

The Relationship between Employee Use of Communication Technology
and Work-Related Stress:
Does Age Matter?

by


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requirements for the degree of Master of Arts in the Department of Psychology

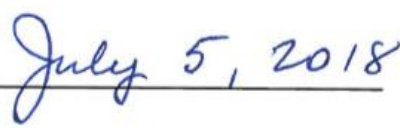
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ABSTRACT

The use of communication technology for work purposes has been steadily increasing in popularity for the last couple decades. Demerouti, Derks, Lieke, and Bakker (2014) found that the rise of technology use in the workplace often resulted in both information overload and social overload. However, technology could also be viewed as a resource. Job Demands-Resources Theory (JD-R) suggests that the negative effects of job demands, such as emotional or physical demands, can be alleviated through the use of job resources. It was expected that employees viewed the use of communication technology for work purposes as either a demand or a resource. It was hypothesized that employees who perceived the use of communication technology for work purposes to be a demand have higher levels of work-related stress. Work-related stress is made up of role ambiguity and role conflict, social support, and balance between work life and home life (Danna & Griffin, 1999). It was found that employees' work-related stress was related to the use of communication technology for work purposes, though not always in the direction that was predicted. Furthermore, it was suggested that age would moderate the relationship between the use of communication technology and work-related stress. It was found that age did moderate the relationship between the use of communication technology for work and certain facets of an individual's level of work-related stress.

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DEDICATION

This thesis is dedicated to my family, who has been a constant source of support and encouragement.

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Chapter 1

Literature Review

Over the past few decades, the rapid development of technology, especially communication technology, has affected both the physical and mental requirements of many jobs. As organizations attempt to improve their profits, they rely on smaller and smaller full-time workforces to produce the same, or even increased, output. Green (2001) found that, though it may appear that the overall number of hours worked has not increased, employees who work under 20 hours has increased, as well as the number of employees who work more than 40 hours per week. The increase in work results in a number of different outcomes for the employee. These include increased time spent completing work tasks, at work or at home, and an increase in the amount of mental or physical energy needed to complete work tasks. The use of communication technology is often the link among these (Burke, Singh, & Fiksenbaum, 2010).

The expansion of work-related demands has received considerable attention, but there is no common framework for understanding it. It may be that work intensification is an escalation in such different areas of work as role stress, time spent completing tasks, and physical or mental effort required to complete tasks. LeFevre, Boxal, and Macky (2015) stated that work intensification is an increase in pressure and expectations on employees during working hours, as well as a demand on personal time.

Additionally, work role stress and non-work role stress are not independent. Negative side effects of work intensification often spill over into an employee's home life (Burke et al., 2010). Cited antecedents for work intensification include human resource

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policies such as high-performance work systems, flexible working (telecommuting), and an improvement in technology.

As there are multiple definitions of work intensification, multiple moderators have also been proposed. LeFevre and colleagues (2015) found that certain individuals were more susceptible to work intensification and its negative consequences. Specifically, it was found that women experience the negative outcomes of work intensification at a higher frequency and intensity than men. Furthermore, it was found that job insecurity moderated the impact between work intensification and the health and well-being of employees (Green, 2004). Other moderators may exist.

This research will focus on the rise of technology within the workplace - specifically, the use of communication technology for work purposes. The proposed relationship between potential benefits and consequences of using communication technology for work will be explored. First, how communication technology is used in the workplace and how employees view it will be considered. Then communication technology's relationship with work-related stress will be examined. Finally, the potential moderating impact of age on that relationship will be discussed.

Work Demands and Communication Technology

Technological improvements have an impact on the way organizations and individuals experience work. One aspect of technology change that has resulted in a large impact on work is communication technology, which is any technology that allows for two or more individuals to communicate with each other. Common types of communication technology that are used for work purposes include smartphones, which

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allow for work-related phone calls and text messages, and laptops, which allow for employees to view and respond to work emails, share documents, and teleconference.

One way that communication technology has influenced work is the ability for employees to telecommute. Telecommuting is a commonly cited antecedent for work intensification. Kelliher and Anderson (2010) found that flexible working practices resulted in work intensification. Those who worked from a location other than an office experienced high levels of isolation and increased stress due to a lack of social support. However, it was also found that flexible working practices, such as telecommuting, resulted in higher levels of job satisfaction and organizational commitment.

Of particular note is that Kelliher and Anderson (2010) found that employees experience work intensification in three ways: as imposed, enabled, and/or reciprocal. “Imposed” intensification happens when employees find that their hours at work have decreased, but their workload has not. “Enabled” occurs when changes, like a lack of distractions, result in an employee working harder more often. Finally, “reciprocal” or “reciprocation” is a sense of obligation that causes increased effort at work. Reciprocation often occurs when employees feel that their employer is allowing them a privilege, such as telecommuting, and the employee feels they must repay them for this. The availability and use of communication technology could be associated with each of these facets of work intensification.

Green (2004) similarly found that work intensification is partially the result of the rise in technology in the work place. The rise in technology has resulted in an increase in efficiency, as well as the rise in managers’ ability to track work. Likewise, Demerouti, Derks, Lieke, and Bakker (2014) identified relatively new technologies, such as

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smartphones, to be related to work intensification through their ability to increase productivity and quicken decision-making when used for work purposes.

Work intensification does not affect every employee equally. Public sector employees are more likely than private sector employees to experience role overload, stress, work-life imbalance, and time demands (LeFevre et al., 2015). The same trend exists between full-time employees and part-time employees, with full-time employees experiencing greater levels of role overload, stress, and work life-imbalance. Those whose jobs are classified as “professional” experience higher levels of job stress when compared to sales and service or technical and trade careers (LeFevre et al., 2015).

Furthermore, Correll, Kelly, O’Connor, and Williams (2014) found that overworking, or working more than 50 hours per week, is becoming increasingly normal, and even expected, in professional jobs. Though overworking can result in pay incentives and consideration for promotions, it also can also adversely affect an employee’s well-being. Overworking has been connected to health issues like heart disease, anxiety, and depression. Greater role overload and time demands have also been associated with fatigue, stress, and work-life imbalance (LeFarve et al., 2015). Moreover, it was found that work intensification resulted in work strain and a decrease in job satisfaction among employees (Green, 2004). Thus, it can be inferred that one of the consequences of work intensification may be a decrease in employee well-being.

Derks and Bakker (2014) found that employees who are highly frequent smartphone users experience higher levels of work home interference and state levels of burnout. Additionally, it was found that employees who went through recovery experiences, which involved separating themselves from work-related phone calls and

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emails at home, experienced lower levels of work home interference, daily exhaustion, and cynicism (Derks & Bakker, 2014).

Though there are many antecedents and consequences to work intensification, this research will focus on communication technology and its connection to work-related well-being and its obverse, stress. The use of communication technology will be considered in terms of two dimensions: the perceived personal pressure to use communication technology and perceived external requirements to use it.

Personal Pressure to Use Communication Technology

Personal pressure to use communication technology results from employees putting pressure on themselves to be connected to technology for the conduct of business. This pressure is the result of an individual's perceived need to respond quickly to communications related to work both during and outside one's typical business hours. Additionally, personal pressure to use communication technology may result in pressure to be connected to a constant stream of information.

External Requirements to Use Communication Technology

External requirements to use communication technology refers to pressure placed on employees by their employers. This may result in employees feeling obligated to respond quickly to communications, such as phone calls and emails, during work hours and outside of work hours.

It may be that both personal pressure and external requirements to use communication technology for work will be related to the experience of work-related stress. As mentioned, not all employees will view communication technology in the same

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way. Some may view communication technology as a demand, while others view it as a resource. This difference may be explained by the Job Demands-Resource Theory.

Job Demands-Resources Theory

The Job Demands-Resources Theory (JD-R) has demonstrated practical application. The JD-R theory makes an argument for how organizations can help to alleviate the negative side effects of job demands. Specifically, the JD-R theory states that work overload, emotional job demands, physical job demands, and work-home conflict all contribute to the likelihood of burnout. However, the JD-R theory proposes that job resources, such as social support and performance feedback, can help to lessen the negative influence of job demands (Bakker & Demerouti, 2017).

Organizations and employees alike have attempted to find a balance between job demands and job resources that will result in both high output and high levels of employee well-being. Tims, Bakker, and Derks (2013) described job resources as policies, procedures, or norms that help employees accomplish tasks, reduce costs or effects of demands, or help personal development. The concept of job demands and their consequences will be explored further, followed by job resources and how they help mediate the effects of those demands.

As previously mentioned, job demands are described as psychological, social, organizational, or physical aspects of a job that require an employee to exert effort. The cost of this effort often results in a depletion of physiological and/or psychological resources. Van den Broeck, De Cuyper, De Witte, and Vansteenkiste (2010) broke down job demands into hindrance job demands and challenge job demands. Hindrance job demands are constraints that inhibit an employee's ability to complete his or her task.

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Alternatively, challenging job demands are often considered positive stressors, such as high levels of workload or responsibility. Challenging job demands are more often linked to positive outcomes, whereas hindrance job demands result in negative outcomes.

Though challenging job demands can be taxing, they may be seen as rewarding in the end.

Originally, the consequences of too many demands and insufficient resources were conceptualized only in terms of employee burnout. However, the theory has progressed and expanded the consequences of too many demands or too few resources to include employee well-being (Bakker & Demerouti, 2014). The JD-R theory explores how job characteristics influence the balance between resources and demands, which, in turn, is related to employee health and well-being (Schaufeli & Taris, 2014). The cost of too many demands and not enough resources includes work overload, employee burnout, and work-home conflict.

Furthermore, Schaufeli and Bakker (2004) found that employee workload and emotional demands were positively correlated with employees' health problems. Schaufeli and Bakker's results suggest that too many demands, such as workload and emotional demands, would result in both employee turnover and health problems. However, it is expected that work resources like social support and feedback may help to buffer the negative consequences of demands from affecting employee health.

There are many ways an employee can experience an imbalance of job demands and job resources. This research will explore how work-related stress can be seen as an antecedent to well-being through the JD-R theory. To begin, the definition of work-related stress will be covered. It is important to note that work-related stress has also been

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referred to as occupational stress. Following the definition, three facets of occupational stress - role ambiguity/role conflict, work-life balance, and social support - within the workplace will be explored.

Occupational Stress

Though it is important to look at the employee from a holistic view, the focus of this investigation is on well-being as a function of an employee's work as proposed by Danna and Griffin (1999). They examined three main antecedents of well-being: work setting, personality traits, and occupational stressors. Occupational stressors include such things as the employee's role within the organization, the balance between home life and work life, and the social support one receives or does not receive from work relationships.

It is important to note that role conflict and role ambiguity have been explored as job demands, whereas social support has previously been defined as a job resource. Work-life imbalance has also been shown to be an outcome of too many demands and not enough resources. Again, the imbalance between job demands and resources is negatively related to an employee's health and well-being.

Specifically, the operationalization of occupational stressors will be used as a multifaceted representation of an employee's well-being and will be referred to as work-related stress. These occupational stressors will be considered in terms of the employee's role in the organization, work-life balance, and relationships at work (Danna & Griffin, 1999). Eventually, strains related to work tasks, work relationships, and the interference of work with non-work responsibilities will be explored in relation to the use of communication technology.

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Role Ambiguity/Role Conflict

Occupational stressors that occur due to the position that an employee holds in the organization can include role ambiguity and role conflict. Role ambiguity occurs when an employee is unsure of the expectations within his/her role. Role conflict is defined as any situation in which an individual, in this case any employee, is asked to play conflicting roles within the workplace. Role problems, such as role ambiguity and role conflict, have been identified as a job demand and were negatively related to overall measures of work performance (Bakker, Demerouti, & Verbeke, 2004).

Furthermore, House and Rizzo (1972) broke down role conflict into four different types: person-role conflict, intersender conflict, intrasender conflict, and overload.

Person-role conflict is the extent to which the role expectations are incongruent with the values of the employee. Intersender conflict occurs when an employee's role conflicts with other employees' roles. Intrasender conflict is when the two or more roles held by a single employee conflict with one another. Finally, overload is when the roles require more time or resources than available (House & Rizzo, 1972). Role conflict and role ambiguity negatively correlate with job satisfaction, job commitment, and job involvement, and positively correlate with tension and anxiety (Danna & Griffin, 1999).

Social Support

Relationships at work include those with superiors, colleagues, and subordinates. Relationships that offer emotional support and positive attachment have been shown to have a positive effect on an employee's well-being and are related to lower levels of illness (Manju, 2018). These relationships can be categorized as "social support." Social

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support comes from the perception that others care for your well-being, can provide assistance, and include you in a supportive network.

The JD-R theory explains that job resources such as social support and performance feedback can help to lessen the negative influence of job demands (Bakker & Demerouti, 2017). Social support has been identified as a job resource that predicts organizational commitment and engagement and has been shown to also be positively related to employee turnover intentions (Bakker & Demerouti, 2014).

Research has identified support within a job as a resource that employees can utilize to reduce the negative consequences of demands. The Job Demand-Control (-Support) model suggests that the negative outcomes that an employee experiences as a result of high levels of job demands can be buffered, or reduced, by high levels of job support. To reduce the negative impact of demands, support can be increased to help avoid experiencing low levels of psychological well-being (Hausser, Mojzisch, Niesel & Scheulz-Hardt, 2010). One strategic way to enhance employee well-being is through human resource practices.

Baptiste (2008) found that human resource management practices that have been shown to have positive performance outcomes for organizations often lead to an increase in trust and social support within the workplace. Increased trust and social support were found to have a positive relationship with employee well-being. Moreover, a common human resource management practice, such as telecommuting, can be great for organizational outcomes, but potentially harmful to an employee's well-being.

When employees telecommute for work, they may experience unanticipated social consequences. Employees often rely heavily on the social support of colleagues in

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order to cope with the demands of their work (Cohen & Wills, 1985). It was found that technology reduces social support within the workplace and breaks down the boundaries between home and work. This could suggest that the use of technology for work purposes could be related to reduced resources or even identified as a demand within itself.

Work-Life Balance

Work-life balance can be explored through its benefits or through the consequences of work-life imbalance, such as work-family conflict. Voydanoff (2004) examined how work demands and resources influence work-family conflict, finding that strain-based demands are related to more frequent incidents of work-family conflict. Voydanoff (2004) suggest that this relationship is due to spillover from work life into family life. Balance between home life and work life can be greatly affected by the spillover of job stress in to an individual's home life. Job stress is a common antecedent to work-family conflict, a form of work-life imbalance. Furthermore, the potential consequences of work-life imbalance are numerous.

Similar to role ambiguity and role conflict, work-life imbalance is highly correlated with emotional exhaustion, a facet of burnout that has been shown to correlate with health problems (Danna & Griffin, 1999; Schaufeli & Bakker, 2004). Furthermore, overwork is often connected to marital conflicts and work-life imbalance. Lapierre and Allen (2016) found that social support and supervisor support are related to lower levels of work-family conflict and higher levels of employee well-being.

Derks and Bakker (2010) found that the use of computer-mediated communication for work purposes can cause the boundaries between work life and home life to blur. Technology is increasingly blurring the lines between work life and home

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life, bending the boundaries between the two domains, resulting in an increase in conflict at home and a decrease in recovery time from work (Nam, 2014). Communication technology for work purposes can also lessen the time that employees are allowed to recover from work life. Recovery from work-related stress has been found to positively correlate with work engagement and proactive behavior (Sonnentag, 2003).

Now that occupational stress and its facets have been explored, a popular definition of well-being will be covered. Following this definition, well-being will be discussed in relation to work and employees. It is important to note that though occupational stress is the way in which this study defines employee well-being, there are many more definitions.

Well-Being

Diener (2009) defined subjective well-being as an individual's cognitive and affective evaluation of his/her life. This can include the examination of life satisfaction, mood, and emotions. Subjective well-being is a very broad concept and is comprised of several domains, including work (Diener, Suh, Lucas, & Smith, 1999). Though a popular definition of well-being, this study more narrowly defines well-being in terms of work-related tasks, interpersonal relations at work, and the balance between work and non-work time. The broader construct of well-being is outside of the range of this research. The Positive and Negative Affect Scale (PANAS) was used to assess an individual's level of affect. This was used as a surrogate for the many other variables that constitute general well-being. Stress, well-being, subjective well-being, work-related well-being, occupational stress, strains, stressors, and work-related stress are all used in this study.

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Though “stress” is a messy construct, the current intent is to reflect affective reactions associated with work.

Work Well-Being

In order to understand how an individual’s work life influences his/her overall well-being, it is important to narrow the definition to well-being that can be tied to the domain of work. In this study, work-related well-being is comprised of work role conflict/role ambiguity social support from work, and work-life balance; this covers task, interpersonal, and spillover consequences of the work domain.

Because well-being can include psychological health, life satisfaction, and physical health, employees who cannot maintain their well-being face individual consequences at home and at work (McKee-Ryan, Song, Wanberg, & Kinicki, 2005). Additionally, there are organizational consequences when employee well-being is ignored. Employees who experience low levels of well-being in the workplace are more likely to make lower quality decisions, have lower productivity, and are more prone to be absent (Danna & Griffin, 1999).

Work demands can have an impact on both short-term and long-term health. However, the type of work demands, such as physical and emotional demands, can also be related to the amount of time that an employee needs to recover from work, as inferred by reports of fewer subjective health complaints (Sluiter, DeCroon, Meijman, & Frings-Dresen, 2003). Effort-Recovery theory suggests that an individual’s health and well-being can be at risk when he/she does not properly recover from work-related stress outside of work hours (Demerouti, Bakker, Geurts, & Taris, 2009). Sonnentag (2003) found that the benefits of employees allowing themselves to recover from work-related

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stress were high levels of work engagement and proactive behavior. Conflict between balancing home life and work life is also related to a decrease in an employee's ability to recover; this decrease is associated with lower levels of well-being (Van Hoof et al., 2005).

Now that the broad concept of well-being, work well-being, and the relationship that work-related stress has with well-being have been discussed, the relationship between technology and the workplace will be explored. This study focuses on how work-life balance, relationships at work, and role ambiguity/role conflict may all be correlated to the use of technology to communicate within the workplace (Jackson & Schuler, 1985).

Technology and the JD-R

Tasks that are considered job demands or job resources are not necessarily mutually exclusive. One employee may define a task as more or less demanding than another. Additionally, an employee can define a task as a demand while another employee views it as a resource. How employees define a task could be related to the effect that that job task has on the employee's experience of stress and, subsequently, his/her well-being as a function of work.

Demerouti et al. (2014) identified relatively new technologies as a job feature that could either be seen as a demand or a resource by employees. They found that when technology, such as smartphones, was used for work purposes, it allowed employees to increase productivity and quicken decision-making. However, some employees may view this technology as an interruption and added pressure to respond quickly.

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Day, Scott, and Kelloway (2010) provided a theoretical framework for how information and communication technology (ICT) can be viewed as both a resource and a demand. Day and colleagues used the job demands-resources model and a transactional model of stress to show that ICT increases flexibility, improves communication, and increases control over an employee's job and life, as well, increasing stress by increasing the expectations placed on the employees (Day et al., 2010; Wang, Shu, & Tu, 2008).

Day et al. (2010) explored how the relationship between ICT and stress can depend on the employee's views of technology as a demand or a resource. Possible moderators for the relationship between the use of technology and consequences could include gender and generational differences. For example, Van Volkom, Stapley, and Amaturio (2014) found that women experience more anxiety towards technology.

Of particular interest in this study, it was found that younger generations held a more positive attitude towards technology and used it more frequently and for longer durations than older generations. However, not all academic literature suggests that there is a generational difference in technology use. There is a popular yet currently unsubstantiated perception that there is a difference in ICT use based upon generational membership (<http://fortune.com/2016/08/07/older-workers-technology/>). The current investigation was designed to assess the veracity of this impression.

Regardless of generational membership, this study will explore how communication technology for work purposes could result in an increase in work-related stress. This relationship should depend on whether communication technology is viewed as a resource or as a demand by the employee. The following sections cover how

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technology specifically can be used as a resource or viewed as a demand, as well as describe its potential benefits and consequences.

Technology as a Resource

Technology seems to function as a job resource in the sense that it assists employees in completing work goals. Organizations must balance resources and demands to help lower the potential for employee burnout and subsequent health problems. Thus, it is necessary to explore what factors may influence whether an employee views technology as a resource or a demand.

Ragsdale and Hoover (2016) found that information and communication technology (ICT) can be one of the job demands that employees view as both a resource and a demand. The researchers demonstrated how work-related cell phone (WRCP) use could be viewed as a job resource by facilitating goal attainment. Ragsdale and Hoover found that the more individuals rely on their work-related cell phone, the lower levels of emotional exhaustion they feel. They suggest this is due to benefits such as access to information and social support (Ragsdale & Hoover, 2016). Wei and Lo (2006) found that the use of cell phones can actually help individuals stay connected socially and maintain a social support system.

Davis (1985) proposed the Technology Acceptance Model (TAM), a cognitive framework that explores how the reactions and perceptions employees hold towards technology and its utility may influence the type of use and frequency of use of the technology. This model can be extended to help evaluate and predict the types of outcomes the organization can expect from the technology (Davis, 1985). For example, organizations that implement systems that require the use of communication technology

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should be aware that these systems are only valued to the extent that an employee accepts and is motivated to use them.

The TAM framework can help explain why some employees utilize technology within their work and some try their best to avoid it. Davis also found that acceptance of technology mediated the relationship between the technology information system characteristics and employee usage. The concepts in Davis' framework, perceived usefulness and ease of use, accounted for the majority of the attitude that employees held towards using the system, thus contributing to the actual use of the system (1985). Employees' perception of technology can influence whether they use it as a resource or view it as a demand. However, this perception can be at least partially attributed to the amount of experience an individual has with technology.

In 2009, the PEW Research Center found that 74% of American adults used the internet. As of 2018, this number increased to 89%. From 2009 to 2018, the number of adults age 18-29 who utilize the internet increased from 81% to 98%. A similar trend was found for adults age 30-49 (81% to 97%) and age 50-64 (70% to 87%). The largest increase can be found in adults 65 years of age or older, increasing from 38% to 66%.

This pattern extends to both the use of broadband internet at home and the use of wireless internet use, with the highest use among adults 18-29 years of age and the least usage in adults 65 years or older. Furthermore, the use increased from 2009 to 2018 for all age ranges (<http://www.pewinternet.org/fact-sheet/internet-broadband/>). Not only do these results suggest that there is a difference in age for internet use, this shows how the use of technology is on the rise across all ages. Though these percentages may seem

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small, they represent hundreds of thousands of individuals and employees and could still have a substantial impact on the workforce as a whole.

The PEW report, in relation to the TAM, could suggest why younger employees may react to communication technology for work purposes differently than older employees. Older employees may view the use of technology to complete a task as another step or skill that they must learn. However, younger employees may view this same technology as a tool, or even a necessary part of their job. This may be partially due to the level of familiarity they have with using this technology.

Due to their proportionally greater exposure to technology, younger employees may hold a more positive perception of WRCP because it is seen as a resource. However, older employees forced to use such communication technology as WRCP may hold a more negative perception of it, leading them to view it as a work demand. As previously mentioned, when employees experience too many job demands and not enough job resources, the results can be detrimental to an employee's health. Employees who experience this decline in health due to an imbalance between demands and resources also experience lower levels of well-being (Bakker & Demerouti, 2014).

Technology as a Demand

Ragsdale and Hoover (2016) discussed ICT in the form of WRCP use that occurs during non-work hours. They broke down how WRCP can be viewed as a demand in three different ways. First, WRCP use provides the employee with access to stress-inducing work demands outside of work hours; this can be considered spillover. The second way in which WRCP can take the form of a demand is when access to work-related information causes an increase in the time spent completing or worrying about

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work when at home. Finally, the level of control that employees feel they have over the use of WRCP can result in its categorization as a work demand. The less control employees feel they have over the use of WRCP, the more it is viewed as a demand (Ragsdale & Hoover, 2016). Macky and Boxall (2008) also found a similar trend with work demands, stating that those employees who have high levels of demand, but low levels of control, experience strain within the workplace.

As demands increase without the benefits of resources, an employee typically experiences higher levels of stress and a decrease in overall subjective well-being. When communication technology is viewed as a demand, the level of organizational stress that an employee experiences is predicted to increase. The rise in demands and decrease in resources are expected to be the outcome of overuse of communication technology for work purposes. In this study, it is expected that as role ambiguity and role conflict increase, occupational stress will increase. Furthermore, as work-life balance and social support increase, occupational stress will decrease. This will ultimately be related to an employee's work-related well-being. It is expected that this relationship will change as a function of the employee's age. The following hypotheses were proposed.

H1a: External requirements to use communication technology at work will correlate positively with employee role-conflict.

H1b: Personal pressure to use communication technology at work will correlate positively with employee role-conflict.

H1c: External requirements to use communication technology at work will correlate positively with employee role-ambiguity.

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H1d: Personal pressure to use communication technology at work will correlate positively with employee role-ambiguity.

H1e: External requirements to use communication technology at work will correlate negatively with employee work-life balance.

H1f: Personal pressure to use communication technology at work will correlate negatively with employee work-life balance.

H1g: External requirements to use communication technology at work will correlate negatively with employee social support.

H1h: Personal pressure to use communication technology at work will correlate negatively with employee social support.

Age

As previously mentioned, there are many factors that contribute to an individual's overall well-being, like physical health and socioeconomic status. However, these individual characteristics do not adequately predict well-being. Mroczek and Kolarz (1998) found that, on average, older individuals experienced higher levels of positive affect when compared to younger individuals. General affective state can be positively associated with well-being. Additionally, Ardel (1997) found that "wisdom" moderates the relationship between age and life satisfaction. Thomas (2010) found that older adults' well-being is positively related to the amount of social support that they give to others within their social network.

It is possible that older employees are more able to balance work and life better than younger employees. The relationship between age and positive and negative affect will be tested. Because general affective state can be linked to well-being, it is useful to

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understand its relationship to age. Due to the lack of support in the empirical literature, an exploratory analysis will be used to explore if age is specifically related to *work*-related stress. This study proposed the following hypotheses.

H2a: Age of participant will be positively correlated with positive affective state.

H2b: Age of participant will be negatively correlated with negative affective state.

It may be suggested that younger employees have had the opportunity to integrate the use of communication technology for a greater proportion of their lives and are more used to adapting to its rapid change compared to older employees. The PEW 2018 data suggest that the absolute amount of exposure does not vastly differ. Still, a 10% difference in millions of employees may matter. It is tentatively hypothesized that internal and external pressure to use communication technology may vary by age.

H3a: Age will be negatively related to personal pressure to use communication technology.

H3b: Age will be positively related to external requirements to use communication technology.

Additional Considerations

Though this study focuses on age, an argument could be made that the potential differences found are related to generational membership. Though the academic literature is split regarding the importance of generational membership on technology use, the popular press is saturated with articles relating the differences back to generational membership (<http://fortune.com/2016/08/07/older-workers-technology/>). The potential differences could be explained by the shared cultural experiences and historical events during their childhood and adulthood. Those shared experiences for younger individuals

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involve a greater portion of their lives exposed to technology. This exposure could result in a more positive attitude toward and higher rates of acceptance of technology.

Employees who are Millennial and younger are considered Digital Natives. These individuals have utilized technology their whole lives. Post-Millennial individuals are considered Digital Immigrants (Prensky, 2001). Organizations have been concerned with generational differences within the workplace in regard to training with technology, among other things (Sipek, 2014). However, this may no longer be a concern. Even over the short period since these references were published, older employees may have adapted. Increased exposure could result in a more positive attitude toward and higher rates of acceptance of technology.

It is therefore hypothesized that age will moderate the relationship between the two types of pressure to use communication technology and work-related stress. This moderation is theorized to be related to differences in generational membership. The full hypothesized framework for this study can be found on Figure 1.1.

Exploratory Hypothesis

H4: The relationship between the use of communication technology in the work place and work-related stress will be moderated by age such that the use of communication technology in the work place and work-related stress will be more positive for older employees than younger employees.

Chapter 2

Method

Participants

A total of 531 participants were recruited through MTURK. Each participant was compensated one dollar. Compensation was partially provided by funds received from a Kemp Award through the Gender Studies Center of Radford University. On average, participants spent roughly 10 minutes to complete the survey. After deleting incomplete survey responses, the sample was narrowed down to 338. Participants were required to be 18 years of age or older and currently employed full-time for at least 1 year.

Procedure

A survey containing 85 items was developed using Qualtrics software for online delivery. MTURK users were given a brief summary of the topic of the survey and an internet research consent form to view before they participated. The survey took approximately 15-20 minutes to complete. The survey was comprised of measures of work-related well-being, communication technology use, age, and demographics. Sections were counterbalanced, but demographic information was always solicited last.

Measures

Demographics

Demographic information was collected from all participants. The primary information requested included hours worked per week, gender, tenure, education, management statuses, position, sector, and union membership were requested. Age and self-identified generational membership were collected for supplementary analyses; see the following sections and Appendix A.

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Age

Participants were asked to report their age, which was also used to assign generational membership, and the generation with which they identified. Parry and Urwin (2010) defined generational groups currently in the workplace as Baby Boomer, 1943-1960; Generation X, 1961-1981; Generation Y (also referred to as Millennial), 1982-2000; and those born after 2000, Generation Z. The item on generational membership was included in the demographics section (see Appendix A).

Use of Communication Technology

The use of communication technology in the workplace instrument had two subscales: one assessing external requirements (perceived pressure) to use communication technology, and one assessing personal pressure (self-imposed) to use communication technology. These were used to encompass the pressure that employers place on employees and the pressure that employees place upon themselves.

External Requirements to Use Communication Technology. The external requirements to use communication technology revolved around the requirements that an organization places upon employees. This measure was adapted from Ukai's instrument on information/communication technology and organizational structure in the workplace (2008; see Appendix B). The instrument was largely reflective of the theme in the original survey; however, items were adapted to better fit this study and for simplicity and clarity: forty irrelevant items were removed. Four items were quantitative and the remaining nine questions used a scale ranging from 1-6, with an option for participants to indicate "N/A." The quantitative items were used to help identify categories for analysis for descriptive purposes. The means of the remaining items were used to reflect a

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participant's overall level of external requirements to use communication technology.

The first two items on the instrument indicated perceptions of time spent on a computer and smartphone for work-related purposes. On these items, 1 indicates "all day" and 6 indicates "none of their day." Responses to these items were reverse-scored to indicate that high scores on perceptions of time spent on work-related communication technology reflected more time.

The next six items described the extent to which communication technology use was perceived to have increased over the past 3 years. This instrument used a 1 to 6 scale, with 1 indicating their use has increased greatly and 6 indicating their use has decreased greatly, with an option for participant to choose "N/A." Finally, the last quantitative question in this instrument related to perceptions of how technology increase has affected the speed at which their company works. This single item used a 1 to 6 scale, with 1 indicating work speed has increased greatly and 6 indicating work speed has decreased greatly. All scales were reverse-scored so that a higher score on the scale, the higher the level of the construct was measured.

Personal Pressure to Use Communication Technology. Personal pressure to use communication technology revolves around an individual's self-imposed work demands. This measure was adapted from Yildirim and Correia's instrument used to measure nomophobia, or the phobia of being detached from mobile information and communication technology (2015; see Appendix C). The original instrument was adapted for content and four items were deleted. Participants were asked to indicate the degree to which they agreed or disagreed with each of the five statements on a 6-point scale ranging from 1, meaning "Strongly Agree," to 6, meaning "Strongly Disagree," with an

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option for participants to select “N/A.” The scale was later recoded so that high scores on this scale indicate high levels of personal pressure to use communication technology. An example item includes “I would feel uncomfortable without constant access to information through my smartphone”

Occupational Stress

Occupational stress was measured using the three dimensions that make up work-related well-being, as defined by Danna and Griffin (1999): work-life balance, relationships at work, and role ambiguity/role conflict. Role ambiguity and role conflict were separate subscales. Each of the following indicators of work-related well-being were coded so that higher scores reflect higher work-related stress.

Work-Life Balance. Work-life balance was defined using the employees’ perceptions of how well their organizational culture promotes healthy boundaries between home-life and work-life. Work-life balance was measured using the Work-Life Balance Culture Scale (WLBCS; see Appendix D). This instrument included five items. A sample item was “My company values measures to promote employee work-life balance.” Answers range from 1 to 6, with 1 meaning “Strongly Agree” and 6 meaning “Strongly Disagree,” with an option to select “N/A”. High scores on the WLBCS indicate low levels of work-life balance culture. All scales were recoded so that the higher score indicated stronger work-life balance culture. The WLBCS has a Cronbach’s alpha of .82 (Nitzsche, Jung, Kowalski, & Pfaff, 2014). Bell, Rajendran, and Theiler (2012) found a negative relationship between work-life balance and job stress.

Social Support. Social Support at work was defined as the extent of social support received within the workplace and measured with Caplan, Cobb, French, Van

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Harrison, and Pinneau's (1975) 12-item measure (see Appendix E). The items labeled (1A, 2A, 3A, 4A) constitute the Social Support from Supervisor Index. Similarly, the items labeled B and C constitute the Social Support from Others at Work Index and the Social Support from Partner, Friends and Relatives Index, respectively.

Responses were obtained on a 5-point scale measuring frequency. Scores range from 4 meaning "very much" to 1 meaning "not at all," with an option for "N/A" for those individuals who do not have such a person. High scores on social support scale were reverse scored to indicate high levels of social support. Measure includes items such as "How much can you rely on your immediate supervisor when things get tough at work?" The supervisor support and co-worker support subscales had a coefficient alpha ranging from .86 to .91 and the subscale for friend/family support coefficient alpha was .73, making the combined measure's coefficient alpha .83 (LaRocco, House, & French, 1980). Subscales were combined to reflect overall support and also broken down into three subscales to explore the differences between social support at work and social support at home. LaRocco et al. (1980) found evidence that social support is related to both mental and physical health variables.

Role Conflict/Role Ambiguity. Role conflict was defined as incongruity of perceptions or performance and role ambiguity was defined as the clarity of job requirements. Role ambiguity and role conflict were measured using Rizzo, House, and Lirtzman's (1970) Role Questionnaire. The role conflict sub-scale had eight items (see Appendix F) and the role ambiguity sub-scale consisted of five items (see Appendix G). Response ranged from 1, meaning "strongly agree," to 6, meaning "strongly disagree," with an option to select "N/A." Six items were reverse coded. A sample item for role

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conflict included “I work with two or more groups who operate quite differently.” High scores on the role conflict instrument indicate a high level of role conflict. A sample item for role ambiguity that was reverse coded includes “I know exactly what is expected of me.” After recoding, high scores on the role ambiguity instrument indicate greater role ambiguity. Cronbach’s alpha for the role ambiguity sub-scale ranged from .780 to .808, and role conflict ranged from .816 to .820 (Rizzo et al., 1970). Hamner and Tosi (1974) provided evidence that role conflict and role ambiguity were positively related to an employee’s anxiety.

Positive and Negative Affect Scale (PANAS)

The PANAS was used as a broad index of general affective state. This instrument is comprised of two independent sub-scales: positive and negative affect. Schaufeli and Bakker (2004) supported this independence as well as the instrument’s relation to well-being. Positive affect was defined as the extent to which an individual feels pleasurable engagement. Negative affect was defined as the extent to which an individual feels subjective distress. Positive affect and negative affect were measured using Watson, Clark, and Tellegen’s (1988) scale (see Appendix H). Participants were given both positive affect and negative affect subscales and asked to indicate to what extent they have felt this way in the last year. Scoring ranged from 1-5, where 1 meant “very slightly or not at all,” and 5 indicated “extremely.” High scores on the positive affect subscale indicated high levels of positive affect. High scores on the negative affect subscale indicated high levels of negative affect. This scale included 10 items that were directed at positive affect, like “interested,” and 10 items that were directed at negative affect, like “irritable.” The alpha values for the positive affect subscale fall between .86 and .90. The

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alpha values for the negative affect subscale fall between .84 and .87 (Watson et al., 1988). This measure was used to explore the extent to which positive affect and negative affect correlate with age of participants.

Perceptions of Demands and Resources from the Use of Communication Technology

Two items were created in order to obtain perceptions of communication technology of participants (see Appendix I). These items measured the extent to which the participants perceive that increases in communication technology improve their well-being by acting as a resource or decrease their well-being by being a demand. Each item is measured on a 1 to 6 scale, with 1 being “strongly agree” and 6 being “strongly disagree.” This scale was recoded so that a higher score on the instrument indicates a higher level of demand/resource.

Chapter 3

Results

Demographic and descriptive analyses can be found in Table 1.1. The reduced sample included 210 males and 128 females. Participants' age ranged from 18 to 65 years old, with an average age of 31. Thirty-five participants reported working less than 34 hours and were therefore removed from analyses. One hundred and fifty-five participants reported working 34-40 hours, 130 participants reported working 41-50 hours, and 18 reported working 51 hours or more a week. Seventeen participants identified as Generation Z, 247 participants identified as in the Millennial generation, 62 participants identified as Generation X, 10 identified as Baby Boomers, and 1 participant chose not to answer.

Prior to hypothesis testing, the qualitative variables were explored to help understand the various modes of communication technology used by the sample, how communication technology affected the speed of work, and whether it was perceived as a demand or as a resource. Following those analyses, hypothesis testing was conducted. Finally, analysis for the supplementary hypothesis was completed.

Participants were asked to indicate how they communicate within their organizations, with other companies, and with customers. The majority of participants indicated that they communicate through in-person meetings ($M = 2.15$, $SD = 1.08$), meaning the average participant utilized in-person meetings to communicate with two out of the three groups: within their organization, with other companies, and with customers. In-person meetings was followed by phone ($M = 1.85$, $SD=1.02$) and email ($M = 1.55$, SD

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= 1.29). The means and standard deviations for the indicated types of communication technology used are listed in Table 2.1.

When asked about how technology has affected the speed at which they work, the majority of participants indicated that technology has increased the speed ($N = 185$) versus those who believed it decreased work speed ($N=24$). These results are represented in Figure 2.1. Furthermore, the majority of participants at least somewhat agreed that they view technology as a demand that impacts their well-being ($N = 174$) versus those who disagreed ($N = 166$). However, the majority of participants also indicated that they at least somewhat agree that they utilize technology as a resource ($N = 282$) versus those who disagreed ($N = 56$). These results are represented in Figure 3.1 and Figure 4.1, respectively.

Main Analyses

Hypothesis 1

Pearson correlations were used to test Hypothesis 1. All p values are two-tailed. The relationship between the subscales of work-related stress were correlated with both types of pressure to use communication technology scales: personal pressure and external requirements.

Hypotheses 1a-d measured how role conflict and role ambiguity relate to the participants' use of communication technology. As predicted, role conflict ($M = 3.42$, $SD = 1.16$) was positively correlated with external requirements to use communication technology ($M = 3.57$, $SD = .65$; $r(228) = .419$, $p < .001$). Role conflict was also positively related to personal pressure to use communication technology ($M = 3.97$, $SD = 1.17$; $r(331) = .379$, $p < .001$). Furthermore, role ambiguity ($M = 2.50$, $SD = .98$) was

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also related to both external and personal pressure to use communication technology. However, this relationship was negative for both external requirements ($r(331) = -.482, p < .001$) and personal pressure to use communication technology ($r(228) = -.120, p < .05$).

Hypothesis 1e stated that the external requirements to use communication technology at work would correlate negatively with employees' perceived level of work-life balance. The relationship between external requirements to use communication technology was related to work-life balance ($M = 4.18, SD = 1.15$), but positively ($r(228) = .435, p < .001$). Hypothesis 1f stated that the personal pressure to use communication technology at work would correlate negatively with employees' perceived level of work-life balance. Contrary to prediction, personal pressure to use communication technology was positively related to work-life balance ($r(331) = .261, p < .001$).

Hypotheses 1g-h stated that the use of communication technology at work would correlate negatively with employees' perceived level of social support at work. Social support is constructed of co-worker support, supervisor support, and family/friend support scores ($M = 2.96, SD = .55$). Social support was positively related to both external requirements ($r(320) = .419, p < .001$) and to personal pressure to use communication technology ($r(228) = .219, p < .001$). Both results were contrary to predictions.

Similarly, the three social support subscales (support from supervisors, support from co-workers, and support from friends and family) were all positively related to both external requirements and personal pressure to use communication technology. For social support from supervisors ($M = 2.80, SD = .74$), the relationship with external

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requirements was $r(224) = .306, p < .001$, and with personal pressure it was $r(327) = .150, p < .001$. For social support provided by co-workers ($M = 2.87, SD = .64$), the relationship with external requirements was $r(224) = .369, p < .001$, and the relationship with personal pressure to use communication technology was $r(327) = .213, p < .001$. Finally, the relationship between support provided by friends and family ($M = 3.18, SD = .72$) and external requirements was $r(227) = .355, p < .001$; for personal pressure to use communication technology, it was $r(326) = .137, n.s.$

Hypothesis 2

Hypothesis 2, regarding the relationship between age and affect, was analyzed using the PANAS and participants' self-reported age in years. Pearson correlations were conducted between age and each subscale of the PANAS. There was no relationship between the positive affect subscale of the PANAS ($M = 3.35, SD = .84$) and age ($M = 31.81, SD = 8.17; r(335) = .044, n.s.$). However, age was negatively related to the negative affect subscale of the PANAS ($M = 2.09, SD = .97, r(336) = -.334, p < .001$).

Hypothesis 3

Hypothesis 3a stated that age will be negatively related to personal pressure to use communication technology. Personal pressure to use communication technology ($M = 3.97, SD = .65$) and age ($M = 31.81, SD = 8.17$) were negatively related ($r(331) = -.167, p < .05$). Hypothesis 3b stated that age will be positively related to external requirements to use communication technology. There was no relationship between age and external requirements to use communication technology ($M = 3.57, SD = .65; r(338) = -.082, n.s.$).

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Exploratory Hypothesis

Hypothesis 4, the exploratory hypothesis, concerned the moderating influence of age on the relationship between the perceived pressure to use communication technology and an individual's level of work-related stress. It was tested using a set of moderated multiple regressions. Interaction terms between external requirements to use communication technology and age, and between personal pressure to use communication technology and age, were generated. Despite the fact that age is a continuous variable, all figures reflecting significant interactions in the moderated regressions were graphed on dichotomizing age by a meaningful "generational" divide. In this case, the divide was between Millennial and younger employees (< 37) and post-Millennial (≥ 37). This will be considered in the discussion. The interaction terms and variances explained reported in Table 4.1, however, retained the more appropriate level of measurement for age.

Main effects of age and external requirements to use communication technology, and then between main effects of age and personal pressure to use communication technology, were entered prior to testing the interaction between perceived pressure and age in each regression. Specifically, the interaction between external requirements to use communication technology and age was tested for each work-related dependent variable. Similarly, the interaction between personal pressure and age was also tested for each work-related stressor. Thus, a total of eight moderated regressions were performed.

Although the overall models for all regressions were significant, the interactions between external requirements and age for role conflict ($F(1, 226) = .43, n.s.$), external requirements and age for social support ($F(1, 220) = .37, n.s.$), and external requirements

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and age for work-life balance ($F(1, 226) = 3.13, n.s.$) were not significant. Refer to Table 4.1 for a summary.

The interaction between personal pressure and age for role conflict ($F(1, 331) = 4.71, p = .031, \Delta R^2 = .012$) was significant. The hypothesis was partially supported in that the relationship between the independent variables was more positive for younger employees, but relatively flat for older employees; see Figure 5.1. As self-imposed pressure increased, reports of role conflict increased for those younger than 37.

The interaction between personal pressure and age for role ambiguity ($F(1, 330) = 6.25, p = .013, \Delta R^2 = .018$) was significant. For participants who were 37 and older, the relationship between role ambiguity and personal pressure was flat. For individuals who were younger than 37, the relationship between role ambiguity and personal pressure was negative; see Figure 6.1. This hypothesis was not supported; younger employees reported that personal pressure was negatively related to role ambiguity. No direction can be stated for older employees.

The interaction between personal pressure and age for social support ($F(1, 318) = 12.34, p = .001, \Delta R^2 = .035$) was significant. The relationship between social support and personal pressure was positive for participants who were younger than 37. For participants who were 37 and older, the relationship between social support and personal pressure was flat; see Figure 7.1. This hypothesis was partially supported. Contrary to prediction, there was no relationship between personal pressure and social support for older employees and the relationship between the two independent variables was positive for younger employees.

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The interaction between personal pressure and age for work-life balance ($F(1, 329) = 6.60, p = .011, \Delta R^2 = .018$) was significant. The relationship between work-life balance and personal pressure was positive for younger participants, but relatively flat for older participants; see Figure 8.1. This hypothesis was partially supported in that the relationship between the variables was positive for younger employees, but not for older employees.

The interaction between external requirements and age for role ambiguity accounted for a significant amount of variance ($F(1, 226) = 5.25, p = .023, \Delta R^2 = .017$). Contrary to prediction, the relationship between role ambiguity and external requirements was negative for younger employees; however, for employees 37 and older, the relationship was flat; see Figure 9.1. The statistics for all the preceding moderated regressions are reported in Table 4.1.

Chapter 4

Discussion

To begin, qualitative data regarding the perceived use of communication technology will be reviewed. Next, primary and exploratory hypotheses will be considered. Finally, limitations and future directions will be discussed.

As previously stated, the majority of participants (66%) agreed with the proposition that the increased use of technology is a potential antecedent to work intensification. Furthermore, communication technology makes up two of the three most common forms of communication that employees use to spread information at work. Finally, the majority of participants agreed that the use of technology for work purposes was perceived as both a demand (51%) and a resource (83%). Clearly, most respondents considered communication technology as a resource, while fewer considered it a demand. This is also supported in academic literature (Demerouti et al., 2014).

Results partially support the hypotheses. Hypotheses 1a-1b, which stated that role conflict would be positively related to perceived external requirements and perceived personal pressure to use communication technology, were supported. As the perceived external requirement and personal pressure to use it increased, so did role-conflict. Perhaps communication technology expands our responsibilities to the point that it makes us try to keep too many balls in the air simultaneously.

However, the remaining simple correlations between perceived external requirements and personal pressure to use communication technology with role ambiguity, work-life balance, and social support were all significant, but in the opposite direction to the prediction. The relationship between external requirements and personal

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pressures to use communication technology with role ambiguity was negative, particularly so for perceived external requirements. External requirements' and personal pressures' relationship with work-life balance and social support were positive. Again, the relationship was stronger with external requirements. Why might that be?

Overall, increased external requirements and personal pressure to use communication technology may decrease a sense of role ambiguity because employees have greater access to information regarding their roles and can clarify uncertainties more quickly. In turn, the positive relationship between external requirements and social support and between perceived personal pressure and social support may, in the current sample, be explained by technology's inclination to expand social networks. A similar explanation may apply to work-life balance. Contact between these realms has been made more convenient.

Hypothesis 2 tested the relationship between age with positive and negative affect. Hypothesis 2a showed that age and positive affect were unrelated. Positive affect may not have been related to age due to the "trait-like" terms in the PANAS (Schmulke, Egloff, & Burns, 2002). Furthermore, it is possible that the positive affect subscale of the PANAS constitutes separate factors, explaining why positive affect was not significant, but negative affect was weakly significant (Egloff, Schmulke, Burns, Kohlman, & Hock, 2003). However, Hypothesis 2b found that age was negatively related to the negative affect subscale of the PANAS. The reporting period requested was for "over the past year," which may have made the respondents perceive the items as traits rather than states.

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Hypothesis 3a stated that age will be negatively related to personal pressure to use communication technology and was weakly supported. However, Hypothesis 3b stated that age will be positively related to external requirements to use communication technology and it was not supported. The lack of support for Hypothesis 3b could be partially due to methodology; specifically, the survey was conducted via technology and there was a lack of older participants. There were an overwhelming number of Millennial participants within this study and very few participants over the age of 60. As proposed, older employees were expected to experience a greater amount of external pressure to use communication technology. There may simply not have been enough post-Millennial participants to test. Furthermore, it may well be that younger respondents are quite tech-savvy, but the organizations for which they work are not. There was no assessment of the sophistication of the work technology available to respondents included in the study. Workplace technology may not have progressed with its availability; it is costly.

Hypothesis 4, the exploratory hypothesis, tested age as a moderator for the relationship between the use of communication technology for work purposes and work-related stress. The overall models for all regressions were significant, but the interaction between external requirements to use communication technology and age for role conflict, social support, and work-life balance were not.

However, there was an interaction between external requirements and age for role ambiguity. For younger employees, the relationship between role ambiguity and external requirement was negative. As the perception of the external requirement to use communication technology increased, role ambiguity decreased for younger employees.

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For post-Millennial employees, no relationship was observed. This will be further discussed.

The lack of relationship for older employees could be due to a number of limitations within this study and its sample. There were not enough post-Millennial respondents to test the hypothesis. However, it is also possible that older employees do not feel that work-related expectations to use communication technology are related to their level of role ambiguity.

The interactions between personal pressure and age for role conflict, role ambiguity, social support, and home-life balance were all significant, but they did not support the hypotheses in any systemic manner. One possible explanation was a sampling bias within the study. The vast majority of respondents were less than 37 years old. These participants could potentially view and use technology differently, as compared to older participants (Day et al., 2010).

As previously stated, the differences in use and acceptance of technology between participants was expected to be related to whether an individual perceives communication technology as either a demand or a resource. It is possible that these participants have a higher level of use and acceptance of technology than the population. This could ultimately result in the view of technology as a resource and subsequently lower their levels of work-related stress.

For the interaction between personal pressure and age for role ambiguity, no relationship was found for participants 37 and older. For participants younger than 37, as personal pressure increased, role ambiguity decreased. The same relationship can be found in the interaction between external requirement and age for role ambiguity. As

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previously stated, communication technology was used by the majority of participants to spread information within organizations. The use of communication technology for work purposes could help to clarify any uncertainty that an employee has within his/her role in the workplace.

Similarly, the interaction between personal pressure and age for role conflict, social support, and work-life balance were all significant. As personal pressure increases, role conflict, social support, and work-life balance all increase for individuals younger than 37. However, for those 37 and older, there was no significant relationship found for any of the interactions. This hypothesis was partially supported in that the relationship between the variables was positive for younger employees, but nonsignificant for older employees. Again, the lack of relationship found for participants 37 and older could have been due to the lack of participants within that age group.

Hypotheses 1a-h provided evidence that there could be a connection between external requirement and personal pressure to use communication technology and the facets of work-related stress. However, Hypothesis 3b and the exploratory hypothesis overall do not support the hypothesized moderating effect of age. Overall, the hypothesized framework for this study is not supported.

Implications

The use of communication technology for work purposes and employee well-being are relevant topics, both within academic literature and popular press articles, and have practical implications. This study contributes to the literature by providing insight into potential antecedents of work-related stress.

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When organizations are better able to predict employees, they can better target those individuals for interventions. This could allow for more effective interventions, ultimately save organizations money both in the number of interventions needed and the effectiveness of the intervention. Finally, understanding work-related stress and overall subjective well-being is important for preventing absenteeism, turnover, and health costs associated with the resulting negative health outcomes (Danna & Griffin, 1999; Sluiter et al., 2003).

The current study attempted to expand upon the framework Day et al. (2010) created relating technology, the JD-R, and strain. This study alters the existing framework from strain to work-related stress and added age to the list of potential moderators of the framework. Though many of the current hypotheses were not supported, the information that came out of the study can still be useful. Furthermore, though many of the predicted hypotheses were not supported, this could be due to the study's numerous limitations.

Limitations and Future Directions

Overall, this study has a number of limitations. A large limiting factor of this study was the sampling bias, since this study used technology to assess the use of technology. MTURK was used due to its ability to recruit a diverse sample. Specifically, for this study, it was critical that the sample had a diverse age. However, utilizing technology as the means of distribution for the survey may be a self-selection bias and could have influenced the participants' familiarity level with technology and frequency of use. The individuals who participate in MTURK are likely individuals who are already familiar with technology. As previously mentioned, when participants accept technology,

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they are more likely to utilize it. Davis' TAM (1985) would suggest that the individuals who utilize MTURK have a high level of acceptance for technology.

In addition, several other issues come to mind. There was potentially a common method bias. Participants could have come from different countries that have different cultures and potentially different relationships with work and technology. Other limitations include the attrition rate of participants being quite high. Nearly half of the data collected was omitted due to incomplete responses. The lack of age diversity made it difficult to draw conclusions regarding age-related differences in communication technology use for work purposes. Though there is theory behind the potential differences in communication technology, this relationship could not be fully tested in this study due to the lack of diversity in participant age. Similarly, the age cutoff of 37 and older for the exploratory hypothesis was not based on the mean or median of the sample, but based upon Generational Membership Theory. This age cutoff put Generation Y and Millennial into one group and Generation X and Baby Boomers into another. Based upon Generational Membership Theory, these two groups were expected to view technology differently. Though theoretically based, this cutoff point resulted in disproportional group sizes and rendered some analysis more susceptible to both Type I and Type II errors.

Given the number of variables being correlated in this study, it is possible that some results were due to spurious correlations. Though some results are likely due to chance, it is not clear which ones. Furthermore, the effect size of the critical interactions were small. Finally, this data was collected at a single time point and is, therefore, unable to determine causality; these correlations do not equate to causation.

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Moving forward, the purposed framework should include generational membership and should be tested utilizing a sample that more accurately represents the population. This sample should include a more representative proportion of Generation X and Baby Boomers. Recruitment for and administration of the survey should be done both with and without using technology in order to have a more representative sample of use and acceptance of technology. Finally, future research should use multiple time points in order to be able to explore the directionality of the model.

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Table 1.1 Demographics

Demographics	N	%
Gender		
Female	128	37.87%
Male	210	62.13%
Prefer not to answer	0	0%
Hours Worked Per Week		
1-34 hours	35	10.36%
35-40 hours	155	45.86%
41-50 hours	130	38.46%
51 hours or more	18	5.33%
Tenure		
Less than 1 years	30	8.88%
1-3 years	136	40.24%
4-7 years	111	32.84%
7-10	27	7.99%
Over 10 years	34	10.06%
Education		
High school diploma	19	5.6%
Associate's degree	31	9.2%
Some college	38	11.2%
College diploma	200	59.2%
Master's or Doctoral	50	14.8%
Management Statues		
Worker	169	50%
Manager	169	50%
Organization Size		
25 or fewer	52	15.38%
26-75	87	25.74%
76-150	62	18.34%
151-500	75	22.19%
501 or more	62	18.34%
Profession		
Professional	177	52.4%
Technical and Trade	75	22.2%
Sales and Service	79	23.4%
Other	7	2.1%

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Table 1.1 Demographics, continued

Demographics	N	%
Union Membership		
Union	103	30.47%
Non-Union	235	69.53%
Generational Membership		
Baby Boomer	10	2.96%
Generation X	62	18.34%
Generation Y (Millennial)	247	73.08%
Generation Z	17	5.03%

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Table 2.1 Means and Standard Deviation for Types of Communication Technology Used

External Variables	M	SD
Meetings are conducted face-to-face	2.15	1.08
Meetings are conducted by phone	1.85	1.02
Meetings are conducted by video conference	1.15	1.10
Information delivered by mail	1.05	1.07
Information delivered by fax	.50	.84
Information delivered by email	1.55	1.29

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Table 3.1 Intercorrelations Between Study Variables

	M	SD	1	2	3	3A	3B	3C
1. Role Conflict	3.42	1.16	.908					
2. Role Ambiguity	2.50	.98	.183**	.887				
3. Social Support	2.96	.55	-.097	-.493**	.851			
3A. Social Support Supervisors	2.80	.74	-.045	-.462**	.775**	.814		
3B. Social Support Co-Workers	2.87	.64	-.059	-.397**	.843**	.532**	.756	
3C. Social Support Friends	3.18	.72	-.131*	-.315**	.742**	.273**	.492**	.804
4. Work/Life Balance	4.18	1.15	.066	-.487**	.431**	.491**	.403**	.112
5. External Pressure	3.57	.65	.419**	-.482**	.419**	.306**	.369**	.355**
6. Personal Pressure	3.97	1.17	.379**	-.120*	.219**	.150**	.213**	.137*
7. JD-R Demands	3.42	1.55	.598**	.018	.042	.067	.086	-.080
8. JD-R Resources	4.43	1.15	.129*	-.300	.365**	.267**	.273**	.302**
9. Age	31.81	8.17	-.245**	-.095	.087	.025	.032	.175**
10. PANAS Positive Affect	3.35	.84	-.085	-.378**	.297**	.267**	.273**	.180**
11. PANAS Negative Affect	2.09	.97	.498**	.143*	-.124*	.032	-.026	-.313**

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Table 3.1 Intercorrelations Between Study Variables, continued

	4	5.	6.	7.	8.	9.	10.	11.
4. Work/Life Balance	.916							
5. External Pressure	.435**	.775						
6. Personal Pressure	.261**	.458**	.891					
7. JD-R Demands	.188**	.460**	.276**	-				
8. JD-R Resources	.290**	.423**	.424**	.051	-			
9. Age	-.126*	-.082	-.167**	-.222**	.009	-		
10. PANAS Positive Affect	.247**	.149*	.086	-.028	.281**	.044	.909	
11. PANAS Negative Affect	.004	.155*	-.167**	.453**	.032	-.334**	-.012	.946

Note. *indicates a significant correlation at the $p < .05$ level, ** indicates a significant correlation at the $p < .001$ level; all p values even two-tailed. Cronbach's alpha is reported along the diagonal, where appropriate.

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Table 4.1 Moderated Multiple Regression Main Effect and Interaction

DV	IV	Beta	R ² Change	F Change	P Change	R ²	F Overall	p Overall
Role Conflict	External	-.264						
	Age	-.426	.217	31.48	.001	.217		
	External x Age	.237	.001	.430	.512	.219	21.08	.001
Role Conflict	Personal	.741						
	Age	.124	.182	36.652	.001	.182		
	Personal x Age	-.485	.012	4.712	.031	.186	26.28	.001
Role Ambiguity	External	.935						
	Age	-.795	.249	37.572	.001	.249		
	External x Age	.803	.017	5.245	.023	.266	27.265	.001
Role Ambiguity	Personal	-.633						
	Age	-.484	.023	3.808	.023	.023		
	Personal x Age	.609	.018	6.254	.013	.041	4.664	.003
Social Support	External	-.571						
	Age	.360	.206	28.713	.001	.206		
	External x Age	-.224	.001	.372	.542	.208	19.21	.001
Social Support	Personal	.906						
	Age	.658	.054	9.111	.001	.054		
	Personal x Age	-.841	.035	12.336	.001	.081	10.40	.001
Home/Work Balance	External	-.811						
	Age	.498	.235	34.942	.001	.229		
	External x Age	-.629	.010	3.134	.078	.236	24.56	.001
Home/Work Balance	Personal	.732						
	Age	.263	.089	16.157	.001	.089		
	Personal x Age	-.603	.018	6.599	.011	.107	13.15	.001

Notes. *df* range from (2,223) to (2,332) for the first step of the model. *df* range from (1,223) to (1,332) for the second step of the model. *df* range from (3,321) to (3,332) for overall model.

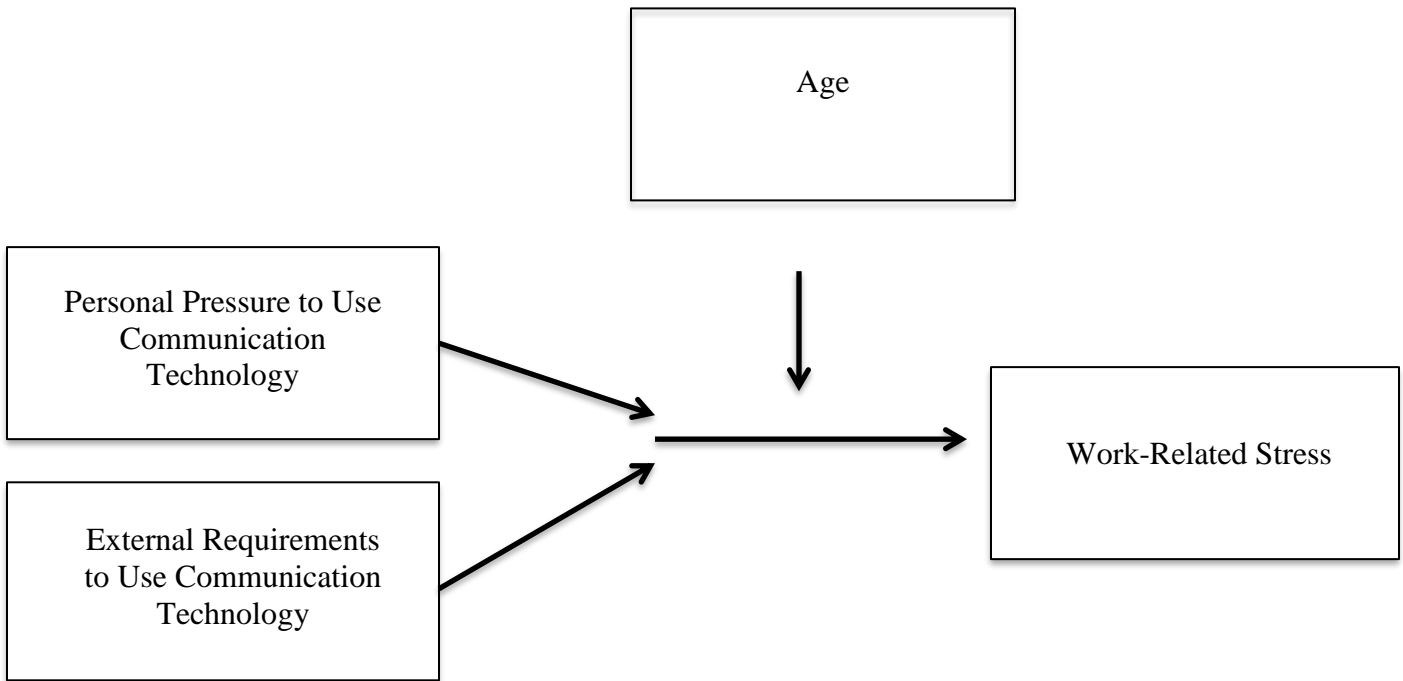
-Step one contains main effects, step two is the interaction term.

-Personal Pressure to Use Communication Technology

-External Requirements to Use Communication Technology

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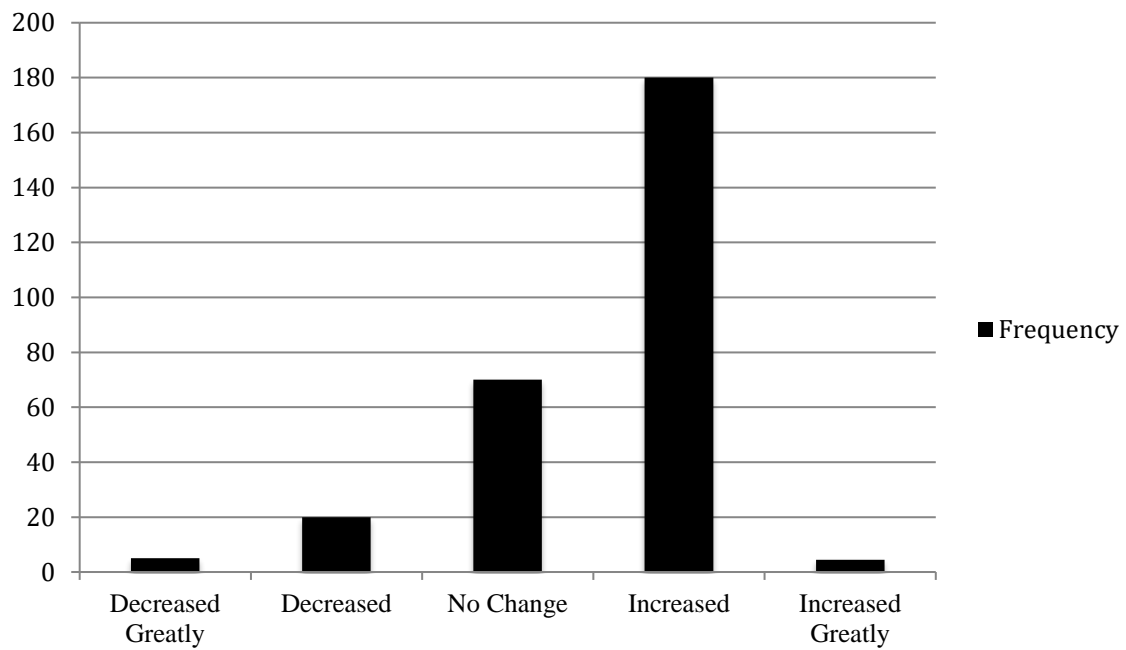
Figure 1.1



Hypothesized Framework

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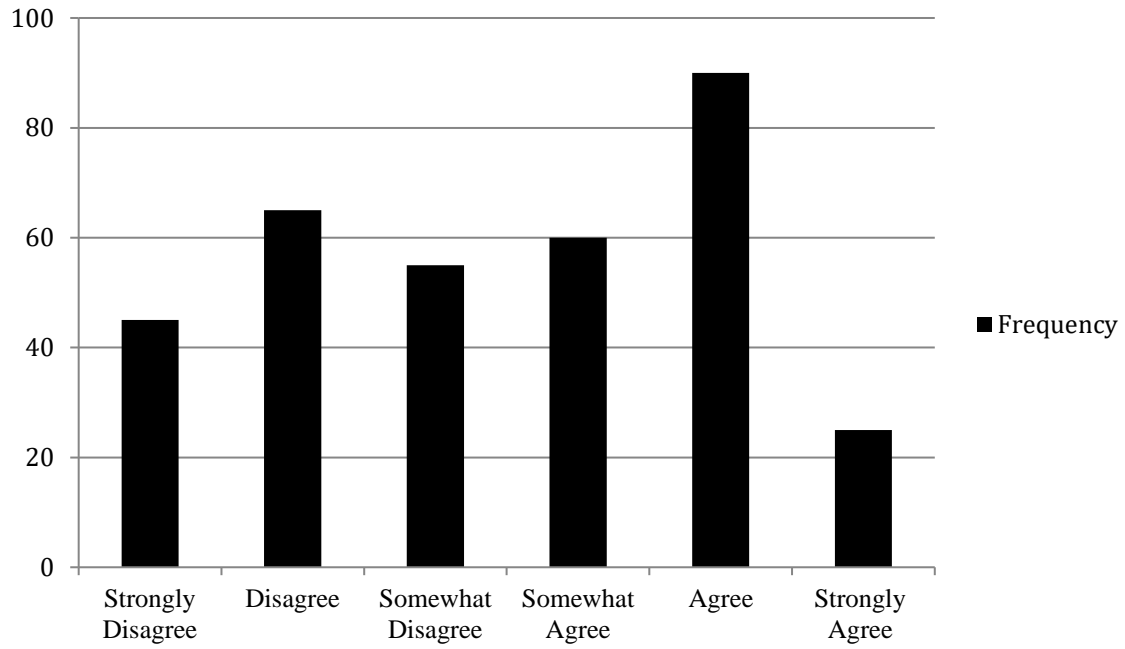
Figure 2.1



Perceived Change in Work Speed Due to Technology Use

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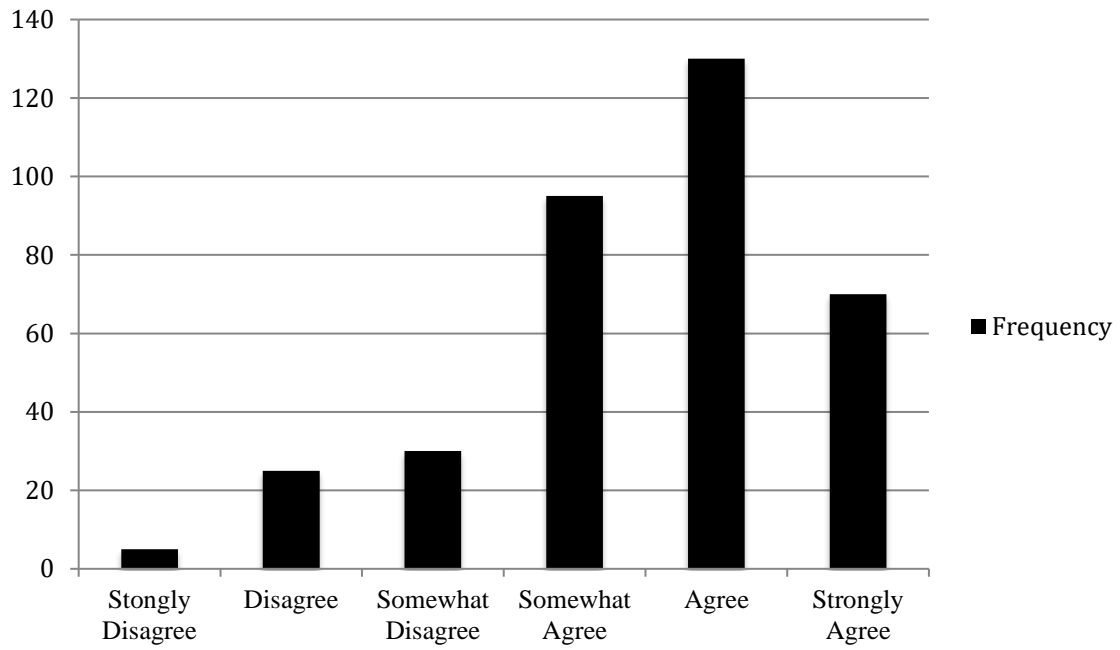
Figure 3.1



Technology Perceived as a Demand

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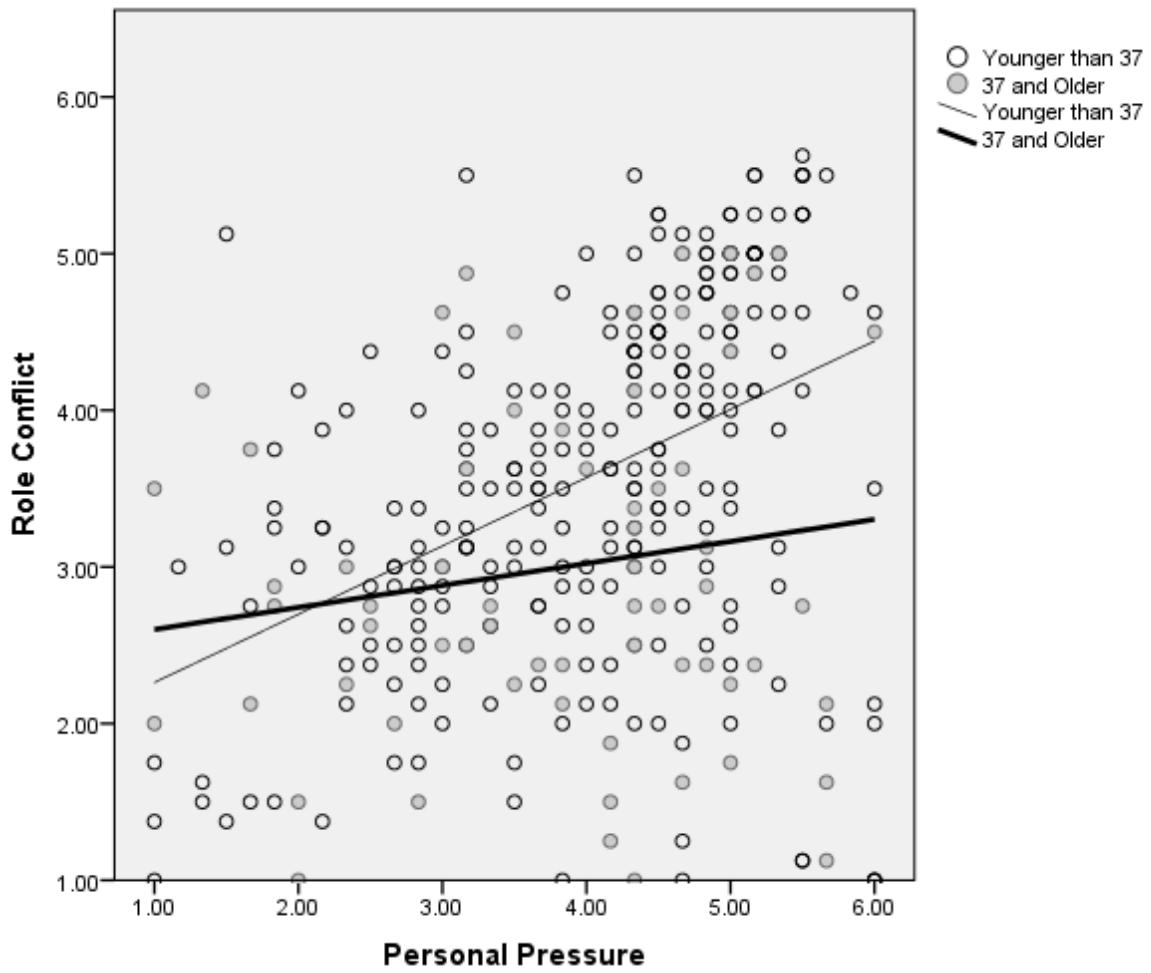
Figure 4.1



Technology Perceived as a Resource

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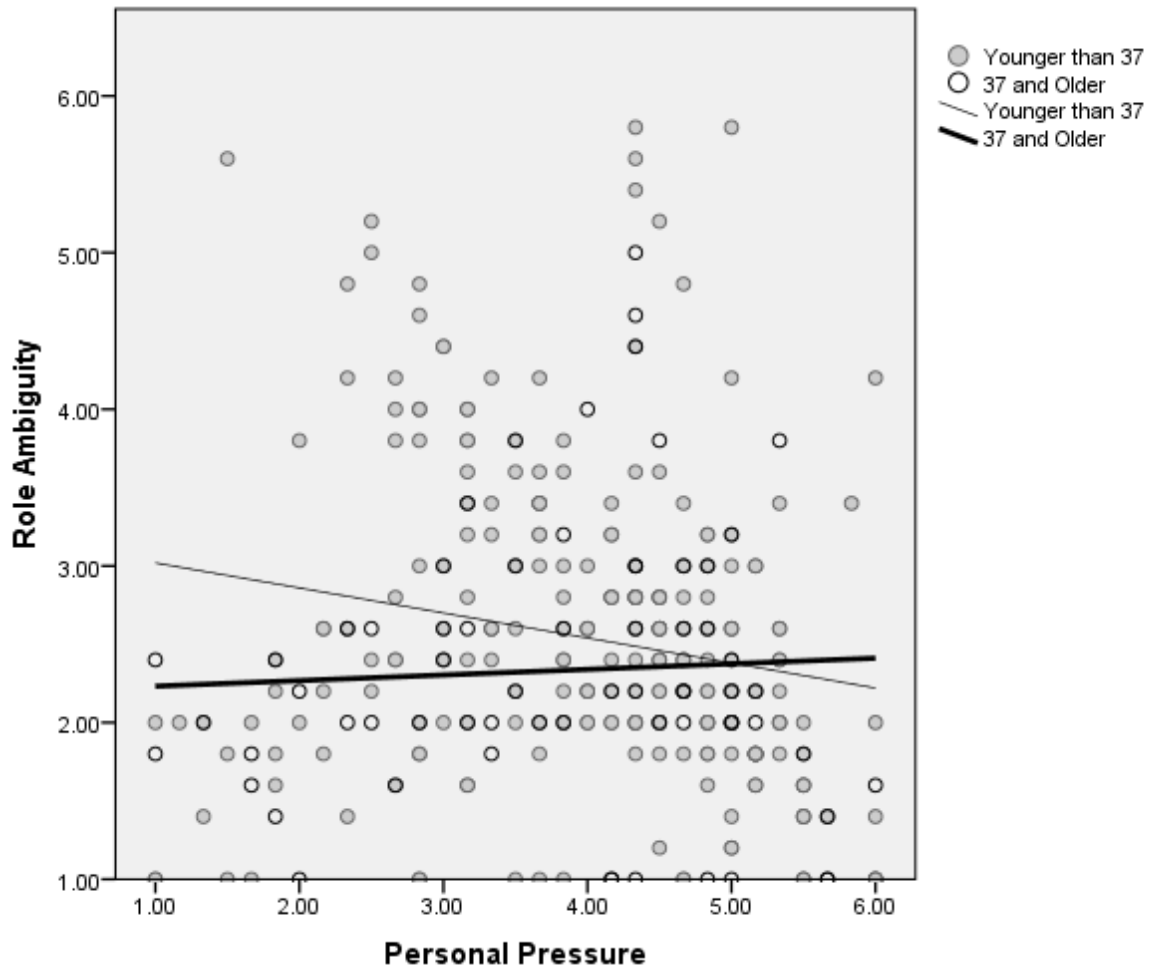
Figure 5.1



Role Conflict Regressed on Perceived Personal Pressure to Use Communication Technology as a Function of Age

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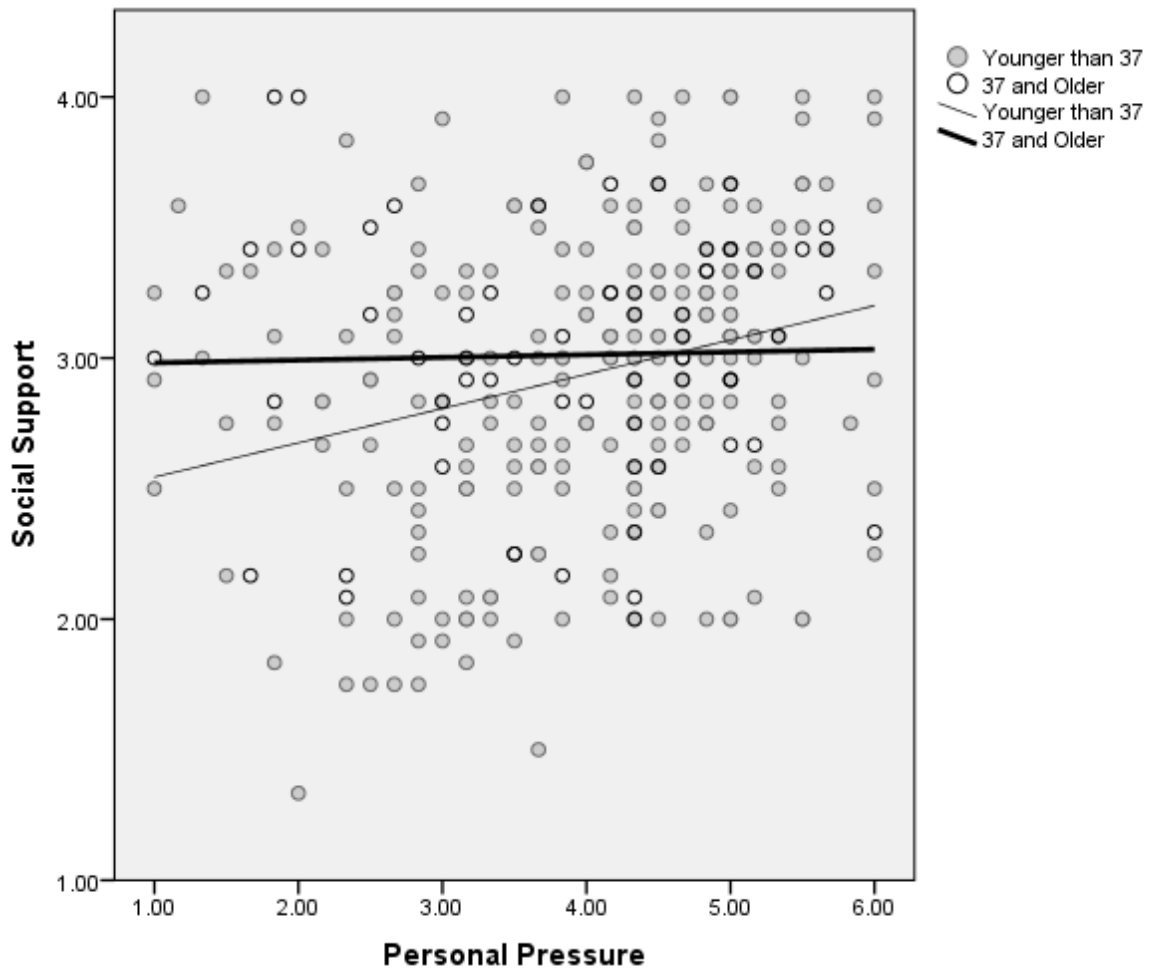
Figure 6.1



Role Ambiguity Regressed on Perceived Personal Pressure to Use Communication Technology as a Function of Age

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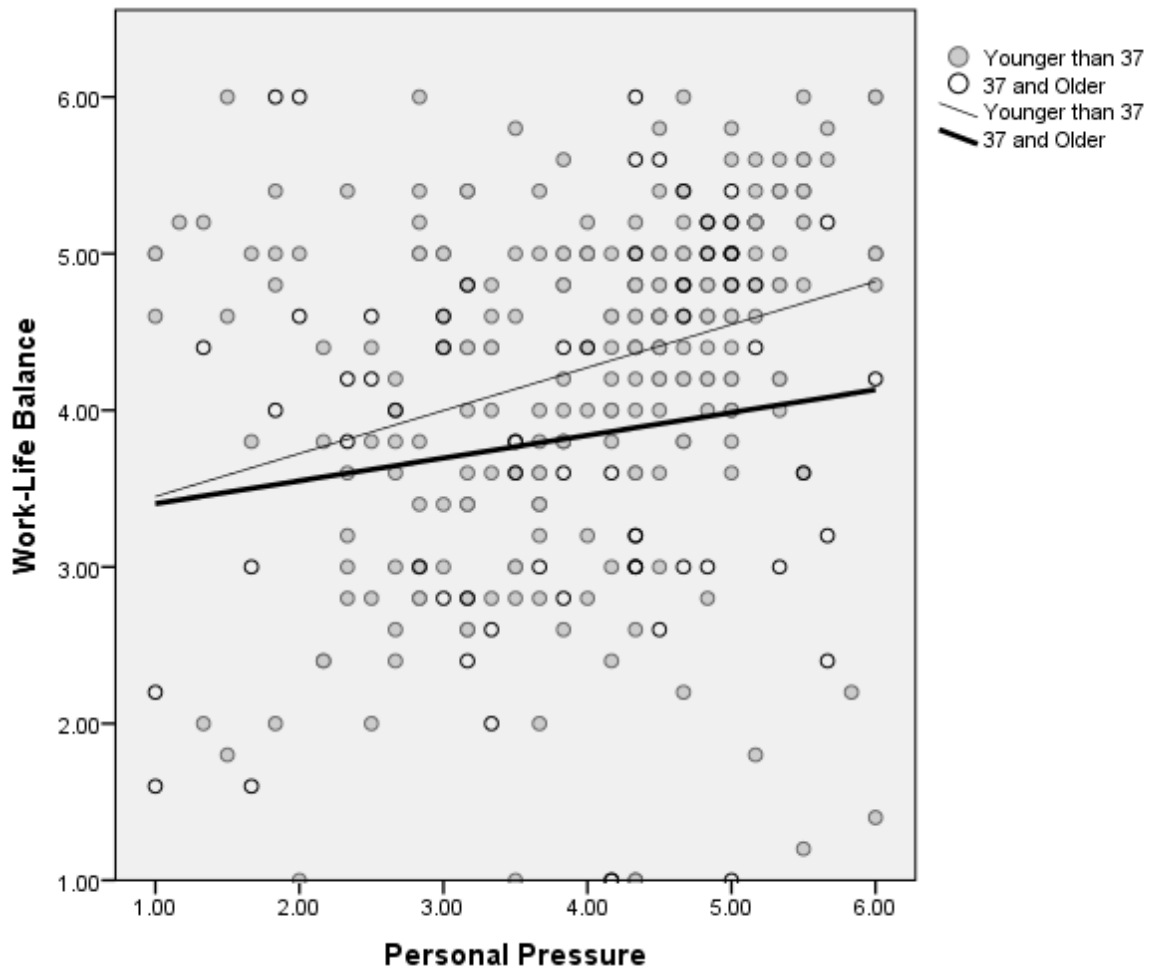
Figure 7.1



Social Support Regressed on Perceived Personal Pressure to Use Communication Technology as a Function of Age

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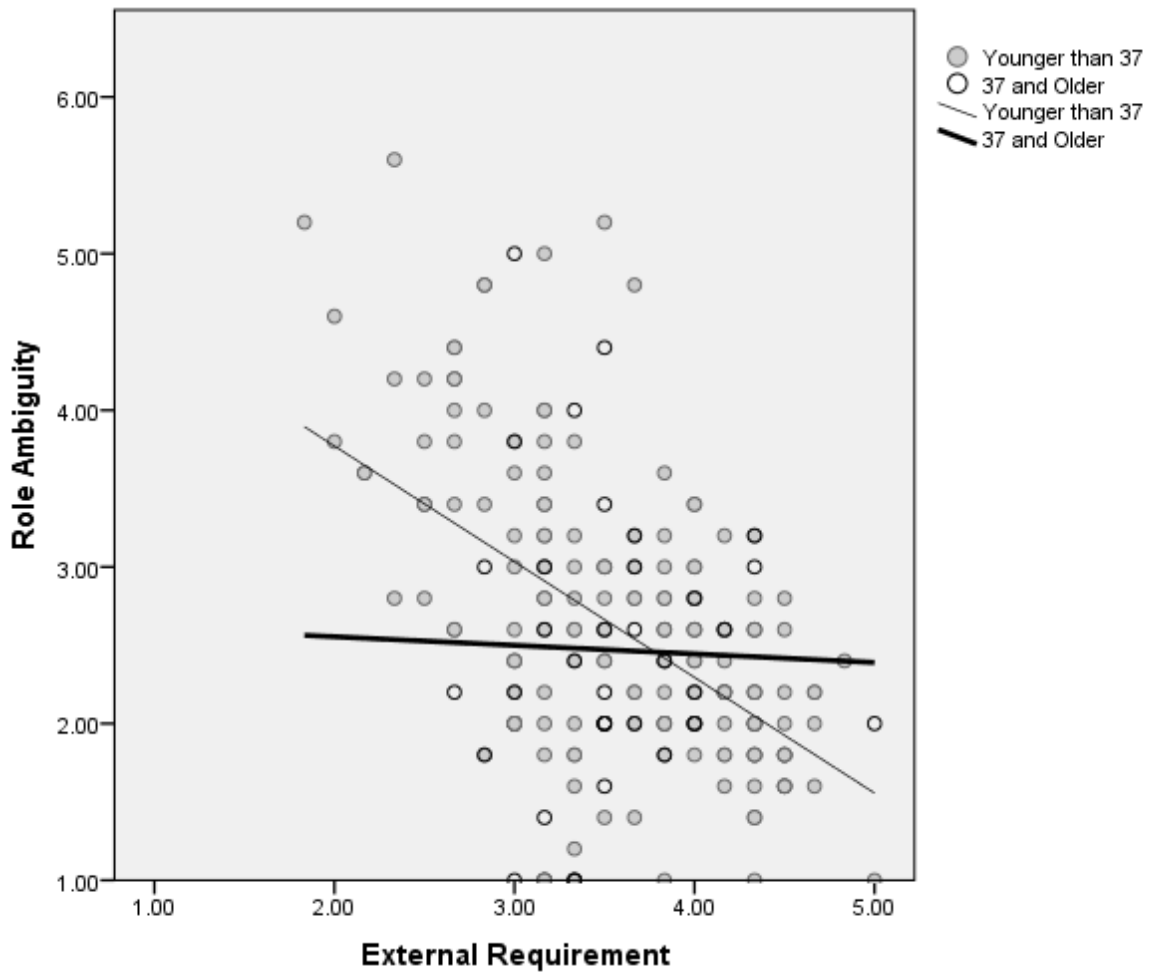
Figure 8.1



Work-Life Balance Regressed on Perceived Personal Pressure to Use Communication Technology as a Function of Age

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Figure 9.1



Role Ambiguity Regressed on External Requirements to Use Communication Technology as a Function of Age

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Appendix A

Demographics

Please indicate your gender. (please circle one)

Female

Male

Prefer not to answer

How many hours do you work on average? (please circle one)

1-34 hours

35-40 hours

41-50 hours

51 hours or more

How long have you been working at your current company? (please circle one)

Less than 1 years

1-3 years

4-7 years

7-10 years

10 years or longer

What is your education level? (please circle one)

High school diploma

Associates degree

Some college

College diploma

Masters or doctorate

N/A

Would you currently identify as (please circle one)

Worker

Manager

Would you currently identify as (please circle one)

Professional

Technical and Trade

Sale and Service

Would you currently identify as (please circle one)

Union

Non-union

Please indicate your age below

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What generational membership do you identify with?

Generational Y After 2000	Millennial 1981-2000	Generational X 1961-1980	Baby Boomers 1941-1960	Other
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Appendix B

External Requirements of Communication Technology Scale

Please answer the following questions regarding your use of technology for work purposes.

For what portion of your day do you use a computer for work, on average? (please circle one)

All of your day	Most of your day	Half of your day	Some of your day	None of your day	N/A
1	2	3	4	5	

For what portion of your day do you use a smart phone for work, on average? (please circle one)

All of your day	Most of your day	Half of your day	Some of your day	None of your day	N/A
1	2	3	4	5	

How does your use of technology currently differ than that three years ago?

Emails

Increased greatly	Increased	Not increased or decreased	Decreased	Decreased greatly	N/A
1	2	3	4	5	

Texts

Increased greatly	Increased	Not increased or decreased	Decreased	Decreased greatly	N/A
1	2	3	4	5	

Cell Phone

Increased greatly	Increased	Not increased or decreased	Decreased	Decreased greatly	N/A
1	2	3	4	5	

Office Phone

Increased greatly	Increased	Not increased or decreased	Decreased	Decreased greatly	N/A
1	2	3	4	5	

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Other (please specify below)

Increased greatly	Increased	Not increased or decreased	Decreased	Decreased greatly	N/A
1	2	3	4	5	

Others:

How has communication technology affected your work speed? (please circle one)

Increased greatly	Increased	Not increased or decreased	Decreased	Decreased greatly	N/A
1	2	3	4	5	

How does your company conduct relations with other companies? (please select all that apply)

- Meetings are conducted face-to-face
- Meetings are conducted by phone
- Meetings are conducted by video conference
- Information delivered by mail
- Information delivered by fax
- Information delivered by email

How does your company conduct relations with customers? (please select all that apply)

- Meetings are conducted face-to-face
- Meetings are conducted by phone
- Meetings are conducted by video conference
- Information delivered by mail
- Information delivered by fax
- Information delivered by email

How does your company conduct relations with employees? (please select all that apply)

- Meetings are conducted face-to-face
- Meetings are conducted by phone
- Meetings are conducted by video conference
- Information delivered by mail
- Information delivered by fax
- Information delivered by email

USE OF COMMUNICATION TECHNOLOGY AND WORK STRESS

In what way do you use technology at work? (please select all appropriate responses)

- To share process information about regular work
- To share information about meetings
- To share information about official presentations
- To record project results and share information about projects
- To share HR-related information including individual profiles

USE OF COMMUNICATION TECHNOLOGY AND WORK STRESS

Appendix C

Personal Pressure of Communication Technology Scale

Please indicate to what extent you agree or disagree with the statements below.

I would feel uncomfortable at work without constant access to information through my work computer.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I would feel uncomfortable at work without constant access to information through my smartphone.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I would be annoyed if I could not look information up on my smartphone when I wanted to do so.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

Being unable to get information on my smartphone would make me nervous.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I would be annoyed if I could not use my smartphone and/or its capabilities when I wanted to do so.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

If I did not have a data signal or could not connect to Wi-Fi, then I would constantly check to see if I had a signal or could find a Wi-Fi network.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

USE OF COMMUNICATION TECHNOLOGY AND WORK STRESS

Appendix D

Work-Life Balance Culture Scale

Please indicate to what extent you agree or disagree with the following sentences.

Our company values measures to promote employee work-life balance.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

Our company supports employees in balancing their professional and private lives.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

Our company's management sets a good example of work-life balance.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

Our company's management is trained to promote the work-life balance of employee.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

At our company, employees are informed about programs promoting work-life balance.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

USE OF COMMUNICATION TECHNOLOGY AND WORK STRESS

Appendix E

Social Support Scale

Please indicate to what extent you agree or disagree with the following sentences.

How much does each of these people go out of their way to do things to make your work life easier for you?

Your immediate supervisor

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

Other people at work

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

Your partner, friends and relatives

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

How easy is it to talk with each of the following people?

Your immediate supervisor

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

Other people at work

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

Your partner, friends and relatives

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

USE OF COMMUNICATION TECHNOLOGY AND WORK STRESS

How much can each of these people be relied on when things get tough at work?

Your immediate supervisor

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

Other people at work

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

Your partner, friends and relatives

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

How much is each of the following people willing to listen to your personal problems?

Your immediate supervisor

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

Other people at work

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

Your partner, friends and relatives

Very Much	Somewhat	A Little	Not at all	N/A
4	3	2	1	

USE OF COMMUNICATION TECHNOLOGY AND WORK STRESS

Appendix F

Role Conflict Scale

Please indicate to what extent you agree or disagree with the following sentences.

I have to do things that should be done differently.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I have to buck a rule of a policy in order to carry out an assignment.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I receive incompatible requests from two or more people.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I do things that are apt to be accepted by one person and not accepted by others.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I work on unnecessary things.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I work with two or more groups who operate quite differently.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I receive assignment without the manpower to complete them.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I receive assignment without adequate resources and material to execute them.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

USE OF COMMUNICATION TECHNOLOGY AND WORK STRESS

Appendix G

Role Ambiguity Scale

Please indicate to what extent you agree or disagree with the following sentences.

I know exactly what is expected of me.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I know that I have divided my time properly.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

Explanation is clear of what has to be done.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

I feel certain about how much authority I have.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

Clear, planned goals and objectives exist for my job.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

USE OF COMMUNICATION TECHNOLOGY AND WORK STRESS

Appendix H

The Positive and Negative Affect Scale

Indicate to what extent you have felt this way during the past year. Use the following scale to record your answer.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

_____ interested	_____ irritable
_____ distressed	_____ alert
_____ excited	_____ ashamed
_____ upset	_____ inspired
_____ strong	_____ nervous
_____ guilty	_____ determined
_____ scared	_____ attentive
_____ hostile	_____ jittery
_____ enthusiastic	_____ active
_____ proud	_____ afraid

USE OF COMMUNICATION TECHNOLOGY AND WORK STRESS

Appendix I

Job Demand – Resource Scale

Please indicate to what extent you agree or disagree with the statements below.

The demands of technology (like cell phones and computers) placed upon me interferes with my well-being.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	

The resources afforded to me by technology (like cell phones and computers) improves my well-being

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	N/A
1	2	3	4	5	6	