Identifying Employees Who Fit with Electronic Communication Styles

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Identifying Employees Who Fit with Electronic Communication Styles

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of
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ABSTRACT

Electronic communication is no longer solely used by globally dispersed work teams. It is an integral part of today’s organizations whether they include remote workers or not. Therefore, it is important to understand how employees perceive electronic communication from their supervisor and the impact that perception has on the worker. Researchers have been adamant in the assertion that relationship-oriented communicated is better conducted face-to-face. The current study seeks to add to the existing body of research by (1) examining how the proportion of relationship-oriented communication that is electronic affects both subordinate perceptions of communication openness and subordinate job satisfaction, and (2) identifying individual characteristics that may moderate this effect. The individual characteristics examined include subordinate preference for electronic communication, tolerance for ambiguity, extraversion, and technology self-efficacy.
CHAPTER ONE:

INTRODUCTION

Electronic communication is often an integral part of modern workplaces. In 2015, 37% of U.S. workers reported telecommuting, up from only 9% in 1995 (US Gallup Work and Education Pool; U.S. Census Bureau 2016). Virtual work has likely risen due to the many advantages it facilitates from both the company’s and worker’s perspectives. For example, the increasing quality of workplace communication technology (e.g. Outlook, Skype for Business, Webex, TelePresence) allows organizations to leverage globally dispersed expertise. Additionally, communication technology provides employees with more flexibility in the timing and location in which they communicate (Kossek & Michel, 2010). Organizations benefit from this because communication can continue when employees travel to other offices or client-sites. Also, workers may prefer organizations that allow them to replace long commutes with remote work.

As the utilization of electronic communication in the workplace has increased, so has research in this area. The research on electronic communication and its impact on individuals, teams, and the organization, has predominately occurred with virtual teams and telecommuters. Allen, Golden, and Shockley (2015) summarize the definitions of these types of workers in their review of the area. Virtual teams are defined as a specialized type of physically distributed work team that uses technology-mediated communication to accomplish goals. Telecommuters are individuals that regularly perform their work at a location other than the office. Telecommuters can be entirely remote, meaning they never come into the workplace, or they can be partially
remote, that is they take advantage of the option to work from another location when it suits them.

Research around virtual teams and telecommuters has found both drawbacks and advantages of working virtually. Differences in virtual team and face-to-face team job performance, trust, cohesiveness, and leadership behaviors have been examined (e.g. Henderson, 2008; Jarvenpaa & Leidner, 1999; Straus & McGrath, 1994). However, researchers have lamented that most of this research occurs using workers at the extreme ends of the virtuality spectrum, meaning workers that communicate only electronically due to physical dispersion or only face-to-face (Bell and Kozlowski, 2002; Golden & Veiga, 2008; Griffith, Sayer, & Neale, 2003; Kirkman & Mathieu, 2005; Moser & Axtell, 2013). Physical distance and degree of electronic communication are distinct constructs that differentially predict virtual worker outcomes (Schweitzer & Duxbury, 2010). Therefore, it is difficult to distinguish which of these outcomes are due to the use of electronic communication itself and which are due to other factors, such as being in separate time zones, or having large cultural differences between members (Hinds and Mortensen, 2005; O’Learly & Cummings, 2007). For example, co-workers located in different time zones will have fewer overlapping work hours, thus less time to communicate (Cummings, 2004).

Electronic communication is a tool used not only by globally dispersed work groups, but rather is an integral part of the workplace, even for traditional, non-remote workers (Moser & Axtell, 2013). It is rare to find workers who operate completely face-to-face, incorporating no email or telephone communication. Co-workers within the same building can easily meet face-to-face but still incorporate electronic communication, especially if they are located on different floors (Axtell, Fleck, & Turner, 2004). Thus, to extend our understanding of electronic
communication in the workplace, we should incorporate research that investigates its impact on traditional, non-remote workers, as well as those working remotely.

One consequence of particular interest, related to electronic communication, is job satisfaction. Job satisfaction has been defined as a favorable or unfavorable feeling towards one’s job (Weiss, 2002). When employee job satisfaction is high, it results in a number of positive outcomes for the organization, such as lower turnover and higher employee productivity (Hom, Lee, Shaw, Kausknecht, 2017; Slutsky, Chin, Raye, & Creswell, 2019). Therefore, employing managerial strategies that enhance job satisfaction is of great interest to organizations. Supervisors often have discretion in how they communicate with their subordinates and should choose methods that optimize employee outcomes, such as job satisfaction. Supervisors serve as gateways to company resources, opportunities, and information. Thus, high quality supervisor-subordinate relationships are a critical component of both job satisfaction and job performance in virtual workers (Golden & Veiga, 2008).

Of importance, is understanding if supervisors should adapt their level of electronic communication to fit individual subordinates. Researchers have extensively examined the consequences of being in a highly virtual environment, yet we have not established the characteristics of employees who best fit in this type of environment. Jacobs (1996) recommended that an employee’s personality be considered when allowing them to telecommute. This sentiment was echoed by Haines, St-Onge, and Archambault (2002) when they stated that the characteristics of individual employees play an important role in telecommuting outcomes.

Work groups that rely on technology to communicate can be less effective at performing critical interpersonal processes such as managing conflict and developing trust (Jarvenpaa &
Leidner, 1999; Straus & McGrath, 1994). Employees in these environments may report feeling socially isolated and fear they are missing out on promotional opportunities (Cooper & Kurland, 2002; Rodgers & Teichlz, 2001). This suggests that electronic forms of communication may not be well suited for relationship-oriented communication. Highly electronic environments clearly have unique qualities that may not be compatible with every worker. As more organizations incorporate work groups that use electronic communication, it is vital to identify the employees who will thrive at all levels of these environments. Due to the prevalence of electronic communication in today’s workplaces, it is important to identify how employees may interpret supervisor’s use of electronic communication and what the ramifications are for the employee.

The Current Study

The current study seeks to examine how a supervisor’s use of technology to communicate relationship-oriented information impacts subordinate perceptions of communication openness and job satisfaction. Relationship-oriented communication is the communication that takes place to build commitment, manage conflict, and develop employees. Researchers agree that electronic forms of communication that include fewer social cues are not as good a fit for communicating relationship-oriented information as is face-to-face communication (Griffith & Neale, 2001; Malhotra & Majchrzak, 2005; Maznevski & Chudoba, 2000). Therefore, I predict that when a greater proportion of a supervisor’s relationship-oriented communication is done through electronic means of communication, it will result in their subordinates reporting lower perceptions of communication openness and job satisfaction.

In this study I also investigate how individual differences in employees moderate the electronic communication-communication openness and electronic communication-job satisfaction relationships. To investigate this issue, I examine four individual characteristics that
are theoretically related to job attitudes in virtual environments: tolerance for ambiguity, extraversion, technology self-efficacy, and preference for electronic communication.

The current work aims to extend the literature in several ways. First, it will examine the effects of electronic communication in a population other than globally distributed workers. This will help to identify the effects of electronic communication in populations that are in traditional work environments and not necessarily physically separated. Second, it will follow the recommendations made by researchers (e.g. Bell and Kozlowski, 2002; Golden & Veiga, 2008; Griffith, Sayer, & Neale, 2003; Kirkman & Mathieu, 2005; Moser & Axtell, 2013) to examine virtuality as a continuous variable rather than comparing only the effects of face-to-face communication with electronic communication. Today’s workplaces incorporate all levels of electronic communication, thus including employees at all levels of virtuality provides the research with greater external validity.

Finally, as the use of electronic communication in the workplace increases, it is important to identify how employees fit within these environments. This study will provide organizations with information relevant to staffing that may require electronic supervisor-subordinate communication. Additionally, it may assist supervisors who have discretion over how they communicate with subordinates to identify the most effective communication media for relationship-oriented information.

**Theoretical Overview and Hypothesis Development**

**Electronic Communication**

Communication is a necessary organizational process that allows individuals, groups, and teams to exchange information and accomplish goals. Effective communication plays an important role in enhancing organizational and individual outcomes (Pandey & Garnett, 2006).
Organizational communication research at the individual level has largely focused on affective responses of the employee (Keyton, 2017). For example, communication from management can improve job satisfaction during periods of change, such as organizational restructuring, downsizing, and acquisitions (Nielson & van Selm, 2008; Kramer et al., 2004). Emanoil, Todericiu, and Fraticui (2013) argued that organizations underestimate the importance of communication. They found that more than 80% of the employees surveyed considered internal communication a factor in whether or not they intended to leave their job.

The technologies that enable organizational communication have rapidly evolved over the last 30 years. Present-day workers may use phones, virtually stored documents edited in real time, instant messaging services, and internal message boards, as well as other technology tools. Some companies have even begun using telepresence robots, which allow workers to virtually stroll around the office (Markoff, 2010). These technologies have been collectively referred to by such names as computer-mediated communication (CMT), technology-mediated communication, information technology (IT) and information communication technology (ICT; Gibson et al., 2014). Early virtual workplace research most frequently uses the term computer-mediated communication; however, it is evident that computers are merely the tip of the iceberg in the possible ways team members can exchange information in modern workplaces. Thus, this paper will use the more encompassing term electronic communication.

The impact of electronic communication use in the workplace has primarily been examined within research on virtual teams and telecommuters. These individuals are physically dispersed from each other or their home office, and thus must rely on technology to communicate. Work teams that rely solely on electronic communication may have delays in communication, have less open communication, have less spontaneous communication, and have
more misunderstood communication (Andres, 2012; Marlow, Larczenza & Salas, 2017; Mesmer-Mangus & DeChurch, 2010; Saunders, Slyke, & Vogel, 2004). Although virtual workers may face challenges, there are also advantages. More virtual communication reduces hierarchical differences between team members facilitating communication across members of different organizational levels (Anderson, McEwan, Bal, & Carletta, 2007). It also improves brainstorming and increases the sharing of unique information (Anderson, McEwan, Bal, & Carletta, 2007; Mesmer-Magnus & DeChurch, 2009; Dennis & Valacich, 1993).

**The Role of Supervisors.** Because research on electronic communication at the individual level is primarily found within teleworker research, it is difficult to interpret how the existing research applies to supervisor-subordinate communication. Telework is often a perk provided to high performing employees. Indeed, the demographics of individuals who take advantage of flexwork options are generally highly educated, high income, professional employees (Golden, 2001; “Telecommuting Trend Data”, 2018). These individuals often choose telework options as a way to help balance work and family (Bailey & Kurkland, 2002). Conversely, subordinates may be the recipient of electronic communication from their supervisor and have little control over how their supervisor chooses to communicate with them. Supervisors choosing to telework themselves may be focused on maximizing their own job satisfaction and employing what is easiest for them without regard to the needs of their employees. Therefore, the current study seeks to examine the consequences of supervisors’ extent of electronic communication on subordinate perceptions of communication openness and job satisfaction.

Supervisors are appointed by the organization to oversee subordinate tasks and performance; thus, the supervisor-subordinate relationship is by nature hierarchical. The effective communication between supervisors and subordinates has received a great deal of
attention (Steele & Plenty, 2015). Supervisor-subordinate communication can flow both upward and downward (Goris, Vaught, & Pettit, 2000). Supervisors may use communication to explain tasks to the employee, update them on organizational goals and procedures, and provide them with performance feedback (Katz & Kahn, 1966). Subordinates may use communication to inform their supervisors about such topics as, progress on their tasks, needed resources to complete tasks, and conflicts with their co-workers (Katz & Kahn, 1966).

For a framework of the behaviors supervisors may engage in with their employees we turn to leadership theory. Within leadership theory, leader behaviors are typically sorted into two major categories: task-oriented behaviors and relationship-oriented behaviors (Liao, 2017). Task-oriented behaviors are those directed at managing the work itself and progressing the group on performance goals. Examples include goal setting, initiating structure, clarifying goals, planning, and job training. Relationship-oriented behaviors are those directed at building morale and empowering employees. Examples include building commitment, managing conflict, and coaching. Examples of behavioral leadership theories that exemplify this dichotomy are The Ohio State leadership study’s (Stodgill, 1950) two factors of consideration and initiating structure and Bass’s (1990) transformational and transactional leadership styles (Derue, Nahrgang, Wellman, Humphrey, 2011).

The impact of electronic communication on task behaviors specifically has been found to be moderated by the interdependence of the task (Rico & Cohen, 2005). Straus and McGrrath (1994) found that when tasks required more coordination between groups, group members were more satisfied when communication was face-to-face than electronic. On the other hand, the impact of electronic communication for relationship-oriented conversations specifically has not been explored. Theorists have universally argued that relational behaviors, such as negotiation
and conflict management, are all best conducted over rich communication environments (Griffith & Neale, 2001; Malhotra & Majchrzak, 2005; Maznevski & Chudoba, 2000). Because the recommendations for relational tasks are both prevalent and consistent, yet have not been tested, the current study will focus on testing the assumptions of relationship-oriented communication. Specifically, I will examine if there are consequences to employees when the communication from their supervisor about relationship-oriented tasks is proportionally more electronic.

**Media Richness Theory.** Today’s supervisors have many options when choosing a method of communication. Media richness theory serves as a framework to explain when one method may be more desirable than another (Daft & Lengle, 1984; 1987). Media richness theory argues that each communication medium varies in its ability to convey verbal and non-verbal information in a way that can be understood quickly. Individuals should thus select a communication method that reduces uncertainty and equivocality. Equivocality in this theory refers to the possibility of misinterpreting the information being conveyed.

Media richness theory places media on a continuum of rich to lean. It defines richer media as conveying more information cues, allowing for more immediate feedback, replicating natural language more closely, and allowing for more personalization than leaner media. Due to these qualities, richer media is able to reduce uncertainty faster than leaner media. The richest form of media is considered face-to-face communication.

Ganesh and Gupta (2010) used experts to rank-order various communication media on their level of richness. Commonly used organizational media in order from richest to leanest are face-to-face meetings, video conferences, telephone communication, instant messages, E-mails, and electronic bulletin boards. Telephone communication, and electronic email are further down
the richness scale and media such as announcements, posters, or electronic bulletin boards are the leanest.

Research suggests that richer media are more beneficial to complex tasks like negotiation and conflict management, and for interactions in less established relationships (Cramton, 2001; DeSanctis and Monge, 1999; Griffith and Neale, 2001; Malhotra and Majchrzak, 2005; Maznevski and Chudoba, 2000). Leaner forms of communication are less capable of reducing ambiguity and have a lag in response; thus, high use of lean communication can have a negative effect on employee outcomes (Ramsower, 1985).

Media richness theory argues that the channel of communication should be selected to match the task at hand. This is a logical proposition, however there may be many factors driving a supervisor’s communication media choice. A qualitative study by Shinnawy and Markus (1997) found that employees preferred to call when they needed information from others but preferred to receive emails when others communicated with them regarding the same tasks. People felt calling was more immediate and took less effort than reading an email when they were responsible for integrating the information. However, receiving email from others allowed them to skip over parts of the conversation and save time. Thus, factors such as how much a supervisor personally prioritizes the task or how much effort the communication requires may also drive communication choices. Though media richness theory provides a rationale for why certain media fit with certain tasks, it cannot fully predict that supervisors will choose the perfect medium for the task at hand.

Consequences of Lean Communication

The demands and resources of an individual’s job are often dependent on their supervisors, as supervisors provide subordinates with both tasks and secure resources to
accomplish those tasks. Supervisors may interact with employees daily and serve as a gatekeeper for information from and to individuals higher in the organization (Chen, Tsui, & Farh, 2002). Thus, it is not surprising that the quality of supervisor communication impacts subordinate outcomes such as job satisfaction, motivation, organizational commitment, and perceptions of organizational justice (Mikkelson, York, Arritola, 2015; Shahid & Azhard, 2013; Yang & Kassekert, 2010). Because of the importance of supervisor communication, it is essential that supervisors choose methods of communicating with their employees that maximize communication quality.

**Communication Openness.** Communication is the mechanism through which all other group activities occur; thus, identifying the aspects of communication that predict positive workplace outcomes has been a priority of organizational researchers (de Guinea, Webster, & Staples, 2012; Marks et al., 2000). Certain qualities of communication, such as communication openness, have been identified as particularly impactful to organizational functioning (Rodgers, 1987). Communication openness refers to the perception that exchanging information with the target entity (e.g. organization, team, supervisor, peer, subordinate) is easy and comfortable (Rodgers, 1987). Thus, when an employee perceives that the communication with a target, such as his supervisor, is open, he is indicating he feels information is freely shared by his supervisor and he can reciprocate information sharing (O’Reilly and Roberts, 1977).

Communication openness is considered desirable as it has been linked to several positive workplace outcomes. For example, open communication between team members is predictive of team performance and may be more important than how often team members communicate (Marlow, Lacerenza, Paoletti, Burke, & Salas, 2018; Mesmer-Magnus & DeChurch, 2009). Open communication facilitates an environment where pertinent information is appropriately
distributed and contributes to the overall quality of the information that is exchanged (Marlow, et al., 2018).

Supervisors often serve as gatekeepers for key organizational information, opportunities, and resources. Thus, it is important that employees perceive there is open communication with their supervisor, specifically that their supervisor is appropriately sharing pertinent knowledge with them and that they can share information with their supervisor. This information sharing allows employees to obtain resources to complete goals and to alert supervisors of problems, such as coworker conflicts, threats to delivery deadlines, or safety concerns.

Electronic communication has become more prevalent in workplaces; therefore, it is important to understand how this may impact communication openness. A meta-analysis by de Guinea, Webster, and Staples (2012) found that physically dispersed employees perceived less knowledge sharing in their team than employees who met face-to-face. It is difficult to know whether this is due to the use of lean, electronic communication or an aspect of the physical dispersion, but leaner forms of communication are less capable of conveying the same amount of information as face-to-face communication. Leaner forms of media are more ambiguous and high use of lean media may decrease the employee’s perception of overall communication openness. Employees may perceive they are missing out on relevant information when supervisors primarily use electronic forms of communication. Additionally, leaner forms of communication generally take less time and effort, thus may signal to employees that communication is less of a priority. Employees may perceive supervisors using higher levels of electronic communication as less approachable and open to sharing information.

**Hypothesis 1:** Supervisor electronic communication will be negatively correlated with employee perceptions of communication openness.
**Job Satisfaction.** Attitudes are an evaluative judgement of favor or disfavor held towards a source (Judge, Weiss, Kammeyer-Mueller, & Hulin, 2017). The two most frequently studied job attitudes are job satisfaction and organizational commitment. Job satisfaction is typically conceptualized either as a cognitive evaluation that is a consequence of other affective states or as a construct that contains both cognitive and affective pieces (Judge et al., 2017). The measurement of job satisfaction can reflect satisfaction with work components such as the supervisor, co-workers, communication, pay, and the work itself.

Job satisfaction has consequences for both the organization and the individual. Organizations take interest in job satisfaction because it is predictive of employee job performance, organizational citizenship behaviors, and turnover (Bowling, 2007; Eatough, Chang, Miloslavic, & Johnson, 2011; Hom, Lee, Shaw, & Hausknecht, 2017). Job satisfaction can also have an impact on outcomes important to individuals such as sleep quality (Litwiller, Snyder, Taylor, & Steele, 2017). Employee job satisfaction is influenced by many components, including supervisory communication.

Braun, Hernandez Bark, Kirchner, Stegmann and Van Dick (2019) compared employees’ preferred proportion of electronic communication to their supervisor’s actual proportion of electronic communication. Employees in the study overall indicated a preference for more face-to-face communication with their supervisor than they currently had. More face-to-face communication was associated with higher job satisfaction and perceptions of the supervisor as a more effective leader. Subordinates also felt that face-to-face communication was of higher quality than telephone or email communication. Braun and colleagues (2019) argue that leadership is a process in which both parties must reach high levels of mutual understanding.
Thus, communication methods that allow for richer information exchange are better suited for supervisor-employee communication.

*Hypothesis 2: Supervisor electronic communication will be negatively correlated with employee job satisfaction.*

**Individual Differences**

**Preference for Electronic Communication.** Theorists have purported that electronic media is universally less suited for conducting relationship-oriented communication (Griffith & Neale, 2001; Malhotra & Majchrzak, 2005; Maznevski & Chudoba, 2000). However, modern workplaces continue to utilize electronic communication for those conversations due to both convenience and necessity, such as when team members are traveling. Since the use of electronic communication shows no sign of decreasing, it behooves organizations to identify workers that can thrive under supervisors that use electronic communication to discuss relationship-oriented information. There may be employee characteristics that reduce the negative impact electronic communication can have.

The notion that there are individual characteristics better suited for highly electronic work environments has previously been put forth by several theorists. For example, Jacobs (1996) argued that organizations should consider an employee’s personality before allowing them to participate in telecommuting programs. This statement was echoed by Haines, St-Onge, and Archambault (2002) when they stated that employee characteristics predicted the success of telecommuting outcomes. A review of the area by Krumm and Hertel (2013) makes it apparent that there is little systematic evidence (e.g. job analysis) available to identify the specific KSAOs required for environments with high amounts of electronic communication. One area of interest is work style preferences, specifically if there are employees who prefer working with colleagues
virtually more than face-to-face. These individuals may be better suited to receiving relationship-oriented communication electronically.

Work style preferences are classified as values and influenced by previous experiences or an individual’s personality (Bell, 2007). Examples of work style preferences include preference for power distance, preference for collectivistic workplaces, and preference for teamwork (Bai, Donng, Liu, & Liu, 2017; Ramesh, & Gelfand, 2010; Fernandez, 2017). Existing evidence suggests that employee work style preferences impact important individual and organizational outcomes. A meta-analysis by Bell (2007) found that teams with higher preference for teamwork also had higher team performance. Fan and Han (2018) explored the fit between employees and their supervisor’s workstyle preferences in a study of communication style. When communication styles were more similar, both employee job satisfaction and performance were higher. These examples demonstrate the impact of the fit between work style preferences and the environment.

Virtual environments come with unique challenges; thus, finding individuals who prefer electronic work styles may help to identify employees best suited for supervisors who incorporate electronic communication. Preference for electronic communication (PEC) is defined as an inclination towards communicating through electronic media as opposed to face-to-face (Telford, Ramsay, Frick, Bedwell, 2017). The concept of PEC suggests that when employees need to brainstorm, collaborate, or complete tasks with coworkers, they may prefer to do so through technology rather than face-to-face. Therefore, individuals high on PEC may be more satisfied with supervisors that use electronic communication to hold relationship-oriented conversation. Individuals high on PEC may also perceive the supervisory relationship as more
open when supervisors predominantly use electronic methods to communicate relationship-oriented information.

_Hypothesis 3: PEC will moderate the relationship between supervisor electronic communication and perceptions of communication openness such that when supervisor electronic communication is high, employees with higher PEC will report higher communication openness than employees with low PEC.

_Hypothesis 4: PEC will moderate the relationship between supervisor electronic communication and job satisfaction such that when supervisor electronic communication is high, employees with higher PEC will report higher job satisfaction than employees with low PEC.

In addition to preferred work styles, several other individual difference factors may be relevant when considering the impact of relationship-oriented electronic communication; specifically, tolerance for ambiguity, extraversion, and technology-self-efficacy. Relationship-oriented communication conducted through electronic channels contains fewer social cues, thus the emotions of the supervisor may be more ambiguous. This ambiguity may be particularly stressful for low tolerance for ambiguity individuals, but a non-issue for individuals high in tolerance for ambiguity. Indeed, in their identification of KSAOs relevant to staffing virtual teams, D’souza and colleagues (2017) argue employees’ tolerance for ambiguity should be considered. Individuals low in extraversion may also be more tolerant of the lack of social interaction in electronic communication. Indeed, Hertel, Schroer, Batinic, and Naumann (2008) found that introverts actually preferred email over face-to-face communication. Finally, because electronic communication requires the use of technology, it is important to consider employees’ comfort level with technology (Shin, 2004). Individuals who are more confident with the
technology their supervisor uses may feel more comfortable communicating with their supervisor through it; thus, technology-self efficacy may be an important individual characteristic in this relationship.

**Tolerance for Ambiguity**

Tolerance for ambiguity is defined as seeing ambiguous situations as desirable rather than a threat (Budner, 1962). Individuals low in tolerance for ambiguity feel psychological discomfort when the situation is uncertain or vague and prefer situations to be black and white (Chu, Lin, Chen, Tsai, & Want, 2015). Conversely, individuals high in tolerance for ambiguity may view ambiguous situations as an interesting challenge (Lauriola, Foschi, Mosca, & Weller, 2016).

According to media richness theory, lean media, such as email, are more ambiguous than rich media, such as face-to-face communication. It takes more time to reach a shared understanding through electronic than face-to-face communication. Therefore, employees who must utilize more electronic communication, may be more successful if they have higher ambiguity tolerance. Lean, electronic communication is by nature more ambiguous than richer, face-to-face communication. Thus, employees low in tolerance for ambiguity will likely be less satisfied with supervisors who use high levels of electronic communication to communicate relationship-oriented tasks.

The impact of tolerance for ambiguity has not been examined in the context of supervisor-subordinate communication. However, in their study on global virtual teams, Duranti and de Alemida (2012) argued that Brazilian teams preferred richer communication than their American counterparts due in part to their preference for uncertainty-avoidance and cultural context in communication. Electronic communication lacks the non-verbal cues present in face-to-face communication and it takes longer to reach the same level of shared understanding than
in face-to-face meetings (Daft & Lengle, 1984). High communication openness occurs when employees feel all the relevant information is being conveyed to them in an accurate, timely manner. When supervisors use high levels of electronic communication, individuals low in tolerance for ambiguity will likely perceive the communication as less open than individuals high in tolerance for ambiguity.

**Hypothesis 5:** Tolerance for ambiguity will moderate the relationship between supervisor electronic communication and perceptions of communication openness such that when supervisor electronic communication is high, employees with lower tolerance for ambiguity will report lower communication openness than employees with high tolerance for ambiguity.

**Hypothesis 6:** Tolerance for ambiguity will moderate the relationship between supervisor electronic communication and job satisfaction such that when supervisor electronic communication is high, employees with low tolerance for ambiguity will report lower job satisfaction than employees with high tolerance for ambiguity.

**Extraversion.** Extraversion is a personality characteristic exemplified by sociability, liveliness, and assertiveness (Costa & McCrae, 1992). Extraversion is beneficial when jobs require high levels of interpersonal interaction (Barrick & Mount, 1991; Mount & Barrick, 1998; Bell, 2007). Extraversion has been linked to communication behavior in several studies. For example, Porter and colleagues (2003) found that more extraverted employees asked for help from others more often. Macht, Nembhard, Kim, and Rothrock (2014) found that the positive relationship between extraversion and team performance was mediated by communication frequency.
Less interpersonal information is exchanged in electronic communication, when compared to face-to-face communication, thus it takes longer to reach the same level of intimacy (Walter, 1996). Haines and colleagues (2002) argued that employees with greater need for social interaction should not telecommute. Due to a preference for social interactions, extraverts will likely be more satisfied with their job when their supervisor incorporates more face-to-face interaction when communicating relationship-oriented information. Additionally, due to the fact that face-to-face communication offers more opportunities for interpersonal feedback and more social cues, extraverted individuals will likely perceive supervisory relationships that incorporate more electronic communication to discuss interpersonal issues as less open.

*Hypothesis 7: Extraversion will moderate the relationship between supervisor electronic communication and perceptions of communication openness such that when supervisor electronic communication is high, employees high in extraversion will report lower communication openness than employees low in extraversion*

*Hypothesis 8: Extraversion will moderate the relationship between supervisor electronic communication and job satisfaction such that when supervisor electronic communication is high, employees high in extraversion will report lower job satisfaction than employees low in extraversion*

**Technology Self-Efficacy.** Self-efficacy is a cognitive evaluation about one’s ability (Bandura, 1977). Individuals display generalized self-efficacy as well as self-efficacy towards specific behaviors or goals. Technology self-efficacy is a self-assessment of the ability to perform new technology tasks (McDonald & Siegall, 1992). Several theoretical articles have suggested technology literacy is relevant to person-environment fit in virtual environments (e.g. Shin, 2004; Kirkman & Mathieu, 2005), such that employees must have the relevant technological
capabilities to communicate electronically. Employees who have low confidence in their ability to use technology will likely be dissatisfied with environments that demand high levels of technology use. Additionally, they may not feel confident in their ability to ask questions via electronic means, thus perceiving supervisor relationships with more electronic communication as less open.

*Hypothesis 9: Technology self-efficacy will moderate the relationship between supervisor electronic communication and perceptions of communication openness such that when supervisor electronic communication is high, employees with high technology self-efficacy will report higher communication openness than employees with low technology self-efficacy.*

*Hypothesis 10: Technology self-efficacy will moderate the relationship between supervisor electronic communication and job satisfaction such that when supervisor electronic communication is high, employees with high technology self-efficacy will report higher job satisfaction than employees with low technology self-efficacy.*
CHAPTER 2:
METHODS

Participant Recruitment

Study participants were recruited from Amazon’s Mechanical Turk (MTurk). To be eligible for the study, participants were required to work at least 20 hours at a non-MTurk job and have a supervisor at their non-MTurk job. To ensure quality of responses, three attention check questions were included. Inattention and random responding are concerns during any survey research. To detect this, three attention questions were embedded (e.g. “Mark strongly agree for this item”). Participants who missed one or more of the attention questions were excluded from analyses.

A final sample size of at least 300 was targeted based on a power analysis in G*Power. Of the initially recruited sample of 366 eligible participants, 46 (13%) failed at least one attention question and were dropped from the study. The final resulting sample for analyses was 320.

The sample was on average 35 years old, consisted of predominately white (77%) and contained slightly more males (57%) than females (42%). As with all studies, the generalizability of the research sample must be considered. Current MTurk demographics are available at http://www.mturk-tracker.com (Ipeirotis, 2010). The age breakdown reported as of August 2018, indicate that the Mturk population I drew participants from is younger than the U.S. working population.

Additionally, most respondents had more education than a high school degree (90%), which indicates the sample is more highly educated than the United States labor force (U.S.
Bureau of Labor Statistics, 2016). Respondents on average worked 40 hours per week, had worked with their supervisor for 2 or more years, and spent 30% of their week in a different location than their supervisor. No participants reported spending 100% of their week away from their supervisor and about a quarter of participants (26.3%) spent 100% of their time in the same location as their supervisor. This suggests that all participants had the opportunity to meet face-to-face with their supervisor. A full depiction of the study demographics is available in Table 1 and 2.

**Measures**

**Tolerance for Ambiguity**

Tolerance for ambiguity was measured using the MSTAT-II (McLain, 2009). Throughout the study of tolerance for ambiguity, researchers have operationalized ambiguity in several different ways. The MSTAT-II assesses tolerance for ambiguity across situations that are complicated, do not contain clear answers, or are novel. The reliability, $\alpha = .91$, indicates acceptable internal consistency. The full scale is available in Appendix A.

**Extraversion**

Extraversion was measured using the Mini-IPIP (Donnellan, Oswald, Baird, & Lucas, 2006). The Mini-IPIP is a frequently used, shortened version of the 50-item IPIP (Goldberg, 1992). These items measure the Big-Five lexical markers. The five extraversion items had acceptable internal reliability, $\alpha = .95$, in the current study. Response options range from 1 = *very inaccurate* to 6 = *very accurate*. The full scale is available in Appendix B.

**Preference for Electronic Communication**

The preference for electronic communication scale (Telford, Ramsay, Frick, Bedwell, 2017) contains 8 items assessing an individual’s preference for communicating with coworkers.
virtually vs face-to-face. The scale had acceptable internal reliability of $\alpha = .97$. Example items include “I prefer to collaborate with others online” and “Email, texting, and online chats are my preferred methods of coworker communication.” Response options range from 1-\textit{strongly disagree} to 6-\textit{strongly agree}. The full scale is available in Appendix C.

**Technology Self-Efficacy**

Technology self-efficacy was measured with McDonald and Siegall’s (1992) measure of experience and confidence in using technology. The scale had acceptable internal reliability of $\alpha = .87$. The five-item scale’s response options range from 1-\textit{strongly disagree} to 6-\textit{strongly agree}. The full scale is available in Appendix D.

**Supervisor Relationship-Oriented Electronic Communication**

The proportion of relationship-oriented communication that is conducted via electronic means was assessed with an item asking participants to allot what percentage of relationship-oriented communicating their immediate supervisor allots to specific media listed in Appendix E. Supervisor electronic communication was the total percentage of communication that is not face-to-face. Participants also reported the frequency of relationship-oriented communication conducted by their supervisor. Response options ranged from 1-\textit{not at all} to 5-\textit{almost every day}. This five-item scale demonstrated acceptable internal reliability, $\alpha = .81$, and is available in Appendix F.

**Communication Openness**

Communication openness was assessed using a modified form of O’Reilly and Roberts’ (1977) five-item measure. The original measure included items referring to a work group (e.g. Communication in this group is very open), so the referent was modified to refer to the supervisor (e.g. Communication with my supervisor is very open). The referent of this scale has
been successfully adapted in other workplace communication research (e.g. Lu, Li, Leung, Savani, & Morris, 2017). Additionally, three items in the original scale use the word talk, such as “It is easy to talk openly to my supervisor”. Because the current study focus includes written communication as well as oral communication, the word *talk* was changed to *communicate* to avoid confusion. Response options ranged from 1-*strongly disagree* to 6-*strongly agree*. Internal reliability of the scale was acceptable, $\alpha = .95$. The final full scale is available in Appendix G.

**Job Satisfaction**

Job satisfaction was measured using the Job Satisfaction Survey (JSS; Spector, 1985), a popular facet measures of job satisfaction. It expands upon the five facets of the Job Descriptive Index (JDI; Smith, Kendal, & Hulin, 1969) to include nine facets. The full scale contains 36 items measuring pay, promotion, supervision, benefits, contingent rewards, operating procedures, co-workers, nature of work, and communication. These facet measures can be aggregated to a general dimension of job satisfaction, as in the current study, or examined at the facet level.

This scale was deemed the most appropriate of the available job satisfaction measures for the current research questions because its conceptualization of job satisfaction includes aspects of the supervisor and of communication. Examples include “My supervisor is quite competent in doing his/her job” and “I often feel that I do not know what is going on with the organization”. Response options ranged from 1-*strongly disagree* to 6-*strongly agree*. Internal reliability was acceptable $\alpha = .96$. The full scale is available in Appendix H.

**Demographics**

Demographic variables included average hours worked per week, the length of time the employee had worked with his or her supervisor, industry of employment, sex, and age. These
variables were used to better understand the respondent sample. The full list of demographic items is available in Appendix I.

**Procedure**

All measures were hosted on the survey platform Qualtrics. The study was posted as a Human Intelligence Task (HIT) on the Amazon MTurk website. The survey took participants about 20 minutes to complete on average. Based on the payment recommendations of previous studies, participants were compensated $1.75 for completing this survey.
Table 1. Sample Demographics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td></td>
</tr>
<tr>
<td>18-29</td>
<td>30.31%</td>
</tr>
<tr>
<td>30-39</td>
<td>38.13%</td>
</tr>
<tr>
<td>40-49</td>
<td>14.38%</td>
</tr>
<tr>
<td>50-59</td>
<td>13.44%</td>
</tr>
<tr>
<td>60-69</td>
<td>3.13%</td>
</tr>
<tr>
<td>Unknown</td>
<td>0.63%</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>56.60%</td>
</tr>
<tr>
<td>Female</td>
<td>41.60%</td>
</tr>
<tr>
<td>Unknown</td>
<td>1.80%</td>
</tr>
<tr>
<td>Ethnicity&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td>0.60%</td>
</tr>
<tr>
<td>Asian</td>
<td>10.00%</td>
</tr>
<tr>
<td>Black/African American</td>
<td>12.50%</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>0.60%</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>7.20%</td>
</tr>
<tr>
<td>Middle Eastern</td>
<td>0.90%</td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>77.00%</td>
</tr>
<tr>
<td>Highest Education Level</td>
<td></td>
</tr>
<tr>
<td>Some high school, no diploma</td>
<td>0.60%</td>
</tr>
<tr>
<td>High school graduate, diploma or the equivalent (e.g. GED)</td>
<td>9.70%</td>
</tr>
<tr>
<td>Some college credit, no degree</td>
<td>18.40%</td>
</tr>
<tr>
<td>Trade/technical/vocational training</td>
<td>3.40%</td>
</tr>
<tr>
<td>Associate degree</td>
<td>10.30%</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>44.40%</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>9.10%</td>
</tr>
<tr>
<td>Professional degree</td>
<td>3.10%</td>
</tr>
<tr>
<td>Doctoral</td>
<td>0.31%</td>
</tr>
<tr>
<td>Unknown</td>
<td>2.00%</td>
</tr>
</tbody>
</table>

Note. N=320
<sup>a</sup> Participants were all allowed to choose all options that applied therefore totals will not add to 100.
Table 2.
Sample Occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation, maintenance, and repair</td>
<td>1.60%</td>
</tr>
<tr>
<td>Management</td>
<td>9.40%</td>
</tr>
<tr>
<td>Farming, fishing, and forestry</td>
<td>0.60%</td>
</tr>
<tr>
<td>Business and financial operations</td>
<td>10.30%</td>
</tr>
<tr>
<td>Life, physical, and social science</td>
<td>2.50%</td>
</tr>
<tr>
<td>Computer and mathematical</td>
<td>19.40%</td>
</tr>
<tr>
<td>Personal care and service</td>
<td>0.90%</td>
</tr>
<tr>
<td>Architecture and engineering</td>
<td>1.60%</td>
</tr>
<tr>
<td>Healthcare support</td>
<td>4.70%</td>
</tr>
<tr>
<td>Production</td>
<td>2.80%</td>
</tr>
<tr>
<td>Education, training, and library</td>
<td>6.30%</td>
</tr>
<tr>
<td>Building and grounds cleaning and maintenance</td>
<td>0.60%</td>
</tr>
<tr>
<td>Office and administrative support</td>
<td>8.40%</td>
</tr>
<tr>
<td>Legal occupations</td>
<td>2.50%</td>
</tr>
<tr>
<td>Healthcare practitioners and technical</td>
<td>3.10%</td>
</tr>
<tr>
<td>Arts, design, entertainment, sports, and media</td>
<td>3.10%</td>
</tr>
<tr>
<td>Sales</td>
<td>9.70%</td>
</tr>
<tr>
<td>Construction and extraction</td>
<td>3.10%</td>
</tr>
<tr>
<td>Food preparation and serving</td>
<td>3.10%</td>
</tr>
<tr>
<td>Community and social service</td>
<td>2.80%</td>
</tr>
<tr>
<td>Transportation</td>
<td>2.80%</td>
</tr>
<tr>
<td>Unknown</td>
<td>0.63%</td>
</tr>
</tbody>
</table>

Note. N=320
CHAPTER 3:
RESULTS

Preliminary Analysis

Data were examined for quality to ensure the assumptions for multiple linear regression were met. Specifically, the data were examined for outliers, linearity, multivariate normality, multicollinearity, and homoscedasticity. Communication openness exhibited moderate left skew, which may be indicative of employees leaving jobs with supervisors that do not communicate well. All scales had coefficient alphas above .8 and were thus considered adequately reliable. Table 1 and 2 provide the descriptive statistics and the correlations respectively. Because predictors were slightly correlated with each other, multicollinearity statistics were examined during each regression. Variance inflation factor values were all below 1.5 and collinearity tolerance values were all above .6 suggesting that multicollinearity was within the acceptable bounds.

Hypothesis Testing

Hypotheses 1 and 2 concern the relationship between supervisor electronic communication and the two criteria of interest, communication openness and job satisfaction. Each of these was tested using zero order correlations. Hypothesis 1 stated that supervisor electronic communication would be negatively correlated with employee’s perceptions of communication openness and was supported, $r = -.17$, $p<.01$, though the magnitude was small. Hypothesis 2 stated that supervisor electronic communication would be negatively correlated
with employee job satisfaction. This hypothesis was also supported, $r=-.15$, $p<.001$, though the magnitude was again small.

Hypotheses 3, 5, 7, and 9 proposed that individual difference variables, specifically preference for electronic communication, tolerance for ambiguity, extraversion, and technology self-efficacy, moderate the negative relationship between electronic communication and communication openness. These hypotheses were tested using moderated hierarchical linear regression. To accomplish this, the predictor variables were first centered to facilitate interpretation and reduce the impact of multicollinearity (Aiken & West, 1991). Interaction terms were then created using these centered variables. Next the criterion, communication openness, was regressed onto the predictor variables, supervisor electronic communication in Model 1. In Model 2, PEC, tolerance for ambiguity, extraversion, and technology self-efficacy were added to the regression to control for main effects. Finally, I entered the interaction between the individual difference variables and supervisor electronic communication into the equation as a final step to test for moderation.

Table 5 shows the results of the moderated hierarchical linear regression examining predictors of communication openness. The model containing only relationship-oriented electronic communication significantly predicted communication openness ($F(1,307)= 10.95$, $p<.01$) and accounted for 3% of the variance. In Model 2, all four individual difference factors were entered to control for their main effects. The individual difference factors explained additional variance in communication openness, $\Delta R^2=.15 \ F(4,303) = 14.09, \ p<.001$. However, the regression coefficients were only significant for supervisor electronic communication ($\beta=-.14$, $t(303)=-2.41, \ p<.05$), extraversion ($\beta=.21$, $t(303)=3.91, \ p<.001$) and technology self-efficacy($\beta=.23$, $t(303)=4.28, \ p<.001$). Tolerance for ambiguity ($\beta=.10$, $t(303)=1.81, \ p=.06$) and
preference for electronic communication($\beta = -.09$, $t(303) = -1.41$, $p = .16$) had nonsignificant regression coefficients.

Finally, Model 3 contained the interaction terms to test if the specified individual difference variables moderated the relationship between supervisor electronic communication and communication openness. The moderators did not explain additional variance, $\Delta R^2 = .02$, $F(4,299) = 2.28$, $p = .06$, therefore there is no support for Hypothesis 3, 5, 7, or 9. Together, these results suggest that the supervisor’s electronic communication does predict the employee’s perceptions of communication openness, as does the employee’s extraversion and technology self-efficacy. However, characteristics of the employee do not appear to moderate the negative relationship between supervisor electronic communication and perceptions of communication openness.

The remaining Hypotheses, 4, 6, 8, and 10, argue that individual difference factors will moderate the relationship between the proportion of relationship-oriented electronic communication and job satisfaction. This followed the same hierarchical process as previously described and is depicted in Table 6. In Model 1, relationship-oriented electronic communication explained a significant amount of the variance in job satisfaction, $R^2 = .03$, $F(1,307) = 8.96$, $p < .01$ and the addition of the individual difference variables in Model 2 accounted for significantly more variance, $\Delta R^2 = .21$, $F = 21.04(4,303)$, $p < .001$. Interestingly, once the individual difference factors were entered into the model, relationship-oriented electronic communication was no longer a significant predictor of job satisfaction, $\beta = .16$, $t(303) = , p = .32$. This suggests that individual difference factors are better predictors of job satisfaction than the proportion of relationship-oriented communication that is conducted electronically.
Finally, to test if the specified individual difference factors moderated the relationship between the proportion of relationship-oriented electronic communication and job satisfaction, the interaction terms were added. The inclusion of the interaction terms in Model 3 resulted in significantly more variance accounted for in job satisfaction ($\Delta R^2 = .03; p<.05$). However, of the proposed interactions, only the interaction between relationship-oriented communication and tolerance for ambiguity was significant $\beta = .16, t(299), p<.01$. Thus hypotheses 4, 8, and 10 were unsupported.

To visualize the interaction, I graphed the simple slopes one standard deviation above and below the mean (Figure 1). This interaction reflects the relationship proposed in Hypothesis 6. Tolerance for ambiguity appears to moderate the relationship between supervisor electronic communication and job satisfaction such that when the proportion of supervisor electronic communication is high, employees with low tolerance for ambiguity reported lower job satisfaction than employees with high tolerance for ambiguity.

**Supplemental Analyses**

Previous research suggests that the frequency of supervisor communication impacts both the quality of the supervisor-subordinate relationship and affective reactions to the organization (Kacmar, Witt, Zivnuska, & Gully, 2003; Jian & Dalisay, 2017). Thus, it was important to demonstrate that the findings were not explained by the quantity of relationship-oriented communication. Interestingly, in the current study frequency of relationship-oriented communication was positively correlated to both communication openness ($r=.39, p<.001$) and job satisfaction ($r=.34, p<.01$), but not at all correlated to the proportion of electronic communication ($r=0, p=.97$).
To investigate the effect of the frequency of relationship-oriented communication, both interactions were rerun controlling for this variable. The full results are available in Table 7. The frequency of relationship-oriented communication explained a significant amount of the variance in communication openness, $R^2=.15$, $F(1,307)= 53.11$, $p<.00$. However, the proportion of electronic communication that was conducted electronically incrementally predicted communication openness, $\Delta R^2=.03$, $F(1,306) p<001$. Unlike the previous results, the full model including interaction terms predicted incrementally over the model including only main effects, $\Delta R^2=.02$, $F(4,298)=02$, $p<001$.

The only interaction that was significant was the interaction between PEC and the proportion of relationship-oriented communication conducted electronically, $\beta=.15$, $t(299)=2.75$, $p<.01$. Figure 2 visually depicts this interaction at one standard deviation above and below the mean. When the majority of relationship-oriented communication was conveyed electronically, preference for electronic communication did not moderate the relationship with communication openness. However, when the amount of electronic communication was low, individuals that preferred more electronic communication viewed the communication as less open. Thus, this is interaction supports Hypothesis 3.

The frequency of relationship-oriented communication also explains a significant amount of the variance in job satisfaction, $R^2=.12$, $F(1,307)= 41.90$, $p<.00$. However, the proportion of electronic communication that was conducted electronically incrementally predicted job satisfaction, $\Delta R^2=.03$, $F(1,306)=26.58$, $p<.001$. In the full model containing the interaction terms, frequency of relationship-oriented communication remained a significant predictor, $\beta=.29$, $t(299)p<.0001$. Of the proposed interactions, again only the interaction between tolerance
for ambiguity and electronic communication was significant $\beta = .17, p < .01$. The full results can be seen in Table 8.
Table 3. Study Variable Descriptive Statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean(SD)</th>
<th>Min</th>
<th>Max</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of RO Communication</td>
<td>320</td>
<td>2.68 (0.80)</td>
<td>1.00</td>
<td>5.00</td>
<td>0.81</td>
</tr>
<tr>
<td>RO Electronic Communication</td>
<td>320</td>
<td>30.72 (30.99)</td>
<td>0.00</td>
<td>97.00</td>
<td>-</td>
</tr>
<tr>
<td>PEC</td>
<td>320</td>
<td>3.66 (1.39)</td>
<td>1.00</td>
<td>6.00</td>
<td>0.97</td>
</tr>
<tr>
<td>Tolerance for Ambiguity</td>
<td>309</td>
<td>3.62(0.99)</td>
<td>1.17</td>
<td>6.00</td>
<td>0.91</td>
</tr>
<tr>
<td>Extraversion</td>
<td>320</td>
<td>3.29(1.31)</td>
<td>1.00</td>
<td>6.00</td>
<td>0.95</td>
</tr>
<tr>
<td>Technology Self-Efficacy</td>
<td>320</td>
<td>4.66(0.93)</td>
<td>1.20</td>
<td>6.00</td>
<td>0.87</td>
</tr>
<tr>
<td>Communication Openness</td>
<td>320</td>
<td>4.66 (1.17)</td>
<td>1.20</td>
<td>6.00</td>
<td>0.95</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>320</td>
<td>4.18 (0.97)</td>
<td>1.42</td>
<td>6.00</td>
<td>0.96</td>
</tr>
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</table>
Table 4.
Intercorrelations Between Study Variables

<table>
<thead>
<tr>
<th></th>
<th>1 Frequency of RO Communication</th>
<th>2 Electronic RO Communication</th>
<th>3 PEC</th>
<th>4 Tolerance for Ambiguity</th>
<th>5 Extraversion</th>
<th>6 Technology Self-Efficacy</th>
<th>7 Communication Openness</th>
<th>8 Job Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Frequency of RO Comm.</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Electronic RO Comm.</td>
<td></td>
<td>0.00</td>
<td>0.43**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 PEC</td>
<td>0.02</td>
<td>0.43**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Tolerance for Amb.</td>
<td>0.00</td>
<td>0.01</td>
<td>-0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Extraversion</td>
<td>0.21**</td>
<td>-0.09</td>
<td>-0.18**</td>
<td></td>
<td>0.26**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Technology Self-Effic.</td>
<td>0.13*</td>
<td>0.04</td>
<td>0.17**</td>
<td>0.24**</td>
<td>0.12*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Communication Openness</td>
<td>0.39**</td>
<td>-0.17**</td>
<td>-0.14**</td>
<td>0.22**</td>
<td>0.28**</td>
<td>0.27**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Job Satisfaction</td>
<td>0.34**</td>
<td>-0.15**</td>
<td>-0.28**</td>
<td>0.24**</td>
<td>0.31**</td>
<td>0.28**</td>
<td>0.72**</td>
<td></td>
</tr>
</tbody>
</table>

Notes. N=309-320; *p < .05, **p < .01.
Table 5.
Coefficient Estimates for Relationship-Oriented Communication and Individual Difference Factors on Communication Openness

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>SE</td>
<td>β</td>
<td>t</td>
<td>p</td>
<td>b</td>
<td>SE</td>
<td>β</td>
<td>t</td>
<td>p</td>
<td>b</td>
<td>SE</td>
<td>β</td>
<td>t</td>
<td>p</td>
<td></td>
</tr>
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<td><strong>Step 1: Communication</strong></td>
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Notes: \( N=309 \). Both unstandardized (b) and standardized (β) regression coefficients are presented.

* \( p<.05 \), ** \( p<.01 \), *** \( p<.001 \)
Table 6. Coefficient Estimates for Relationship-Oriented Communication and Individual Difference Factors on Job Satisfaction

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Notes: $N=309$. Both unstandardized ($B$) and standardized ($β$) regression coefficients are presented. *$p<.05$, **$p<.01$, ***$p<.001$
Table 7.
Coefficient Estimates for Relationship-Oriented Communication and Individual Difference Factors on Communication Openness Controlling for Frequency of Relationship-Oriented Communication

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**Notes:** N=309. Both unstandardized (b) and standardized (β) regression coefficients are presented.

*p<.05, **p<.01, ***p<.001
Table 8.
Coefficient Estimates for Relationship-Oriented Communication and Individual Difference Factors on Job Satisfaction Controlling for Frequency of Relationship-Oriented Communication

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Notes: N=309. Both unstandardized (B) and standardized (β) regression coefficients are presented.
*p < .05, **p < .01, ***p < .001
Figure 1.
Job Satisfaction Predicted by Relationship-Oriented Electronic Communication and Tolerance for Ambiguity
Figure 2.
Communication Openness Predicted by Relationship-Oriented Electronic Communication and Preference for Electronic Communication
CHAPTER 4: DISCUSSION

Electronic communication is present in our everyday work environments, yet it is primarily studied in globally dispersed teams. Additionally, research has primarily focused on the consequences of being in a highly electronic environment rather than identifying employees who fit within virtual environments. This is of consequence because communication is a process that facilitates other critical processes (e.g. coordination, team monitoring; Marlow, Lacerenza, & Salas, 2017). The style in which managers communicate with subordinates is a vital component in subordinate engagement, job satisfaction, job performance, and organizational commitment (Dasgupta, Suar, & Singh, 2014; Fan & Han, 2018). Thus, it is advantageous for supervisors to understand how their communication may interact with employee characteristics.

The purpose of this study was to investigate the impact of supervisors using electronic means to communicate relationship-oriented information on both subordinate perceptions of communication openness and subordinate job satisfaction. I also investigated if this impact depends on employee individual differences, specifically preferred electronic workstyle, tolerance for ambiguity, extraversion, and technology self-efficacy.

Results of the correlation analyses suggests that, when ignoring all other predictors, the frequency of relationship-oriented communication is the most important predictor of both communication openness and job satisfaction, suggesting first and foremost, supervisors should be having conversations concerning such topics as emotional support and career development with their subordinates, regardless of whether these conversations are held face-to-face or electronically.
Results of the regression analyses demonstrated that higher proportions of electronic communication resulted in lower perceptions of communication openness, even after controlling for the frequency of relationship-oriented communication. This suggests that when supervisors use leaner forms of communication to encourage employees or work on their development, employees perceive the communication as less open. Also, after controlling for frequency of communication, PEC moderated the relationship between electronic communication and communication openness. When supervisors used more face-to-face communication, employees who preferred face-to-face communication viewed the communication as more open than employees who preferred electronic communication.

Results of the regression analyses predicting job satisfaction showed a slightly different pattern. Again, higher proportions of electronic communication resulted in lower perceptions of communication openness, even after controlling for the frequency of relationship-oriented communication. However, the only moderator of this relationship was tolerance for ambiguity. Employees with low tolerance for ambiguity reported less job satisfaction when relationship-oriented communication was predominantly electronic than those with high tolerance for ambiguity. Leaner forms of media, such as email, are more ambiguous than rich media, such as face-to-face communication. It takes more time to reach a shared understanding through electronic than face-to-face communication because critical nonverbal information is missing. Therefore, employees with low tolerance for this ambiguity may be more affected by high amounts of electronic communication and report being less satisfied with their jobs as a result.

Theoretical Implications

Media richness theory argues that the channel of communication should be selected to match the task at hand. Holding more relationship-oriented conversations electronically was
negatively correlated with both employees’ perceptions of the openness of the supervisory communication and with the employees’ job satisfaction. This lends support to the theoretical propositions made by researchers (e.g. Griffith & Neale, 2001; Malhotra & Majchrzak, 2005; Maznevski & Chudoba, 2000) that relational behaviors, such as negotiation and conflict management are best conducted over rich communication environments.

Leaner forms of media are more ambiguous and high use of lean media may decrease the employee’s perception of overall communication openness. Employees may perceive they are missing out on relevant information when supervisors primarily use electronic forms of communication. The regression results suggest that even after controlling for the frequency of relationship-oriented communication, the percentage of that communication that was held electronically predicted variance in both communication openness and job satisfaction.

The full regression models indicate that aspects of the individual appear to be more predictive than electronic communication for the criteria examined. For example, extraversion significantly predicted job satisfaction in the full model and was not moderated by electronic communication. This suggests that individual difference factors such as extraversion are more influential predictors of job satisfaction. This result aligns with previous meta-analytic research that demonstrates extraversion is positively related to job satisfaction ($\rho = .25$; Judge, Heller, Mount, 2002).

Organizations increasingly rely on technology to connect workers, yet there is a lack of research identifying the employee attributes that lead to success in such environments. One of the main goals of this study was to identify individual difference factors that moderate the effects of electronic communication. As researchers build a framework of employee characteristics that fit within virtual environments, tolerance for ambiguity and preference for electronic
communication should be considered. However, the study results suggest that personality factors such as extraversion that have consistently predicted job satisfaction in traditional workplaces are still useful constructs in work environments that employ electronic communication.

**Practical Implications**

Supervisors are often the gateway for critical information and resources that employees need to progress in their career. It is important that employees feel their supervisor is appropriately sharing knowledge with them and that they can share information with their supervisor to discuss topics such as employee development. Supervisors who wish to create environments in which employees are satisfied and feel free to communicate should ensure they prioritize relationship-oriented communication. Though holding these exchanges face-to-face was associated with higher perceptions of communication openness, having these conversations in the first place appears to be the most important factor. Without the appropriate amount of developmental attention from their supervisors, subordinates may be unable to attain the resources they need to succeed, leaving them ultimately dissatisfied with the supervisory relationship and their job.

Both tolerance for ambiguity and preference for electronic communication had small moderating effects on the relationship between electronic communication and the outcomes. This suggests that when there is a choice, supervisors should strive to schedule face-to-face meetings for relationship-oriented conversations, especially when the employee is low in tolerance for ambiguity or prefers face-to-face communication. Organizations strive to select employees based on personality factors that will maximize job performance, fit within their organizational culture, and reduce turnover. Organizations hiring employees who will be required to use technology to communicate with their supervisor may want to consider the employee’s tolerance for ambiguity.
and preference for electronic communication. However, in practicality, the effect of these variables was small when compared to other predictors. Therefore, organizations should prioritize providing supervisors with the incentives and tools necessary to conduct relationship-oriented meetings.

Limitations and Future Directions

When considering the implications of the current study, it is important to acknowledge its limitations. One limitation is its cross-sectional design, meaning that all data were collected at a single timepoint. The relationship with a supervisor is a process that unfolds over time. Attitudes such as job satisfaction and perceptions of communication openness are likely formed after many interactions with the supervisor, which I was unable to capture with my study design. Frequent, face-to-face meetings may be more impactful early in the supervisory relationship when the two members are still building rapport and trying to understand each other’s needs. Future research should employ a longitudinal design and examine, for example, if face-to-face meetings are more critical early in the supervisory relationship than later.

Additionally, the current study did not assess the career stage of employees. Having more frequent, face-to-face mentorship meetings may be more important in early career than later career. Early career employees may crave high quality developmental sessions with their supervisor and be dissatisfied with supervisors that do not prioritize their growth. Employees later in their career may have less need for quality relationship-oriented communication because they have already built the skillset they need to create their organizational network.

An additional study limitation is the self-report data. Objective data on what information is specifically exchanged in electronic communication versus face-to-face communication may shed light on why the electronic exchanges result in lower openness and lower job satisfaction.
For example, people high in preference for electronic communication may not mind sharing their developmental needs with their supervisor over email whereas people low in preference for electronic communication may hesitate to do so. Thus, future research should strive to find the mechanisms underlying this relationship.

Valence of the specific message may also play a role. For example, employees may prefer to receive negative news face-to-face rather than electronically. Electronic messages at work are often timestamped and retained for documentation. Therefore, an employee may feel negative information delivered electronically is part of their permanent employee record and view it as more formal than the same message delivered face-to-face. Particularly if this method of communication is out of norm for the office culture. Therefore, future research should collect information about the message valence and office communication norms to further clarify when electronic communication is most appropriate.

Using only single-source, self-report data also limits our understanding of the supervisor’s perspective. Face-to-face meetings are typically more difficult to schedule than electronic communication, and therefore less desirable for supervisors. Also, supervisors may be willing to invest more time and effort into employees they like or view as high performers. When a supervisor likes an employee, he or she could schedule more face-to-face meetings or impart more high-quality information during relationship-oriented conversations. Thus, future research should consider supervisor preferences as a potential third variable that explains the relationship between the proportion of face-to-face communication and the outcomes of interest.

Conclusions

In summary, this research sought to examine the impact of supervisors using electronic means to communication on relationship-oriented information with their employees. It also
sought to identify individual differences in the employee that moderate the electronic communication-communication openness and electronic communication-job satisfaction relationships. To investigate this issue, I examined four individual characteristics that are theoretically related to job attitudes in virtual environments: tolerance for ambiguity, extraversion, technology self-efficacy, and preference for electronic communication. I found that only tolerance for ambiguity and preference for electronic communication had any moderating effect. Additionally, I found that the frequency of relationship-oriented communication may be the most impactful predictor of both communication openness and job satisfaction.
REFERENCES


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Appendix A: Tolerance for Ambiguity


1 Strongly disagree
2 Disagree
3 Slightly Disagree
4 Slightly Agree
5 Agree
6 Strongly Agree

1. I don’t tolerate ambiguous situations well.
2. I would rather avoid solving a problem that must be viewed from sever different perspectives.
3. I try to avoid situations that are ambiguous.
4. I prefer familiar situations to new ones.
5. Problems that cannot be considered from just one point of view are a little threatening.
6. I avoid situations that are too complicated for me to easily understand.
7. I am tolerant of ambiguous situations.
8. I enjoy tackling problems that are complex enough to be ambiguous.
9. I try to avoid problems that don’t seem to have only one “best” solution.
10. I generally prefer novelty over familiarity.
11. I dislike ambiguous situations.
12. I find it hard to make a choice when the outcome is uncertain.
13. I prefer a situation in which there is some ambiguity.
Appendix B: Extraversion

Instructions:

The following pages contain phrases describing people's behaviors. Please use the rating scale next to each phrase to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence.

1 very inaccurate
2 Moderately inaccurate
3 Slightly inaccurate
4 Slightly accurate
5 Moderately accurate
6 Very accurate

+ keyed

1. Am the life of the party.
2. Feel comfortable around people.
4. Talk to a lot of different people at parties.
5. Don't mind being the center of attention.

– keyed

6. Don't talk a lot.
7. Keep in the background.
8. Have little to say.
9. Don't like to draw attention to myself.
10. Am quiet around strangers.
Appendix C: Preference for Electronic Communication Scale

1 Strongly disagree
   2 Disagree
   3 Slightly Disagree
   4 Slightly Agree
   5 Agree
   6 Strongly Agree

1. I prefer to collaborate with others online.
2. I would rather communicate with my coworkers electronically.
3. My favorite work experiences have involved electronic communication.
4. I prefer to plan with others electronically.
5. I like completing work with others electronically.
6. I prefer to brainstorm with others electronically.
7. Email, texting, and online chats are my preferred methods of coworker communication.
8. My coworkers and friends would describe me as someone who prefers communicating electronically.
Appendix D: Technology Self-Efficacy (TSE)

1 Strongly disagree
2 Moderately Disagree
3 Slightly Disagree
4 Slightly Agree
5 Moderately Agree
6 Strongly Agree

1. When I have to learn a new task that is high tech, my first reaction is that I’m sure I can do it
2. In terms of my ability to learn new tasks that are high tech, I would describe myself as one of the best in my work group
3. In the past, I have had a great amount of experience (either on or off the job) working on high-tech tasks
4. I am extremely confident that I can learn to use computer assisted technology on my job
5. Computer assisted technology will allow me to perform my job better and more efficiency
Appendix E: Supervisor Electronic Communication

Relationship-Oriented Electronic Communication
Supervisors communicate with their employees about different things. Sometimes supervisor communicate with you about relationship-oriented activities such as:

- Conflicts with co-workers
- Performance feedback
- Development
- Building commitment to the team or company
- Encouraging or supporting

Please report the percentage of communication from your supervisor about relationship-oriented activities that occurs via the following communication options. Totals should add to 100%.

1. Face-to-face
2. Video conference
3. Telephone
4. Instant message or text message
5. E-mail
Appendix F: Frequency of Relationship-Oriented Communication

How frequently does your supervisor communicate about the listed relationship-oriented activities?

1. Conflicts with co-workers
2. Performance feedback
3. Development
4. Building commitment to the team or company
5. Encouraging or supporting you
Appendix G: Communication Openness

1 Strongly disagree
2 Moderately Disagree
3 Slightly Disagree
4 Slightly Agree
5 Moderately Agree
6 Strongly Agree

1. It is easy to communicate openly to my supervisor.
2. Communication with my supervisor is very open.
3. I find it enjoyable to talk to my supervisor.
4. When I communicate to my supervisor, there is a great deal of understanding.
5. It is easy to ask advice from my supervisor.
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>I feel I am being paid a fair amount for the work I do.</td>
</tr>
<tr>
<td>2</td>
<td>There is really too little chance for promotion on my job.</td>
</tr>
<tr>
<td>3</td>
<td>My supervisor is quite competent in doing his/her job.</td>
</tr>
<tr>
<td>4</td>
<td>I am not satisfied with the benefits I receive.</td>
</tr>
<tr>
<td>5</td>
<td>When I do a good job, I receive the recognition for it that I should receive.</td>
</tr>
<tr>
<td>6</td>
<td>Many of our rules and procedures make doing a good job difficult.</td>
</tr>
<tr>
<td>7</td>
<td>I like the people I work with.</td>
</tr>
<tr>
<td>8</td>
<td>I sometimes feel my job is meaningless.</td>
</tr>
<tr>
<td>9</td>
<td>Communications seem good within this organization.</td>
</tr>
<tr>
<td>10</td>
<td>Raises are too few and far between.</td>
</tr>
<tr>
<td>11</td>
<td>Those who do well on the job stand a fair chance of being promoted.</td>
</tr>
<tr>
<td>12</td>
<td>My supervisor is unfair to me.</td>
</tr>
<tr>
<td>13</td>
<td>The benefits we receive are as good as most other organizations offer.</td>
</tr>
<tr>
<td>14</td>
<td>I do not feel that the work I do is appreciated.</td>
</tr>
<tr>
<td>15</td>
<td>My efforts to do a good job are seldom blocked by red tape.</td>
</tr>
<tr>
<td>16</td>
<td>I find I have to work harder at my job because of the incompetence of people I work with.</td>
</tr>
<tr>
<td>17</td>
<td>I like doing the things I do at work.</td>
</tr>
<tr>
<td>18</td>
<td>The goals of this organization are not clear to me.</td>
</tr>
<tr>
<td>19</td>
<td>I feel unappreciated by the organization when I think about what they pay me.</td>
</tr>
<tr>
<td>20</td>
<td>People get ahead as fast here as they do in other places.</td>
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<tr>
<td>21</td>
<td>My supervisor shows too little interest in the feelings of subordinates.</td>
</tr>
<tr>
<td>22</td>
<td>The benefit package we have is equitable.</td>
</tr>
<tr>
<td>23</td>
<td>There are few rewards for those who work here.</td>
</tr>
<tr>
<td>24</td>
<td>I have too much to do at work.</td>
</tr>
<tr>
<td>25</td>
<td>I enjoy my coworkers.</td>
</tr>
<tr>
<td>26</td>
<td>I often feel that I do not know what is going on with the organization.</td>
</tr>
<tr>
<td>27</td>
<td>I feel a sense of pride in doing my job.</td>
</tr>
<tr>
<td>28</td>
<td>I feel satisfied with my chances for salary increases.</td>
</tr>
<tr>
<td>29</td>
<td>There are benefits we do not have which we should have.</td>
</tr>
<tr>
<td>30</td>
<td>I like my supervisor.</td>
</tr>
<tr>
<td>31</td>
<td>I have too much paperwork.</td>
</tr>
<tr>
<td>32</td>
<td>I don't feel my efforts are rewarded the way they should be.</td>
</tr>
<tr>
<td>33</td>
<td>I am satisfied with my chances for promotion.</td>
</tr>
<tr>
<td>34</td>
<td>There is too much bickering and fighting at work.</td>
</tr>
<tr>
<td>35</td>
<td>My job is enjoyable.</td>
</tr>
<tr>
<td>36</td>
<td>Work assignments are not fully explained.</td>
</tr>
</tbody>
</table>
Appendix I: Demographics

1. Are you currently employed at a non-Mturk job
   a. Yes
   b. No
2. On average, how many hours do you work per week
   a. Open response
3. How long have you worked with your supervisor?
   a. Less than 3 months
   b. 3 months to 1 year
   c. 1 – 2 years
   d. 2 or more years
4. What percentage of your work week is spent in a different location than your supervisor?
   a. Open response
5. Which of the following best describes your current occupation?
   a. Protective services
   b. Installation, maintenance, and repair
   c. Management
   d. Farming, fishing, and forestry
   e. Business and financial operations
   f. Life, physical, and social science
   g. Computer and mathematical
   h. Personal care and service
   i. Architecture and engineering
   j. Healthcare support
   k. Production
   l. Education, training, and library
   m. Building and grounds cleaning and maintenance
   n. Office and administrative support
   o. Legal occupations
   p. Healthcare practitioners and technical
   q. Arts, design, entertainment, sports, and media
   r. Sales
   s. Construction and extraction
   t. Food preparation and serving
   u. Community and social service
   v. Transportation
6. What is your current age in years
   a. Open response
7. What is your sex
a. Male
b. Female
c. Prefer Not to Answer

8. What race or ethnicity do you identify with (check all that apply)
   a. American Indian or Alaskan Native
   b. Asian
   c. Black/African American
   d. Pacific Islander
   e. Hispanic or Latino
   f. Middle Eastern
   g. White/Caucasian

9. What is the highest degree or level of school you have completed?
   a. No schooling completed
   b. Nursery school to 8th grade
   c. Some high school, no diploma
   d. High school graduate, diploma or the equivalent (e.g. GED)
   e. Some college credit, no degree
   f. Trade/technical/vocational training
   g. Associate degree
   h. Bachelor’s degree
   i. Master’s degree
   j. Professional degree
   k. Doctorate degree
Appendix I: IRB Approval Letter

8/29/2019

Britany Telford
Psychology
4202 E. Fowler Avenue
PCD4118G
Tampa, FL 33620

RE: Exempt Certification
IRB#: Pro00040981
Title: Identifying Employees That Fit with Electronic Communication Styles

Dear Ms. Telford:

On 8/28/2019, the Institutional Review Board (IRB) determined that your research meets criteria for exemption from the federal regulations as outlined by 45 CFR 46.104(d):

(2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects; (ii) Any disclosure of the human subjects’ responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subject’s financial standing, employability, educational advancement, or reputation; or (iii) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by 45 CFR 46.111(a)(7).

As the principal investigator for this study, it is your responsibility to ensure that this research is conducted as outlined in your application and consistent with the ethical principles outlined in the Belmont Report and with USF HRPP policies and procedures.

Please note, as per USF HRPP Policy, once the exempt determination is made, the application is closed in ARC. This does not limit your ability to conduct the research. Any proposed or anticipated change to the study design that was previously declared exempt from IRB oversight
must be submitted to the IRB as a new study prior to initiation of the change. However, administrative changes, including changes in research personnel, do not warrant an Amendment or new application.

We appreciate your dedication to the ethical conduct of human subjects research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

[Signature]

Melissa Sloan, PhD, Vice Chairperson
USF Institutional Review Board