the other coder. As there were no findings associated with this variable, soft denials of seeing others’ experience, it is not further considered.
Table 4. Interrater Reliability Correlation Assessment

<table>
<thead>
<tr>
<th>Category</th>
<th>Pearson*</th>
<th>Spearman*</th>
<th>Intraclass*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative self-disclosure incident statements</td>
<td>0.9421</td>
<td>0.9176</td>
<td>0.9701</td>
</tr>
<tr>
<td>Neg. self-disclosures unrelated to single incident</td>
<td>0.8498</td>
<td>0.7662</td>
<td>0.9161</td>
</tr>
<tr>
<td>Specific, observed incident statements</td>
<td>0.8825</td>
<td>0.7855</td>
<td>0.9326</td>
</tr>
<tr>
<td>Reported obs. not related to single incident</td>
<td>0.9620</td>
<td>0.8711</td>
<td>0.9806</td>
</tr>
<tr>
<td>Heresay of a specific incident</td>
<td>0.9199</td>
<td>0.7986</td>
<td>0.9580</td>
</tr>
<tr>
<td>Heresay not related to a specific incident</td>
<td>0.9081</td>
<td>0.7674</td>
<td>0.9498</td>
</tr>
<tr>
<td>Beliefs expressed</td>
<td>0.8530</td>
<td>0.8218</td>
<td>0.9192</td>
</tr>
<tr>
<td>Hard denials in general</td>
<td>0.7613</td>
<td>0.6422</td>
<td>0.8644</td>
</tr>
<tr>
<td>Soft denials in general</td>
<td>0.7959</td>
<td>0.7573</td>
<td>0.8846</td>
</tr>
<tr>
<td>Hard denials of personal impropriety</td>
<td>0.9032</td>
<td>0.8791</td>
<td>0.9029</td>
</tr>
<tr>
<td>Soft denials of personal impropriety</td>
<td>0.8082</td>
<td>0.7889</td>
<td>0.8082</td>
</tr>
<tr>
<td>Hard denials of seeing others' experience</td>
<td>0.8508</td>
<td>0.8508</td>
<td>0.8507</td>
</tr>
<tr>
<td>Soft denials of seeing others' experience</td>
<td>-0.0852</td>
<td>-0.1085</td>
<td>**</td>
</tr>
<tr>
<td>Hard denials of hearing about others' experience</td>
<td>0.7986</td>
<td>0.7641</td>
<td>0.8848</td>
</tr>
<tr>
<td>Soft denials of hearing about others' experience</td>
<td>1.0000</td>
<td>1.0000</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

*Except for soft denials of seeing others' experience, p values for each statistic are 0 out to at least 10 significant digits.

** Incalculable due to zero variance in the sample from the rater not applying this code.
Table 5. Pearson Correlations Between Ratings Arrays by Interview

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.995</td>
<td>30</td>
<td>0.970</td>
<td>59</td>
<td>0.952</td>
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<td>2</td>
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</tr>
<tr>
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<td>0.995</td>
<td>63</td>
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<tr>
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<td>64</td>
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<td>0.986</td>
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<td>0.995</td>
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<tr>
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<td>66</td>
<td>0.995</td>
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<td>67</td>
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<tr>
<td>10</td>
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<td>11</td>
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<td>0.985</td>
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<tr>
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<td>70</td>
<td>0.991</td>
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<tr>
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<td>0.970</td>
<td>71</td>
<td>0.996</td>
</tr>
<tr>
<td>14</td>
<td>0.998</td>
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<tr>
<td>15</td>
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<td>73</td>
<td>0.981</td>
</tr>
<tr>
<td>16</td>
<td>0.989</td>
<td>45</td>
<td>0.993</td>
<td>74</td>
<td>0.957</td>
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<tr>
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<td>46</td>
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<tr>
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<td>0.991</td>
<td>76</td>
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<tr>
<td>19</td>
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<td>48</td>
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<td>77</td>
<td>0.999</td>
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<td>20</td>
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<td>0.992</td>
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<td>0.978</td>
<td>82</td>
<td>0.997</td>
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<td>25</td>
<td>0.995</td>
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<td>0.938</td>
<td>83</td>
<td>0.999</td>
</tr>
<tr>
<td>26</td>
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<td>0.988</td>
<td>84</td>
<td>0.974</td>
</tr>
<tr>
<td>27</td>
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<td>85</td>
<td>0.977</td>
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<td>28</td>
<td>0.991</td>
<td>57</td>
<td>0.968</td>
<td>86</td>
<td>0.990</td>
</tr>
<tr>
<td>29</td>
<td>0.995</td>
<td>58</td>
<td>0.992</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Twenty percent of the data was reviewed with the coders with alignment sought for this subset. One of the two coders was found to be better than the other at making fine construct distinctions from context, while the second relied more legalistically on the use of certain terms to determine categorizations. For instance, an opinion prefaced with
“I guess I’d say,” can indicate lack of knowledge (which should be coded as a soft denial) or a judgment based on facts (which should be coded as a belief). This determination is best made after considering other statements by the subject in the chat session. The weaker coder typically coded such statements as soft denials even after coaching, while the stronger coder annotated determinations with evidence from elsewhere in the transcript to support a belief interpretation where appropriate. The weaker coder was able to support belief interpretations when asked to consider that code, but rarely spotted them without prompting.

After completion of the coding review for 17 interviews (20 percent), the stronger coder’s ratings were judged by the trainer to be consistently correct, or in the case of close calls, well-defended. Relatively few discrepancies between coders were found. When discrepancies were returned to coders for review, the stronger coder sometimes more fully explained coding decisions but was justifiably reluctant to change them, while the weaker coder typically changed ratings without discussion. For that reason, and given limitations on budget and time, once it was determined that interrater reliability was satisfactory, the coding review was suspended and determinations of the coder who more fully considered statements with their context in each discussion were selected for additional analysis.

In addition to the interview content variables, the dependent variables collected from the instant messaging sessions included length in minutes of the interview portion of each online session (which was the only data provided to the coders) as captured by the chat software and calculated on the interview spreadsheet; the total number of text entries (delineated by returns), tallied automatically on the interview spreadsheet; and
total word count of each interview, which was also tallied automatically in the coding workbook. Lengths of two interviews for which time stamps were not captured by the chat system (once due to a system problem, and once due to interviewer error) were estimated from the timestamps on surveys the subjects took immediately before and after those interviews along with average completion times for interview preliminaries and the second survey. Descriptive statistics for all variables resulting from the interviews follow in table 6.
Table 6. Communications Statement, Volume, and Incident Descriptive Statistics

<table>
<thead>
<tr>
<th>Statements</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative self-disclosure incident statements</td>
<td>86</td>
<td>0</td>
<td>11</td>
<td>1.05</td>
<td>2.20</td>
</tr>
<tr>
<td>Neg. self-disclosures unrelated to single incident</td>
<td>86</td>
<td>0</td>
<td>6</td>
<td>0.48</td>
<td>1.04</td>
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<tr>
<td>Specific, observed incident statements</td>
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<td>18</td>
<td>0.84</td>
<td>2.44</td>
</tr>
<tr>
<td>Reported obs. not related to single incident</td>
<td>86</td>
<td>0</td>
<td>43</td>
<td>4.27</td>
<td>7.65</td>
</tr>
<tr>
<td>Heresay of a specific incident</td>
<td>86</td>
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<td>36</td>
<td>1.42</td>
<td>5.16</td>
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<td>0</td>
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<td>7.80</td>
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<tr>
<td>Beliefs expressed</td>
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<td>10</td>
<td>97</td>
<td>33.66</td>
<td>12.49</td>
</tr>
<tr>
<td>Hard denials in general</td>
<td>86</td>
<td>0</td>
<td>8</td>
<td>1.80</td>
<td>1.67</td>
</tr>
<tr>
<td>Soft denials in general</td>
<td>86</td>
<td>0</td>
<td>8</td>
<td>1.99</td>
<td>1.87</td>
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<tr>
<td>Hard denials of personal impropriety</td>
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<td>0</td>
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<td>1.14</td>
<td>1.52</td>
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<td>Soft denials of personal impropriety</td>
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<td>1.47</td>
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<tr>
<td>Hard denials of seeing others' experience</td>
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<td>0</td>
<td>10</td>
<td>1.37</td>
<td>1.66</td>
</tr>
<tr>
<td>Soft denials of seeing others' experience</td>
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<td>0.01</td>
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</tr>
<tr>
<td>Hard denials of hearing about others' experience</td>
<td>86</td>
<td>0</td>
<td>8</td>
<td>0.97</td>
<td>1.20</td>
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<table>
<thead>
<tr>
<th>Volume</th>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
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<td>2937</td>
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<td>355.02</td>
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<td>Text entries</td>
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<td>45</td>
<td>167</td>
<td>71.31</td>
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<td>Minutes</td>
<td>86</td>
<td>16.1</td>
<td>89.4</td>
<td>35.7</td>
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</table>

<table>
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<th>Incidents</th>
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<th></th>
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<td>Specific negative self-disclosure incidents</td>
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<td>4</td>
<td>0.407</td>
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<td>General self-disclosures</td>
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<td>2</td>
<td>0.419</td>
<td>0.563</td>
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<tr>
<td>Specific, observed incidents</td>
<td>86</td>
<td>0</td>
<td>4</td>
<td>0.384</td>
<td>0.738</td>
</tr>
<tr>
<td>General reported observations</td>
<td>86</td>
<td>0</td>
<td>20</td>
<td>1.942</td>
<td>3.019</td>
</tr>
<tr>
<td>Specific hearsay incidents</td>
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<td>0</td>
<td>5</td>
<td>0.291</td>
<td>0.795</td>
</tr>
<tr>
<td>General reported hearsay</td>
<td>86</td>
<td>0</td>
<td>19</td>
<td>2.616</td>
<td>3.167</td>
</tr>
<tr>
<td>Beliefs expressed – distinct topics</td>
<td>86</td>
<td>8</td>
<td>54</td>
<td>18.616</td>
<td>6.149</td>
</tr>
<tr>
<td>Hard denials - general</td>
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<td>6</td>
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<td>1.370</td>
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<tr>
<td>Soft denials - general</td>
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<td>0</td>
<td>6</td>
<td>2.105</td>
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</tr>
<tr>
<td>Hard denials of personal impropriety</td>
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<td>0</td>
<td>5</td>
<td>0.872</td>
<td>0.943</td>
</tr>
<tr>
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<td>Hard denials of seeing others' experience</td>
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<td>0.108</td>
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<td>0</td>
<td>1</td>
<td>0.035</td>
<td>0.185</td>
</tr>
</tbody>
</table>

The communications belief statements, word count, text entry count and minutes variables are normally distributed as measured by non-significant Kolmogorov-Smirnov tests (which indicate we are unable to reject the normality hypothesis, with values of
General negative self-disclosure statements, specific observation statements, specific hearsay statements, belief statements, hard general denials, hard and soft denials of personal impropriety, hard denials of observation, and hard and soft hearsay denials have approximately equal variances across monitoring conditions as measured by Levene’s test of equality of error variances (with p values ranging from 0.096-0.818). Normality and equality of variance across monitoring conditions are not characteristics of the other statements dependent variables.

Communications incident counts are decidedly non-normal. With few exceptions, zero is the most frequent value. Kolmogorov-Smirnoff test values range from p=0.000-0.018. Many of the incident counts show approximately equal variances across monitoring conditions, including general and specific hearsay communications, beliefs, specific general denials, specific and general personal impropriety denials, specific and general observation denials, and general hearsay denials (with p values ranging from 0.068-0.905). While both normality and equality of equality of error variance are assumed by the MANCOVA analysis technique, with just two groups and large n, conforming to these assumptions is not a requirement for reliable results.

That many of the communications variables are skewed towards zero with a long right end tail is to be expected and does not reflect a measurement weakness. Many subjects will have no information to offer pertaining to some of the hazard categories, particularly during a short duration task; and under monitoring, suppression is expected. Since incidents group related statements, there will necessarily be an even more severely curtailed distribution for incident variables. Fortunately, we can rely on MANCOVA robustness for the case at hand. Even with the zero-anchored distributions, we note that
the means and ranges observed indicate that practical and predictable differences between
subjects on these variables typically exist, with statistical significance to be assessed
according to the hypotheses.

The data was also examined for the presence of outliers, a consideration which
should be made with some knowledge of the expected population distribution. In
organizational settings, whistleblowing is rare. According to the taxonomy and
experimental results, negative self-disclosure is rarer still. In one university setting, only
3 percent of surveyed students said they had ever reported cheating to an official (Burton
et al. 1995). In this study, the period for reporting was quite limited, thus many zero
values are anticipated. Further, the tendency to self-disclose has both state and trait
components (Stritzke et al. 2004), with the former suggesting high variance between
treatment conditions and the latter suggesting high variance within subjects. Once they
have decided to whistle-blow, whistleblowers are likely to be “repeat offenders” (Sawyer
et al. 2006). Together, these facts support an expectation of wide variance. The high
incidence of zero values and wide variance observed are congruent with the expected
variable distributions, thus no outliers are identified.

**Manipulation checks**

Two manipulation checks are the next basis on which eliminating data from the
sample was considered. To test the monitoring manipulation, a post test item asked, “To
the best of your recollection, who will receive transcripts from the interview you just
completed?” For the pilot test, a very narrow interpretation of responses to this item
was applied and 73 percent of subjects passed the manipulation check. In the larger
experiment, the monitoring manipulation was strengthened by asking monitored subjects
to confirm that they saw the reel to reel recorder that indicates a transcript is being made for the Office of Academic Honesty when monitoring is turned on. To score the manipulation check, subjects in the non-monitored condition not indicating a university department or office were considered passes, as were subjects in the monitored condition indicating a university official would receive copies of transcripts. Three subjects not responding to the manipulation check and three subjects giving incorrect responses were excluded on this basis, leaving 80 subjects in the study, for a manipulation success rate of 93 percent.

The organizational standard manipulation had a simpler interpretation: Every subject in the organizational standard condition correctly answered that all three of the behaviors described were prohibited under the policy that had been presented to them, indicating a successful manipulation. (The group not receiving the organizational standard included subjects who rated all three behaviors as allowed under the policy, those who judged that one or two behaviors were allowed, and those who said that all were prohibited.)

Some subjects took several days to complete the standard training after being given online access to it, shortening the standard-communications capture interval, while others rescheduled their interviews, lengthening this interval. This variation provides a means of testing not only whether standard training impacts communications with and without monitoring, but also the extent to which the recency of presentation of an organizational communications standard impacts the standard’s effects. Since the standard-communications capture interval is expected to be a more powerful predictor of communications when it is low, trending towards zero when it is high, the inverse of the
interval in days was used in initial models. This measure approached significance without crossing the threshold. A second transformation allowed for the possibility that the recency effect is underrepresented with the inverse of days measure. Additional investigations considered an inverse square transformation, $1/(\text{interval}^2)$, a variable called standard recency. Higher values of this variable indicate more recent presentation of the organizational standard. Using this measure, an interval of one week would have four times the weight of an interval of two weeks. The investigations using this variable found statistically significant results and are reported in the hypothesis tests. Descriptive statistics for standard recency appear in table 7. (This table and all subsequent tables exclude data for subjects who failed the monitoring manipulation check.)

**Table 7. Standard Recency Descriptive Statistics**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>43</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>0.0015</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>1.0000</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>0.0431</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>0.1504</td>
</tr>
</tbody>
</table>

(N is equal to approximately half of the data sample since the statistic is irrelevant for those not in the organizational standard group.)

This variable is to be applied as a covariate, so outliers may be influential. A boxplot revealed an apparently legitimate but unusual data point. The subject completed the organizational standard training one day prior to the experiment. The subject number was noted for further consideration at the time of hypothesis testing.

The cell sizes for the two conditions tested are nearly, but imperfectly equal due to attrition and exclusion on the basis of the monitoring manipulation check (table 8).
Table 8. Number of Subjects by Treatment Condition

<table>
<thead>
<tr>
<th></th>
<th>Trained on organizational standard</th>
<th>Not trained organizational standard</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitored</td>
<td>21</td>
<td>18</td>
<td>39</td>
</tr>
<tr>
<td>Unmonitored</td>
<td>22</td>
<td>19</td>
<td>41</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>37</td>
<td>80</td>
</tr>
</tbody>
</table>

Standards applied

The six items assessing the extent to which personal and organizational standards applied (described in chapter 3 and provided in the appendix) were combined to determine perceived relative influence of these standards. Items 1, 3 and 5 of the standards items, which assess personal standards influence, were summated. Separately items 2, 4 and 6, which assess organizational standards influence, were summated. Descriptive statistics for these summated scales appear in table 9. Both minimum and maximum scores were realized for each scale when subjects rated each of the three items in a scale 1 or 7. That the means of each scale were more than one standard deviation from the scale end points provides an indication that range restriction did not impair scale validity.

Table 9. Organizational and Personal Standards Influence Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Org Standards Influence</td>
<td>80</td>
<td>3</td>
<td>21</td>
<td>12.5</td>
<td>4.4</td>
</tr>
<tr>
<td>Personal Standards Influence</td>
<td>80</td>
<td>3</td>
<td>21</td>
<td>13.2</td>
<td>4.6</td>
</tr>
</tbody>
</table>

The personal influence scale had a Cronbach’s alpha of 0.662. The organizational standard influence scale had a Cronbach’s alpha of 0.657. Both are thus considered to have sufficient internal consistency reliability. These scales are used in this form only in
confirmatory factor analysis which has no distributional assumptions. Confirmatory factor analysis finds that each item loads as predicted and without crossloadings. Together these indicators provide evidence of acceptable convergent and discriminant validity. Factor loadings are provided in table 10.

Table 10. Standards Applied Factor Loadings

<table>
<thead>
<tr>
<th></th>
<th>Personal factor</th>
<th>Org factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>How important was it to stick to your own views on what it’s OK to talk about when being interviewed over IM?</td>
<td>0.828</td>
<td>-0.095</td>
</tr>
<tr>
<td>How much did your own thoughts about how to use IM to discuss various topics affect what you said during the interview?</td>
<td>0.808</td>
<td>0.275</td>
</tr>
<tr>
<td>To what extent did your own personal standards for IM communications impact the IM discussion you just had?</td>
<td>0.652</td>
<td>-0.088</td>
</tr>
<tr>
<td>To what extent did USF’s organizational standard impact the IM discussion you just had?</td>
<td>-0.098</td>
<td>0.887</td>
</tr>
<tr>
<td>How much did complying with organizational rules for electronic communications affect what you said in the instant message interview?</td>
<td>-0.109</td>
<td>0.825</td>
</tr>
<tr>
<td>How great a role did the organization’s acceptable use policy for its communications networks play in how you handled the IM discussion?</td>
<td>0.308</td>
<td>0.557</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>1.793</td>
<td>1.957</td>
</tr>
<tr>
<td>Percent of variance explained</td>
<td>29.879</td>
<td>32.611</td>
</tr>
</tbody>
</table>

To examine the relative influence of personal and organizational standards on communications, a ratio of the two summated scales was taken, with organizational standards in the numerator. This measure, which approximates a continuous variable, is different from the typical ways in which self-awareness theory studies have been operationalized. It is most common for subjects to be presented with a single standard, or
to be placed into groups based on scores on a values measure. However, standards have been described as unique, personal, and conflicting, (Silvia et al. 2001) characteristics that are inconsistent with these operationalizations. In this case, rather than measuring subjects on a single standard that fails to capture unique, personal and conflicting motivations for behavioral change, subjects are asked to self-assess the roles of personal and organizational standards as they define them. The ratio of organizational to personal standards is a measure that captures relative influence of the standards. A ratio of more than one indicates that organization standards were reported to be governing communications behavior to a greater extent than personal standards. Descriptive statistics are provided in table 11.

| Table 11. Organization:Personal Standards Influence Ratio Descriptive Statistics |
|---------------------------------|-----------------|
| N                               | 80              |
| Mean                            | 1.12            |
| S.D.                            | 0.78            |
| Minimum                         | 0.17            |
| Maximum                         | 5.00            |

Levene’s test confirms reasonably equal variance across monitoring groups for this variable (Levene’s test statistic=0.256, p=0.615). While a Kolmogorov-Smirnov test rejects a normality hypothesis, the variable produced in this way has a mound-shaped distribution approximating normality. As might be expected, organizational standards are, on average, attributed to have greater influence, which is reflected in the mean of 1.12 and right tail on the distribution.
Control variable

The self-focus scale employed (Matheson et al. 1988) has acceptable internal consistency reliability as assessed by a Cronbach’s alpha of 0.736. Descriptive statistics are provided in table 12. Subjects did use both extremes of the scale, with a minimum summated score of 4 produced when all items were scored as “extremely uncharacteristic of me” and a maximum score of 28 produced when all items were scored as “extremely characteristic of me.” That the endpoints are more than a full standard deviation from the mean score of 21 suggests range restriction did not impair the scale’s operation. The scale’s author proposed that two subscales exist, but as discussed previously, the researcher believes theory supports the existence of just one. Exploratory factor analysis finds only one principle component with an eigenvalue greater than one, with a sharp drop in the scree plot after that point, supporting the interpretation that the four items represent a unitary scale.

Table 12. Self-Focus Scale Descriptive Statistics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>80</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>20.88</td>
</tr>
<tr>
<td><strong>S.D.</strong></td>
<td>5.00</td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
<td>4.00</td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
<td>28.00</td>
</tr>
</tbody>
</table>

A Kolmolvorov-Smirnoff test is unable to reject the hypothesis that the distribution of this scale is normal (p=0.131). As this variable will be used in a model with the monitoring variable, we also check for equality of variances. Levene’s test indicates marginal rejection of the hypothesis that variances are equal (p=0.084). Since this statistic will be applied as a covariate in a MANCOVA model with the monitoring
factor, we check for outliers, to which this test is sensitive. A boxplot identified one potential outlier. The observation was determined to contain some suspicious values, as if the subject were choosing values for convenience rather than after consideration. The subject number was noted for consideration at time of hypothesis evaluation.

*Evaluation of the hypotheses*

H1 posits that organizational monitoring increases the regulatory influence of perceived organizational communications standards on computer mediated communications content relative to personal standards. The initial ANOVA predicting this governing standards ratio from monitoring condition was non-significant. As noted in chapter 3, subjects in the pilot test had difficulty accurately reporting their motivations for communication changes. Self-focused attention generally has a strong, positive effect on the validity of self-reports such as this one (Gibbons 1983). Further, self-focus is the mechanism through which monitoring is theorized to cause downstream responses, including the change in the relative influence of organizational standards. For this reason, a new model including a four item state self-focus summated scale (Matheson et al. 1988) to control for this extraneous source of variation, and an interaction term with monitoring was also tested given the theoretical relationship between the constructs. This model was significant at p=0.013, with significant effects for the monitoring manipulation and its interaction with the self-focus measure (table 13).
Table 13. Factors in Relative Importance Ascribed to Personal and Organizational Communications Standards

<table>
<thead>
<tr>
<th></th>
<th>Type III Sum Sq</th>
<th>Mean Sq</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>6.2785</td>
<td>2.0928</td>
<td>3.8565</td>
<td>0.0126</td>
</tr>
<tr>
<td>Intercept</td>
<td>10.9975</td>
<td>10.9975</td>
<td>20.2654</td>
<td>0.0000</td>
</tr>
<tr>
<td><strong>Monitoring</strong></td>
<td>3.7961</td>
<td>3.7961</td>
<td>6.9952</td>
<td>0.0099</td>
</tr>
<tr>
<td><strong>Self-focus</strong></td>
<td>1.1232</td>
<td>1.1232</td>
<td>2.0697</td>
<td>0.1544</td>
</tr>
<tr>
<td><strong>Mon x SF Interaction</strong></td>
<td>4.3251</td>
<td>4.3251</td>
<td>7.9700</td>
<td>0.0061</td>
</tr>
<tr>
<td>Error</td>
<td>41.2433</td>
<td>0.5427</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>147.6374</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>47.5217</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The estimated marginal means of this model, holding self-focus constant at its mean value, are 1.08 for the non-monitored condition, and 1.15 for the monitored condition, indicating higher perceived influence of organizational standards relative to personal standards on communications for the monitored group (figure 7). Consistent with theory, the model supports an interpretation that as self focus increases, the effect of monitoring on the relationship between organizational standards and communications outcomes increases, and reports about this relationship become more accurate.
Figure 7. Relative influence of organizational and personal standards

The model was run again without the suspected outlier identified by the box plot upon initial consideration of the self-focus scale. Results were slightly stronger with a higher p value for Levene’s test, a lower model p value of 0.008 vs. 0.013, more variance explained with an $R^2$ of 14.4 vs. 13.2 with this observation, and an additional two thousandths of one point separating the estimated marginal means. Results remained in the projected directions. H1 thus receives support, but only when self-focus effects are considered.

H2, H3 and H4 all consider changes in communications variables in the presence of monitoring. All are assessed first with MANCOVA using the monitoring condition factor and standard training recency covariate to predict statement dependent variables. The model is presented first, after which the findings by hypothesis are examined.
All four omnibus statistics are significant for monitoring (F=2.921, p=0.002) and standard recency (F=2.230, p=0.014) as shown in table 14.

**Table 14. Impact of Monitoring and Standard Presentation Recency on Hazard Communications Statement Content**

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intercept</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>0.934</td>
<td>59.406</td>
<td>0.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>0.066</td>
<td>59.406</td>
<td>0.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>14.144</td>
<td>59.406</td>
<td>0.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>14.144</td>
<td>59.406</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Monitoring</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>0.410</td>
<td>2.921</td>
<td>0.002</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>0.590</td>
<td>2.921</td>
<td>0.002</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>0.695</td>
<td>2.921</td>
<td>0.002</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>0.695</td>
<td>2.921</td>
<td>0.002</td>
</tr>
<tr>
<td><strong>Standard</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recency</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>0.347</td>
<td>2.230</td>
<td>0.014</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>0.653</td>
<td>2.230</td>
<td>0.014</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>0.531</td>
<td>2.230</td>
<td>0.014</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>0.531</td>
<td>2.230</td>
<td>0.014</td>
</tr>
</tbody>
</table>

Significant or marginally significant differences were found on the basis of monitoring condition for specific negative self-disclosures, general observed statements, general hearsay, beliefs expressed, hard denials of personal impropriety, and hard denials of hearing about others’ experience (table 15).
Table 15. Significance of Monitoring on Statement Dependent Variables

<table>
<thead>
<tr>
<th>Type III</th>
<th>Sum Sq</th>
<th>Mean Sq</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific negative self-disclosure statements</td>
<td>39.961</td>
<td>39.961</td>
<td>8.607</td>
<td>0.004</td>
</tr>
<tr>
<td>General negative self-disclosure statements</td>
<td>1.108</td>
<td>1.108</td>
<td>1.625</td>
<td>0.206</td>
</tr>
<tr>
<td>Specific, observed statements</td>
<td>0.127</td>
<td>0.127</td>
<td>0.020</td>
<td>0.889</td>
</tr>
<tr>
<td>General observed statements</td>
<td>328.466</td>
<td>328.466</td>
<td>5.527</td>
<td>0.021</td>
</tr>
<tr>
<td>Specific hearsay statements</td>
<td>2.061</td>
<td>2.061</td>
<td>0.073</td>
<td>0.788</td>
</tr>
<tr>
<td>General hearsay statements</td>
<td>277.998</td>
<td>277.998</td>
<td>4.410</td>
<td>0.039</td>
</tr>
<tr>
<td>Beliefs expressed statements</td>
<td>1417.225</td>
<td>1417.225</td>
<td>9.684</td>
<td>0.003</td>
</tr>
<tr>
<td>Hard denial statements in general</td>
<td>0.283</td>
<td>0.283</td>
<td>0.097</td>
<td>0.756</td>
</tr>
<tr>
<td>Soft denial statements in general</td>
<td>7.467</td>
<td>7.467</td>
<td>2.051</td>
<td>0.156</td>
</tr>
<tr>
<td>Hard denial statements of personal impropriety</td>
<td>7.985</td>
<td>7.985</td>
<td>3.340</td>
<td>0.072</td>
</tr>
<tr>
<td>Soft denial statements of personal impropriety</td>
<td>1.321</td>
<td>1.321</td>
<td>0.564</td>
<td>0.455</td>
</tr>
<tr>
<td>Hard denial statements of seeing others' exp</td>
<td>1.937</td>
<td>1.937</td>
<td>0.665</td>
<td>0.417</td>
</tr>
<tr>
<td>Soft denial statements of seeing others' exp</td>
<td>0.013</td>
<td>0.013</td>
<td>1.014</td>
<td>0.317</td>
</tr>
<tr>
<td>Hard denial statements hearing others' exp</td>
<td>5.626</td>
<td>5.626</td>
<td>4.200</td>
<td>0.044</td>
</tr>
<tr>
<td>Soft denial statements of hearing others' exp</td>
<td>0.014</td>
<td>0.014</td>
<td>0.371</td>
<td>0.544</td>
</tr>
</tbody>
</table>

Next the analysis was repeated for incident level variables. This time, standard presentation recency was not significant and so was dropped from the model, which is significant for monitoring (table 15) (F=1.857, p=0.045).

Table 16. Impact of Monitoring on Hazard Communications Incident Content

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>Pillai's Trace</td>
<td>0.950</td>
<td>81.917</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>0.050</td>
<td>81.917</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>19.199</td>
<td>81.917</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>19.199</td>
<td>81.917</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Pillai's Trace</td>
<td>0.303</td>
<td>1.857</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>0.697</td>
<td>1.857</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>0.435</td>
<td>1.857</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>0.435</td>
<td>1.857</td>
</tr>
</tbody>
</table>
The incidents model finds significant or marginally significant differences on the basis of monitoring for specific and general negative self-disclosures, general observed incidents, beliefs expressed, soft general denials, hard personal impropriety denials, soft denials of seeing others’ experience, and hard denials of hearing about others’ experience (table 17).

**Table 17. Significance of Monitoring on Incident Dependent Variables**

<table>
<thead>
<tr>
<th>Type III</th>
<th>Sum Sq</th>
<th>Mean Sq</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific negative self-disclosure incidents</td>
<td>3.272</td>
<td>3.272</td>
<td>5.305</td>
<td>0.024</td>
</tr>
<tr>
<td>General negative self-disclosure incidents</td>
<td>1.295</td>
<td>1.295</td>
<td>4.192</td>
<td>0.044</td>
</tr>
<tr>
<td>Specific, observed incidents</td>
<td>1.295</td>
<td>1.295</td>
<td>2.291</td>
<td>0.134</td>
</tr>
<tr>
<td>General observed incidents</td>
<td>51.232</td>
<td>51.232</td>
<td>5.575</td>
<td>0.021</td>
</tr>
<tr>
<td>Specific hearsay incidents</td>
<td>0.259</td>
<td>0.259</td>
<td>0.406</td>
<td>0.526</td>
</tr>
<tr>
<td>General hearsay incidents</td>
<td>18.733</td>
<td>18.733</td>
<td>1.814</td>
<td>0.182</td>
</tr>
<tr>
<td>Beliefs expressed incidents</td>
<td>219.425</td>
<td>219.425</td>
<td>5.954</td>
<td>0.017</td>
</tr>
<tr>
<td>Hard denial incidents in general</td>
<td>3.754</td>
<td>3.754</td>
<td>1.938</td>
<td>0.168</td>
</tr>
<tr>
<td>Soft denial incidents in general</td>
<td>10.053</td>
<td>10.053</td>
<td>3.891</td>
<td>0.052</td>
</tr>
<tr>
<td>Hard denial incidents of personal impropriety</td>
<td>2.712</td>
<td>2.712</td>
<td>2.989</td>
<td>0.088</td>
</tr>
<tr>
<td>Soft denial incidents of personal impropriety</td>
<td>0.028</td>
<td>0.028</td>
<td>0.129</td>
<td>0.720</td>
</tr>
<tr>
<td>Hard denial incidents of seeing others' experience</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.992</td>
</tr>
<tr>
<td>Soft denial incidents of seeing others' experience</td>
<td>2.313</td>
<td>2.313</td>
<td>3.574</td>
<td>0.062</td>
</tr>
<tr>
<td>Hard denial incidents of hearing about others' exp</td>
<td>5.244</td>
<td>5.244</td>
<td>7.272</td>
<td>0.009</td>
</tr>
<tr>
<td>Soft denial incidents of hearing about others' exp</td>
<td>0.014</td>
<td>0.014</td>
<td>0.392</td>
<td>0.533</td>
</tr>
</tbody>
</table>

H2, which posits that organizational members make fewer higher intensity hazard communications under organizational CMC monitoring than on unmonitored channels, is supported by a significant finding for specific negative self-disclosures statements (F=8.607, p=0.004) and incidents (F=5.035, p=0.024), as well as general negative self-disclosure incidents (F=4.192, 0=0.044), which are the highest intensity hazard communications. Non-monitored subjects made on average 1.76 specific negative self-
disclosures statements, while non-monitored subjects made an average of just 0.36. Non-monitored subjects delivered these in an average of 0.61 incidents for non-monitored subjects, and 0.21 for those in the monitored condition. Non-monitored subjects also engaged in more general negative self-disclosure incidents, at a rate of one in every two interviews on average (mean = 0.54) vs. a rate of about one in four interviews for monitored subjects (mean = 0.28).

Since there was no significant finding on specific negative self-disclosure incidents, another model was run grouping all statements and incidents by hazard intensity category and all denials. This model was significant with a fewer negative self-disclosures made by monitored subjects (F=11.507, p=0.001, with 0.487 incidents in the monitored condition and 1.146 in the non-monitored condition).

H3, which posits that the decrease in the frequency of high intensity hazard communications between monitored and non-monitored conditions is greater than the change in frequency for low intensity hazard communications, is also supported. Significant differences on the basis of monitoring are found in low intensity general hearsay statements (F=4.410, p=0.039), which were 57 percent lower in the monitored condition than in the non-monitored condition. Moderate and high intensity communications saw greater reductions. Moderate intensity general reported observation statements (F=5.527, p=0.021), fell 63 percent. Monitored communications contained 80 percent fewer high intensity specific negative self-disclosure statements than non-monitored communications statements. The magnitude of the differences positively correlates with the degree of hazard intensity.
Since there were no significant changes in one high intensity statements category, additional tests were run to assess changes in all high intensity statements and all low intensity statements by treatment condition. Each of the two ANOVAs were significant. High intensity statements were 73 percent lower in the monitored condition (2.414 vs. 0.641 statements, F=13.740, p=0.000), while low intensity statements were 49 percent lower (7.951 vs. 4.026 statements, F=3.605, p=0.061), providing additional support for this hypothesis.

We observed no statistically significant drops in low intensity hazard communication incidents and cannot conclude these are different from zero. We do find lower monitored incidence of general moderate observed incidents (F=5.575, p=0.021, a change of 57 percent), general high (F=4.192, p=0.044, 47 percent) and specific high (F=5.305, p=0.024, a change of 66 percent) hazard communication incidents, which compared with a flat rate of low intensity incidents provides further support for this hypothesis.

H4 posits that organizational members engage in more denials of knowledge of hazards under organizational CMC monitoring than on unmonitored channels. This hypothesis is also supported with significant differences in five of the coded denials categories, all in the predicted direction.

Non-monitored subjects offered an average of 0.7 hard denials of personal impropriety as compared with 1.1 for monitored subjects (F=3.340, p=0.072). Likewise, non-monitored subjects 0.7 hard denials of hearing about others’ cheating experiences as compared with 1.2 for monitored subjects (F=4.200, p=0.044).
This hypothesis is also supported for incidents with significant or marginally significant findings on soft general denials (F=3.891, p=0.052, with means of 1.8 for non-monitored and 2.5 for monitored communications), hard personal impropriety denials (F=2.989, p=0.088, with means of 0.7 for non-monitored, and 1.1 for monitored), soft denials of seeing incidents (F=3.574, p=0.062, with means of 0.6 for non-monitored communications, and 1.0 for monitored communications), and hard denials of hearing incidents (F=7.272, p=0.009, with means of 0.5 for non-monitored, and 1.0 for monitored communications).

Since there were no findings on some denials statements categories, the analysis was run again on consolidated, less granular data, considering all denials in a single group. Denial incidents experienced a significant change under monitoring with 7.256 incidents per subject vs. 4.878 in the non-monitored condition (F=7.630, p=0.007). However, the change in statements was not significant (F=1.535, p=0.219). While monitored subjects denied more distinct hazards, they made fewer statements about each of them on average than non-monitored subjects (figure 8).
Figure 8. Average denial statements per incident

Table 17 summarizes these findings with descriptive statistics for the significant variables reported at the lowest level of data granularity.
Table 18. Descriptive Statistics for Content Dependent Variables with Significant Monitoring Differences, Grouped by Hazard Intensity, Neutral Beliefs and Denials

<table>
<thead>
<tr>
<th>Category</th>
<th>Monitoring Status</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific negative self-disclosure statements</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>1.756</td>
<td>2.835</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>0.359</td>
<td>0.986</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>1.075</td>
<td>2.243</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td><strong>Specific negative self-disclosure incidents</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>0.610</td>
<td>0.919</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>0.205</td>
<td>0.615</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>0.413</td>
<td>0.807</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>General negative self-disclosure incidents</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>0.537</td>
<td>0.636</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>0.282</td>
<td>0.456</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>0.413</td>
<td>0.567</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>General observation of others statements</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>6.463</td>
<td>10.048</td>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>2.359</td>
<td>3.766</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>4.463</td>
<td>7.887</td>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td><strong>General observation of others incidents</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>2.780</td>
<td>3.991</td>
<td>0</td>
<td>20</td>
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<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>1.179</td>
<td>1.449</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>2.000</td>
<td>3.118</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td><strong>Belief statements</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>38.220</td>
<td>13.947</td>
<td>17</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>29.615</td>
<td>9.613</td>
<td>10</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>34.025</td>
<td>12.715</td>
<td>10</td>
<td>97</td>
</tr>
<tr>
<td><strong>Belief topics (incidents)</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>20.390</td>
<td>6.815</td>
<td>14</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>17.077</td>
<td>5.173</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>18.775</td>
<td>6.258</td>
<td>8</td>
<td>54</td>
</tr>
<tr>
<td><strong>Soft general denial incidents</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>1.829</td>
<td>1.283</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>2.538</td>
<td>1.890</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>2.175</td>
<td>1.636</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td><strong>Hard denials of personal impropriety incidents</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>0.683</td>
<td>0.756</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>1.051</td>
<td>1.123</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>0.863</td>
<td>0.964</td>
<td>0</td>
<td>5</td>
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<tr>
<td><strong>Soft denials of seeing others incidents</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>0.634</td>
<td>0.662</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>0.974</td>
<td>0.932</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>0.800</td>
<td>0.818</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>Hard denials of hearing others statements</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>0.732</td>
<td>0.775</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>1.231</td>
<td>1.459</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>80</td>
<td>0.975</td>
<td>1.180</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td><strong>Hard denials of hearing others incidents</strong></td>
<td>Non-monitored</td>
<td>41</td>
<td>0.488</td>
<td>0.597</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
<td>39</td>
<td>1.000</td>
<td>1.051</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Non-monitored</td>
<td>80</td>
<td>0.738</td>
<td>0.882</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>
H5 posits that organizational members engage in a lower volume of neutral communications under organizational CMC monitoring. Non-monitored subjects offered an average of 38 belief statements (which contained no hazard communications or denial content), while monitored subjects offered an average of 30, a significant difference (F=10.221, p=0.002), providing support for this hypothesis. Non-monitored subjects used these to describe 3.4 fewer belief topics (F=5.954, p=0.017).

H6 posits that organizational members engage in a lower total volume of communications under organizational CMC monitoring. A MANOVA model predicting interview time in minutes, word count and text entry count from the monitoring condition factor was significant (F=4.781, p=0.004), as were tests on time in minutes (F=9.978, p=0.002), text entry count (F=8.889, p=0.004), and word count (F=9.760, p=0.003). In each case, non-monitored communications volume was greater. Means for these variables by monitoring condition are presented in table 19.

<table>
<thead>
<tr>
<th>Table 19. Impact of Monitoring on Communications Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td><strong>Minutes</strong></td>
</tr>
<tr>
<td>Non-monitored</td>
</tr>
<tr>
<td>Monitored</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td><strong>Words</strong></td>
</tr>
<tr>
<td>Non-monitored</td>
</tr>
<tr>
<td>Monitored</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td><strong>Text entries</strong></td>
</tr>
<tr>
<td>Non-monitored</td>
</tr>
<tr>
<td>Monitored</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
**Post hoc analyses**

Several additional analyses were undertaken. We examined total changes in hazard communications statements and incidents by monitoring condition, further examined the organizational standard recency finding, and considered effects of familiarity with the communications technology employed.

**Total hazard communications incidence**

We hypothesized changes in hazard communications by hazard intensity. We now examine overall changes in hazard communications incidents and statements. Separate ANOVA models predicting total hazard communications incidents and statements from monitoring condition were significant (F=6.827, p=0.011 for incidents; F=9.450, p=0.003 for statements). More incidents and statements were offered by the non-monitored group. Means for the two groups appear in table 20.

**Table 20. Total Hazard Statements and Incidents by Monitoring Condition**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-monitored</td>
<td>41</td>
<td>17.756</td>
<td>18.463</td>
<td>0</td>
<td>102</td>
</tr>
<tr>
<td>Monitored</td>
<td>39</td>
<td>7.897</td>
<td>7.947</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>12.950</td>
<td>15.085</td>
<td>0</td>
<td>102</td>
</tr>
<tr>
<td><strong>Incidents</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-monitored</td>
<td>41</td>
<td>7.805</td>
<td>6.889</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>Monitored</td>
<td>39</td>
<td>4.436</td>
<td>4.272</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>6.163</td>
<td>5.973</td>
<td>0</td>
<td>40</td>
</tr>
</tbody>
</table>

**Total observed incidents incidence**

We did not find a significant effect for specific statements of observed incriminating behavior. An examination of the data suggests that subjects made similar numbers of specific statements in the two conditions, with non-monitored subjects more likely to then elaborate in general terms. To further understand this phenomenon, we test
the combined counts of specific and general statements of observed incriminating behavior. Since the organization standard recency effect was found not to apply to these communications, monitoring treatment condition is used as the sole independent variable. The model is significant \(F=5.305, p=0.024\) with a mean in the non-monitored condition of 7.390 and a mean in the monitored condition of 3.231, indicating a rate more than twice as high for non-monitored subjects.

**Organizational standard recency**

The only significant finding for organizational standard recency was for general negative self-disclosures (table 21, \(F=41.988, p=0.000\)), but it is a powerful predictor, giving a model \(R^2\) of 0.336.

**Table 21. Impact of Organizational Standard Presentation and Training Recency**

<table>
<thead>
<tr>
<th>Type</th>
<th>Type III Sum</th>
<th>Mean Sq</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific negative self-disclosure statements</td>
<td>1.026</td>
<td>1.026</td>
<td>0.221</td>
<td>0.640</td>
</tr>
<tr>
<td>General negative self-disclosure statements</td>
<td>28.624</td>
<td>28.624</td>
<td>41.988</td>
<td>0.000</td>
</tr>
<tr>
<td>Specific, observed statements</td>
<td>0.932</td>
<td>0.932</td>
<td>0.143</td>
<td>0.706</td>
</tr>
<tr>
<td>General observed statements</td>
<td>0.789</td>
<td>0.789</td>
<td>0.013</td>
<td>0.909</td>
</tr>
<tr>
<td>Specific hearsay statements</td>
<td>0.517</td>
<td>0.517</td>
<td>0.018</td>
<td>0.893</td>
</tr>
<tr>
<td>General hearsay statements</td>
<td>26.283</td>
<td>26.283</td>
<td>0.417</td>
<td>0.520</td>
</tr>
<tr>
<td>Beliefs expressed statements</td>
<td>23.571</td>
<td>23.571</td>
<td>0.161</td>
<td>0.689</td>
</tr>
<tr>
<td>Hard denial statements in general</td>
<td>3.453</td>
<td>3.453</td>
<td>1.190</td>
<td>0.279</td>
</tr>
<tr>
<td>Soft denial statements in general</td>
<td>0.229</td>
<td>0.229</td>
<td>0.063</td>
<td>0.803</td>
</tr>
<tr>
<td>Hard denial statements of personal impropriety</td>
<td>0.767</td>
<td>0.767</td>
<td>0.321</td>
<td>0.573</td>
</tr>
<tr>
<td>Soft denial statements of personal impropriety</td>
<td>0.413</td>
<td>0.413</td>
<td>0.176</td>
<td>0.676</td>
</tr>
<tr>
<td>Hard denial statements of seeing others' exp</td>
<td>1.747</td>
<td>1.747</td>
<td>0.600</td>
<td>0.441</td>
</tr>
<tr>
<td>Soft denial statements of seeing others' exp</td>
<td>0.000</td>
<td>0.000</td>
<td>0.002</td>
<td>0.965</td>
</tr>
<tr>
<td>Hard denial statements hearing others' exp</td>
<td>1.812</td>
<td>1.812</td>
<td>1.352</td>
<td>0.248</td>
</tr>
<tr>
<td>Soft denial statements hearing others' exp</td>
<td>0.000</td>
<td>0.000</td>
<td>0.006</td>
<td>0.939</td>
</tr>
</tbody>
</table>

To further understand the relationship, correlations between the recency measure and general negative self-disclosures were considered separately in monitoring and non-
monitored conditions for subjects also in the organizational standard condition. Under monitoring, the relationship is non-significant (p=0.219). However, when not monitored, more recent presentation of the standard is associated with a higher level of general negative self-disclosures (r=0.714, p=0.000). Examples of these communications are now examined (figure 9).

- probably not listed where I got all of my information from on a works cited page.
- i may not have re arranged a sentence enough for Safe Assignment to accept... or enough that it was much different from the original.
- maybe paraphrased something I saw on the internet, like on wikipedia, and used it in a paper without citing
- I have had people tell me what questions to expect during an exam based on them taking the class in the past. I have listened without sticking my fingers in my ears. However, I think every time the questions have changed.

**Figure 9. Sample general negative self-disclosure statements from non-monitored subjects receiving the organizational standard treatment**

While not inherent in the construct definition or typical of general negative self-disclosures overall, those found in the non-monitored, organizational standard treatment condition tended to be stated tentatively (“probably,” “may not have,” “maybe”), even though subjects have first hand knowledge of their own behavior. Subjects have also minimized incrimination by reporting on incidents which were scored as among the least serious, on average, in the cheating seriousness survey used to prime the discussion task (ranked 13-16 out of 19), or in the case of the final example, by indicating that the information received was not solicited and probably not useful.

To further understand this phenomenon, the correlation matrix of dependent variables measured from subjects in both the non-monitored and organizational standard conditions was consulted. While none are significant, one approaches significance, the
correlation with specific negative self-disclosures ($r=-0.349$, $p=0.113$). This negative correlation suggests that general negative self-disclosures may have been substituted for more incriminating specific negative self-disclosures by those who had recently been presented with the organizational standard. These subjects appear to have chosen examples they judged to be minimally incriminating, and stated wrongdoing in tentative, qualified terms to better comply with the standard than conveying specific negative self-disclosures would have done.

The findings discussed in this section were reassessed without one extreme but apparently legitimate observation for a subject who completed the organizational standard training the day prior to the experiment. With this single subject removed, the recency affect is no longer statistically significant.

Although the data point appears to be legitimate, with so little data available to model the effect, the findings for hypotheses 2, 3 and 4, which were assessed with this construct in the model, were reassessed without it. There were no changes in incident p-values out to two significant digits. For statements, one marginal finding for hard denials tipped past the threshold traditionally applied for marginal significance (from $p=0.072$ to $p=0.106$), but other statistical decisions were unchanged.

**Effects of familiarity with the technology**

Since subjects not familiar with the communications technology employed might have responses that are different from those for whom novelty would have no impact, years of IM experience was added to monitoring and organizational standard recency as a predictor of communications statement impacts, and as a covariate for monitoring alone (since recency was found not to be significant) in a model predicting incident impacts.
Experience with the technology was non-significant (F=1.110, p=0.367 for statements; F=0.709, p=0.766 for incidents.).
Chapter 5

Discussion

This dissertation offers an array of significant findings, theory development, a research framework, a coding scheme, implications for organizations in the areas of both monitoring and organizational standards, and a research agenda for others interested in these topics. Each of these contributions is addressed in this chapter.

Key findings

Workplace monitoring of computer mediated communications changes both how much and what people communicate. Not only is discussion that may inculpate the speaker or writer, organizational colleagues, or the organization itself less prevalent, so are neutral statements. In the controlled laboratory experiment, non-monitored subjects engaged in discussions that were 26 percent longer than those of their monitored counterparts. They made 21 percent more text entries and used 21 percent more words. Unencumbered by the effects of monitoring, they issued 29 percent more neutral belief statements about 19 percent more topics (coded as incidents). On every neutral and overall volume measure collected, monitored subjects chose a lower level of communications. This is activity that makes up a large portion of a typical workday, with e-mail alone accounting for 28 percent of worker computer use (Taylor 2007). While recent figures are difficult to obtain, several years ago over 60 percent of employees were already spending more than 90 minutes per day on e-mail and instant messaging alone,
with many spending more than four hours ("E-Mail and IM Survey" 2004), it is clear
that the measured communications represent a substantial portion of what goes on in a
typical organization.

Potentially incriminating hazard communications distinguished monitored and
non-monitored subjects to an even greater extent, with those free of monitoring
volunteering more than five times as many specific, personally incriminating statements
about more than three times as many incidents, with differences of 90-174 percent in five
other categories of incriminating statements and incidents. On every category in which
significant differences were found, monitored subjects engaged in lower levels of
communication.

Unlike with neutral measures, we did not find statistically significant differences
in every category into which hazard communications were coded. In particular, numbers
of hearsay incidents, both general and specific, and numbers of specific hearsay
statements were not statistically distinguishable between treatment conditions. This is
consistent with theory: the smaller or absent motivational effects of perceived self-
organizational standard misalignment for lower intensity hazard communications topics
are less likely to lead to communications suppression.

The other type of coded hazard communication not found to show statistically
significant differences between monitored and non-monitored groups was specific,
observed incriminating behavior. However, when moderate intensity communications
were grouped, monitored subjects were seen to offer far fewer at this middle level of
hazard intensity. While the findings by hazard intensity category were as predicted, this
finding within a category suggests people may not, or may not always, make the finer
hazard intensity distinction between general and specific communications. This is a question for study in other domains to further explore the effect.

We also observed increases in denials of involvement in and knowledge of hazard communications topics under monitoring. However, even though the number of topics (incidents) denied increased, the number of denial statements made fell. Under monitoring, subjects were quick to issue denials, but not to discuss them. Although we did not separately hypothesize statement outcomes, this observation is consistent with using denials to guide discussion away from a hazardous topic to comply with a perceived organizational standard.

While modest absolute changes experienced in some categories were small, the percentage changes are dramatic. The experiment manipulated monitoring in a CMC exchange that lasted an average of 36 minutes. In organizations, workers are projected to spend 41 percent of their time on e-mail by 2009 ("Addressing Information Overload in Corporate Email: The Economics of User Attention" 2007), and businesses are expected to adopt instant messaging almost universally by 2010 (Kerner 2007). For employees who blog at work, and for those who use social networking sites, the time commitment is typically much greater (Boyd et al. 2007; Mattson et al. 2007). In this environment, it is tempting to conclude that monitoring is a helpful tool for reducing information overload or the distraction of unimportant communications. Unfortunately, the experiment reported herein demonstrates that the changes are not limited to unimportant communications, but affect those focused on important organizational topics.

Although a detailed qualitative analysis is beyond the scope of this project, the researcher notes that she could typically correctly assign anonymized transcripts devoid
of treatment condition information to the correct treatment condition after first exposure to a short portion of the record. The monitored transcripts generally have a different tone that does not invite discussion. For the study, the interviewers were instructed to follow a pre-determined interview script. In a corporate environment, the nature of the monitored comments makes it likely that many conversation partners would drop unwelcome paths of inquiry, or that under monitoring’s influence, they would avoid making inquiries over monitored communications channels in the first place. Thus monitoring effects measured herein are likely to be understated from those naturally occurring in organizational environments. Studies in more natural settings, while less controlled, may provide insight here.

**Contributions to research**

This work advances research with both conceptual and methodological contributions. Conceptual contributions include development in the area of standards operation in self awareness theory, an examination of figure ground contrasts to apply this theory to a new research domain, CMC monitoring, and a research framework for studying self awareness in this domain. Methodological contributions consist of the hazard communications taxonomy and coding scheme, and a relative standards influence instrument and methodology for use in studying competing standards.

**Theory development**

While it is well founded in a hundred-plus year history of research on the self, self awareness theory is a relative newcomer to information systems research. In this study, self awareness theory is synthesized with CMC and surveillance literature and applied to a new domain, monitoring computer mediated communications. CMC monitoring has
some of the aspects of well tested manipulations of self-focus, and the theory’s self-focus predictions prove effective for understanding changes to communications in organizations under monitoring.

Understanding the operation of self awareness theory in the face of multiple standards has been described as a longstanding open research area (Silvia et al. 2001). Typically research subjects have been provided with a standard, or alternatively have had their personal standards measured for assignment to treatment groups based on pre-existing standards (Silvia et al. 2001). This dissertation undertakes an area in which organizational standards are typically inferred, and in which personal standards vary and are seldom made explicit. It has been supposed that theory selection is an either-or choice, based on what standard is most salient, but typical tests of the theory do not allow assessment of this supposition (Silvia et al. 2001). Herein, the self awareness induced by monitoring is theorized to increase the regulatory influence of organizational standards on organizational communications at the expense of personal communications standards rather than having one standard supplant another. In fact, the experiment provided evidence that multiple standards are in operation, but that their relative influence is impacted by monitoring, the means of self-focus induction employed.

**Research framework**

The communications impacts of monitoring model developed and successfully tested is both novel and parsimonious: the presence or absence of monitoring, and the recency of training on an organizational standard, along with self-focus as a control variable, predict dramatic changes in computer mediated communications content towards the organizational standard or to minimize monitored behavior.
The monitoring model’s value is extended by the fact that it predicts lots of different changes in communications behavior: to three categories of hazard communications, denials, neutral statements, and communications volume. Monitoring is measured to account for 14.4 percent of the variation in the perceived relative influence of organizational standards on communications, 10.2-11.3 percent of the change in communications volume, and 7.1 and 11.6 percent of the change in neutral incidents and statements respectively. Recency of presentation explained 33.6 percent of the change in general negative self-disclosure statements. Monitoring also explained 10.8 percent of the observed difference in hazard statements, and 8.0 percent of the difference in hazard incidents. Finally, monitoring accounted for 8.9 percent of the difference in denial incidents.

**Hazard communications taxonomy and coding scheme**

To study a domain in which multiple communications impacts were anticipated based on a perceived organizational standard, this work defines hazard communications and related denials constructs and places them within two taxonomies. The hazards taxonomy has three levels of hazard intensity initially developed from negative self-disclosure, whistleblowing and gossip literature streams, with construct definitions adjusted from these domains to produce non-overlapping constructs (Holton et al. 2008). Within each, general and specific categories were distinguished (figure 2). Further, hazard effects across domains were explored (figure 3). Denials, related to hazards by their exculpatory nature, were also organized into a taxonomy congruent with the hazard communications taxonomy. These were also subdivided into general and specific categories based on observations during the pilot study.
Next, a coding scheme was developed that defines these three levels of hazard intensity, including both general and specific types of each; four categories of denials, with both general and specific categories of each; and a beliefs category. Each of these is further refined into incidents and statements groupings. Given the novelty of this research stream, the granularity of coding offers two benefits. First, a very detailed level of analysis is possible, building our understanding of the components of the new constructs. Second, it allows, new groupings to be computed and tested as new research questions are posed, and as our understanding of the domain progresses. For instance, future work might explore the possibility that general and specific hazard communications are more appropriately examined separately rather than paired within the three hazard intensity categories as proposed in this dissertation. The detailed coding schema allows post hoc exploration and testing of new hypotheses.

**Relative standards influence measure and methodology**

One of the goals of this research was to progress our understanding of the influence of competing behavioral standards to make a contribution to self awareness theory. Based on behaviors observed during the 40 interview pilot study and a review of relevant literature, a nine item measure of standards governing instant messaging behavior was developed. In a pilot assessment, the measure performed rather well, with high internal consistency reliability and without evidence of other problems. However, when used with the subjects in the main study, internal consistency reliability was poor, and remained weak after dropping several items. Further, different items performed poorly in the personal and organizational versions of this scale. Results across subjects varied dramatically. The measures were discarded.
The differences in performance across subjects provides a likely explanation of the problem. While there has been no agreement on this matter, it has been previously suggested that standards are highly personal (Silvia et al. 2001). In this case, it would be very difficult to represent the relevant domain across subjects, and particular sets of behaviors would not be expected to covary in predictable ways across subjects.

Strong performance of the discarded scale in the pilot test, where subjects were not engaging in the measured behavior at the time of standards assessment, is similar to the relatively common practice of using standards pre-tests to assign subjects to treatment condition in self awareness studies. The observation of dramatically different pilot test and study performance of the tested instrument suggests this pre-test methodology may give misleading results.

Fortunately, the potential problem with standards measurement was anticipated. An alternative measure and methodology allow standards influence assessment even without clear and consistent definition of the behaviors belonging to the standard domain for individual subjects. The new items, which measured perceived influence of organizational standards on communications behavior, and perceived influence of personal standards on communications behavior, performed better. The methodology employed both allows for and demonstrates that standard selection is not a matter of choosing one standard to the exclusion of all others. A ratio of the organizational and personal standards scales provided a measure of relative standards influence that did not require all subjects to define standards in the same terms but respected their implicit standards definitions which may include personal and unique elements. Further, the ratio
measure allows for the assessment of competing standards which were shown to operate in this case.

*Areas for future work*

Computer-mediated communications monitoring is a new research domain. The laboratory experiment tested a realistic instant messaging system with recent monitoring notification that took place immediately prior to the communications session in which dependent variables were measured. It also provided an unobtrusive but constant visual reminder of monitoring. Enterprise IM systems may address on screen reminders with periodic broadcast messages, obtrusive randomly timed inline reminders, reminder notices which must be actively dismissed at log-in, or as in this experiment, with a constant visual reminder. Within e-mail systems, periodic e-mail reminders and statements in e-mail footers have been frequently observed. Despite these myriad communications systems features for monitoring notices and reminders, not all organizations that monitor regularly provide frequent monitoring reminders. We are aware of no catalog of use of various CMC systems features for monitoring and reminders to allow us to assess which applications of which features are most common. Exploration of the human-computer interface issues could allow stronger systems performance tailored to an organization’s needs. Future work should test different parameters on both of notification and reminder features, alone and in combination.

The experiment included a single communications session. Future work should study effects over longer time horizons so attenuation of the effects can be assessed. Separate assessment of monitoring impacts over time with frequent reminders, and over time with infrequent or absent reminders is a rich area for future studies.
Hazard communications will be difficult to study in field settings as companies are in no hurry to divulge incriminating information. This study used a non-corporate organizational setting, studying students in their role as members of a university organization. We note that this was not a role simulation. Student subjects were not asked to respond as if they were members of some other organization or in roles that were foreign to them. The task was realistic and appropriate to subjects’ role in the organization studied. However, this is still but one role in one organization. Several disciplines were represented: information systems, history, marketing, nursing, psychology, and mass communications. While the sample size is insufficient to study responses separately by discipline, taken together they tell a cohesive story.

Interestingly, we found results regardless of whether instant messaging was a new technology for the subjects. Monitoring effects are predicted not to be learned norms but driven by psychological processes that are expected to transcend the particular CMC medium chosen. That experience with instant messaging had no impact on results supports this interpretation. Nevertheless, monitoring other existing and emerging CMC media merits separate consideration.

The study predicts reduced communications volume overall and of neutral statements in particular based on the motivation of people to escape the self-focusing stimulus provided by monitoring, with predictions supported by empirical results. The strength of the finding on these outcome variables suggests that channel switching behaviors to non-monitored channels may also be substantial in organizational settings. The necessity to limit the scope of this study dictates that an investigation of these impacts be slated for future work. A number of research questions are possible: When
other channels are cultivated for delivery of hazard communications, such as the teaching hospital mortality and morbidity reports, Army after action reports, and exit interviews described previously are employed, can communications volume be maintained or expanded? When such communications are not cultivated, do face to face communications increase? How does total anonymity (as opposed to just visual anonymity tested herein) affect the impact of monitoring on communications outcomes?

The study focused on the effects of organizational CMC monitoring, along with understanding drivers of the changes. Post hoc analysis also determined that organization standard presentation recency may be associated with a reduction in non-specific personally incriminating communications. However, no impacts on overall volume were found, and no beliefs, denials or hazard categories other than general negative self-disclosures, were identified. Future work should study the impact of organizational standard presentation and training, including a more comprehensive test of the recency effect, evaluation of training and reminder methods. Considering these effects both with and without monitoring is desirable.

This first application of self-awareness theory to CMC monitoring also suggests a number of areas for future work with the theory whether in this domain or others. The figure-ground contrast means of self-focus induction are not often studied and should be explored with different applications of the theory. The relative standards influence methodology and measure proved valuable in this initial test and hold promise for future investigations of the impacts of self-awareness whether induced by CMC monitoring or other mechanisms. Other means of examining realistic, personal, unique and potentially
competing standards, for instance using the repertory grid technique (Kelly 1955), could further elucidate the operation of standards.

**Contributions to practice**

The two independent variable constructs define the two major areas for application of this work to organizations: monitoring features and practices, and organizational standard practices.

**Implications for CMC monitoring in organizations**

With the environmental shift towards vastly increased organizational CMC monitoring, understanding behavioral consequences is critical for organizations. In the sensitive hazard communications context examined herein, awareness of communications content impacts should inform monitoring feature design and use to continue to satisfy legislative, security, or other motivations while enabling new benefits such as increased disclosure of hazards on which an organization would choose to act, increased communication of non-hazardous, relevant information, and limiting drawbacks like reduction of incidence of other desirable communications.

Although the changes both predicted and measured are substantial, the researcher is not aware of organizations having made attempts to compensate for them to the extent that they are considered negative, nor to encourage them to the extent that they are assessed to be desirable. To what extent various changes are positive or negative and what specific responses are appropriate is a matter for consideration by organizations employing monitoring. A review of sample considerations follows.

Cutting down the overall level of communications, to the extent that those cut are excessive rather than valuable, could probably benefit most organizations barreling
towards the prediction of 41 percent of work time spent on email and a greater total on all electronic communications. While we in no way mean to demean the value of communications, we note that they are not appropriate for every task, and inappropriate communications are estimated to cost companies $198 billion annually ("Anti-Spam Trends" 2003). There are also individual differences in communications preferences with effectiveness implications (Spitzberg 2006). Unfortunately, the communications lost include valuable information.

Reporting of misdeeds is likely to be desirable for organizations seeking to curtail them. Since monitoring of CMC reduces the incidence of reporting on potentially incriminating behaviors, organizations wishing to promote reports may want to provide whistleblowing hotlines that provide anonymity, are outsourced so reports are not made directly to an organizational authority, and they may even wish to reward reports which are corroborated in investigations.

Increasing denials of incriminating behaviors may be desirable for an organization subject to external auditing of communications, especially since there is some evidence that individuals align their behavior with stated standards and opinions (Gibbons 1990). Such a company may wish to provide frequent inline reminders that communications are monitored and subject to audit.

In many circumstances, sharing of input and ideas leads to stronger decisions (Jonathan et al. 1998). To facilitate such sharing when monitoring might curtail it, organizations may wish to provide for face to face communications free from the perception of monitoring, or alternatively, provide anonymous communications channels like certain GDSS systems (Jessup et al. 1990).
Obviously, whistleblowing hotlines, inline reminders, face to face communications alternatives, and anonymous communications systems do not constitute a comprehensive list of possibilities. The features of CMC systems and alternatives to them provide myriad options that go well beyond the few discussed here.

We further note that organizational goals are not unidimensional. Companies have multiple and competing motives when it comes to the content of their electronic communications. Multiple responses are appropriate for addressing multiple, disparate organizational goals. Systems provide means of satisfying many of these, but to date, the effects of monitoring have been unknown and so have not been given appropriate heed in decision-making about the design, use, and communication about communications systems monitoring features.

**Implications for organizational standard training and presentation**

The experiment provides some evidence that a recently presented organizational standard can impact communications for organizational members who believe their communications not to be monitored. In practice, we know that almost all medium and large organizations have some form of an electronic communications policy in place, but also that virtually all employ some forms of electronic monitoring. While estimates vary, it appears that a substantial minority of organizations still do not monitor e-mail, and more still leave instant messaging unmonitored ("2001 Electronic Policies and Practices Survey" 2001; "2003 E-Mail Rules, Policies and Practices Survey" 2003; "Electronic Monitoring Survey" 2005; "Electronic Monitoring and Surveillance Survey" 2007). Organizations choosing not to monitor a particular communications medium may see
some regulatory benefit to providing an organizational policy for the medium. For that policy to be effective, however, it may need to be frequently presented.

In this study, behavioral intention to comply with the policy after first presentation was high. On a pilot test of the organizational standard training manipulation, just 24 percent said they would not adjust their communications behavior under this policy, each of them stating that they believed they were already in compliance (n=17). During the experiment, the policy was presented on average 9 days before communication impacts were measured, and the variation in lag allowed us to observe that the recency effect fit an inverse square rate of decline. There was admittedly limited data available to fit this curve as the study aimed for homogeneity on this point.

While frequent, obtrusive policy reminders are possible, such as inline instant message comments and use of broadcast IM features to provide policy notices, the organizational standard effects observed in the non-monitored condition were limited to one the category of general personally incriminating statements. There are far more direct ways to promote this type of communication such as the mortality and morbidity conferences used by teaching hospitals and after action reports including poor decision making and outcomes which have been previously discussed. Organizations have many other options, including leading by example to demonstrate appropriate behavior and responding appropriately, which may often exclude punitive outcomes for honest mistakes. Full consideration of the options is beyond the scope of this work.

The observed policy presentation and training effect held only when monitoring was not in place. Regulations like HIPAA and Sarbanes-Oxley require evidence of policy enforcement that goes beyond infrequent presentation of and training on a policy.
Monitoring is one of those enforcement mechanisms, and it was shown in this study to have much farther reaching impacts than policy presentation and training.

Since organizations avoiding monitoring may do so based on privacy concerns or cost, we note here that CMC compliance options that require minimal involvement from human readers are available. Monitored instant messaging systems have been around nearly a decade, and email monitoring features for more than two ("IM Shop?" 2004; Zuboff 1988). In this time our ability to find very targeted types of content using automated means has grown quite sophisticated (Holton In Press; Overly Undated), allowing targeted compliance actions to be undertaken often without direct human intervention. Communications systems that automatically scan content and notify users when content is blocked or that require authorization before sending messages suspected of being in violation of policy may provide the most potent standard reminders, and they entail using human reviewers only when necessary. They also go a great distance towards demonstrating effective policies are in place for ensuring regulatory compliance in this regard.

Concluding thoughts

This dissertation explores an area believed to be of considerable organizational impact: the enactment of monitoring through computer mediated communications systems. A quarter century of work on the language/action perspective (Goldkuhl et al. 1982) has provided support for the notion that communication is a form of organizational action, an idea explored extensively in the realm of computer-supported cooperative work. Communication is not just a way to exchange information. It determines what gets done in organizations, and in particular determines the processes that underlie information systems.
This research begins to investigate the complex interaction of CMC systems and organizational monitoring, specifically examining how monitoring computer mediated communications impacts its content. The primary contribution of this work is simply theoretical and empirical support for the dramatic influence of monitoring on what is communicated over CMC channels.

This work extends prior research by bringing together our current understanding of CMC with surveillance and performance monitoring research and self awareness theory. It introduces the influence of organizational CMC monitoring on self-focus to explain changes in communications. In addition, this research seeks to develop our understanding of standard selection when there are competing candidate standards. Standard selection has been described as an open self awareness theory issue. We have both theorized that when monitoring organizational communications standards take on increased influence over communications relative to personal standards, and measured that self-focused subjects are able to perceive this change in their own motivations.

Through its exploration of hazard communications and further development of the hazard communications taxonomy (Holton et al. 2008), the dissertation contributes to our knowledge of contextual influences on CMC content. Due to the nature of the research context selected, it also provides and tests a research framework for classifying hazard communications for analysis, which may be applied in other contexts.
References


"Addressing Information Overload in Corporate Email: The Economics of User Attention," The Radicati Group, Palo Alto, CA, 2007.


Baltes, B.B., Dickson, M.W., Sherman, M.P., Bauer, C.C., and LaGanke, J.S.

"Computer-Mediated Communication and Group Decision Making: A Meta-


"Computer, email and Internet use policy," City of Merriam, pp. 1-5.


Duval, S. "Conformity on a visual task as a function of personal novelty on attitudinal dimensions and being reminded of the object status of self," *Journal of Experimental Social Psychology* (12:1) 1976, pp 87-98.


"Electronic communication policy for all Volt entities, affiliates, subsidiaries and divisions," Volt Information Services, Inc., pp. 1-4.


Garvin, D.A. "The U.S. Army's After Action Reviews: Seizing the Chance to Learn," in: 
Learning In Action, A Guide to Putting the Learning Organization to Work, 

George, J.F. "Computer-based monitoring: Common perceptions and empirical results," 

Personality (51:3) 1983, p 517.

in Experimental Social Psychology (23) 1990, pp 249-302.

Gilsdorf, J.W. "Written corporate policy on communicating: A Delphi survey," 

Third International Conference on Information Systems, Ann Arbor, Michigan, 


"Health coverage portability : Health Insurance Portability and Accountability Act of 
1996 (HIPAA) ", 1996.

Hiltz, S.R., Turoff, M., and Johnson, K. "Experiments in group decision making, 3: 
disinhibition, deindividuation, and group process in pen name and real name 


"HIPAA secure e-mail," Orchestria, 2008.

Holton, C. "Text Mining E-mail to Identify Disgruntled Employee Fraud Risk," *Decision Support Systems* (In Press).


Mattson, E., and Barnes, N.G. "The Hype is Real: Social Media Invades the Inc. 500," University of Massachusetts Dartmouth’s Center for Marketing Research, Dartmouth, MA.


"To Be or Not to Be an IM Shop?," *Wall Street Technology*:February 12, ) 2004.


Appendix 1: Coding scheme

Hazard communications

Hazard communications are statements that may incriminate the speaker or the organization to which he or she belongs, in this case, the university. The potentially incriminating topic discussed in the transcripts is cheating activity.

For each type of cheating discussed, hazard communications constructs distinguish between whether it was something the subject participated in, saw happen, or heard about happening. Within each of these categories, statements are coded as specific or general. A specific incident is one that, if we had full details, could be tied back to a place, time and person or people. General incidents are sweeping statements with no hooks to isolate a particular incident.

Specific incidents may be indicated by the following

• Number of incidents is clear, e.g. (one time, a couple of times)
• Tied to a particular subject (in history)
• Written in past tense (people programmed formulas into their calculators, students would write out their notes)
• Particular people are mentioned (my friend, my roommate, a guy, I, people in my class, all of my friends)

Statements that do not fit the specific categories (e.g. students bring cheat sheets to class) are coded as general.

Confessional (“done”): Negative self-disclosures
Characterized by a first person description of cheating, or other indicators that the subject engaged in cheating behaviors described.

**Specific example**: “In my organizations and systems class two years ago, my friend and I didn't understand the work and some guys thought we were cute ladies and helped us with every assignment.”

This is also a W incident since the subject indicates others were involved.

**General example**: “For people like myself who are computer illiterate, if I happen to have a question on how to perform a particular task, you can bet that I am not going to sit around waiting for a response, when I could call a friend and they could tell me the same thing.”

**Witnessed (“seen”): Reports of observed incriminating behaviors**

Characterized by language indicating that the subject observed the cheating behavior in question.

**Specific example**: “like in the computer class where the guys helped us...there were three of them that helped us.”

(This is also S since the subject indicates own involvement.)

**General example**: i used to be in a frat they had old test and the convience of cheating was there and available and i saw that some probably 7-15% would

**Heresay (“heard about”): Relayed reports of received information that incriminates others**

Characterized by language indicating that the subject heard talk or otherwise received a report about the cheating behavior in question.
Specific example: my roommates were talking about it earlier this semester. They are all taking internet classes and have used the discussion boards to cheat.

General example: I've heard of friends paying others to write them for them if they just don't write very well or don't have the time - or basically just don't want to.

Should a subject explain that a group or its members engage in a cheating behavior and that he or she is a member of the group (e.g., a fraternity), the incident should be coded as first-hand knowledge, witnessed or confessional as appropriate, not heresay.

The “cheating penalty” guideline

Sometimes subjects may describe something they did that might not be cheating, as if they want to be responsive but have nothing to say or aren’t willing to say anything truly incriminating. Samples like these may be somewhat ambiguous: “I asked my mom to read my paper to see if it made sense,” “After I wrote it out my essay, I got my friend to type it up because I type so slowly LOL,” or “I’ve been asked for answers, but I didn’t give them.” If the behaviors described do not appear to be ones subjects feel could have subjected the “perpetrators” to cheating penalties, they should not be assigned hazard codes.

Denials

Denials are characterized by exculpatory language. They are coded into categories congruent with hazard communications.

Denials of personal impropriety include language denying participating in cheating activity.
Examples: “I have never been involved with any situation that cheating has been an issue on campus,” “I don't know because I don't cheat.”

Denials of witnessing others’ cheating include language denying firsthand knowledge of others’ cheating activity.

Example: “I've never seen someone cheat on a test”

Denials of relayed knowledge of others’ cheating include language denying secondhand knowledge of others’ cheating activity.

Example: “People don’t really talk about cheating”

General denials do not fall into the above categories.

Example: “I don't think cheating goes on here.”

The denial examples shown here are all hard denials. A **hard denial** disclaims knowledge of a hazardous topic, e.g., “I don’t cheat,” or when asked about how cheating occurs, “I don’t know.” In some cases, a denial of knowledge may be suggested rather than stated. A **soft denial** implies a lack of firsthand or secondhand knowledge without stating it outright, and often accompanies speculation. A soft denial may include statements like these: “I would guess that,” “Maybe they,” “This is just a guess,” most typically followed by a description of behaviors that would be coded as hazard communications if they were said to have happened rather than being framed as speculative. One category of close calls is worth nothing: statements of the type, “I don’t know besides what I already told you.” This is not a denial, as long as some other comment refers to did address the question asked. If a subject is deflecting with a comment like this – no other comment did address the question – it is a hard denial.

**Beliefs**
Beliefs are meaningful, non-procedural statements that do not fall into the above categories. They may appear in the same statement as denials to justify the denial and can appear independently. A single belief is one contained thought about cheating behavior.

Examples: “It can be solo [B1] and it can include another by the consent of another to allow it to happen [B2],” “anyone who is under a great deal of stress of getting a good grade would cheat, i thing.”

Grouping Related Statements

In addition to coding each statement with a hazard code, statements about the same incident of cheating get a common incident number. They are applied consecutively. The first confessional statement gets the incident number one, for instance. If a second statement talks about the same instance of cheating committed by the subject, that also receives an incident number of one. A statement describing a different way or time the subject cheated would receive a different incident number.

Quantifying incidents

Incidents are coded conservatively. For specific incidents, if the statement only indicates that something happened and quantity is not clear, one incident per category is recorded (e.g. per course if multiple courses are mentioned). If something is said to have happened more than once / was ongoing / was typical and quantity is not clear, two incidents are coded. For general statements, each statement is counted separately. There is no common incident number as there is no specific incident.
Incident numbers may be revised based on new information provided during an interview. For instance, a subject may say initially, “I’ve seen cheating in math and science,” which indicates at least two incidents. Later it may become clear that both Calculus and Statistics were included in the math description (3 incidents total so far), and that cheating by programming formulas into calculators happened in both calculus and statistics while looking on someone’s paper was seen only in statistics (the original two categories are now broken into at least 4 incidents). The specific counting is subject to the guidance listed above (which could result in a count of more than four incidents). Incidents are coded at the greatest level discovered (at least two incidents in statistics, one in calculus, and at least one in “science”) propagating these back to the original statement. “I’ve seen cheating in math and science” would therefore get at least four incident codes in this example to this statement to the subsequent statements to which it pertains.

Denial statements on the same topic are also grouped by incident number.
Appendix 2: Standards Applied Measure

1. How much did complying with organizational rules for electronic communications affect what you said in the instant message interview?

2. How important was it to stick to your own views on what it’s OK to talk about when being interviewed over IM?

3. How great a role did the organization’s acceptable use policy for its communications networks play in how you handled the IM discussion?

4. How much did your own thoughts about how to use IM to discuss various topics affect what you said during the interview?

5. To what extent did this organizational standard impact the IM discussion you just had?

6. To what extent did your own personal standards for IM communications impact the IM discussion you just had?

Each item was rated on a scale of 1 to 7 where 1 is “Not at all,” and 7 is “A great extent.”
Appendix 3: Self-Focus Scale Items, as Adapted
from Matheson et al. 1988

1. During this IM discussion, I've generally been very aware of myself, my own perspectives, and attitudes.
2. Rather than being distracted by my task and what is going on around me, I have been thinking about myself in this IM discussion.
3. In this IM discussion, I have wondered about the way I've responded and presented myself in comparison to others who are answering these questions.
4. In this IM discussion, I have been thoughtful about what people who later read the transcript of this chat may think of my responses.

Each item was rated on a scale of 1 to 7 where 1 is “extremely uncharacteristic of me,” and 7 is “extremely characteristic of me.”
Appendix 4: Organizational Standard Manipulation Check

From what you remember, does the USF’s electronic communication standard permit IM messages like these?

1. A student saying how she got into a concert for free but against USF’s rules
2. Entering a USF help desk call into the system as a desktop issue when the software was installed on a laptop
3. Telling somebody where to find t-shirts with a messed up USF logos on eBay when the shirts were supposed to have been destroyed.

Each item is answered yes or no.
About the Author

Carolyn F. Holton conducts research on computer mediated communications systems, including the impacts of system monitoring and user culture, the development of group norms, the spread of rumors and organizational responses to them, their use for detecting and deterring fraud, and pedagogical applications. She also examines information systems leadership issues. Her computer mediated communications monitoring work is soon to appear in both IEEE Transactions on Professional Communication and Decision Support Systems. She earned an MBA from Duke University, where she was designated a Fuqua Scholar, and a BBA from The George Washington University, summa cum laude. She was also selected to attend the 2007 ICIS doctoral consortium and has been nominated for the 2008 University of South Florida College of Business Doctoral Research Award.