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An empirical investigation of technology usage, virtual status, organizational justice, need for affiliation, organizational identification and their influence on work success

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ORGANIZATIONAL IDENTIFICATION

AND THEIR INFLUENCE ON

WORK SUCCESS

by

Julia Crider Graham, B. S., M.S., M.B.A.

A Dissertation Presented in Partial Fulfillment
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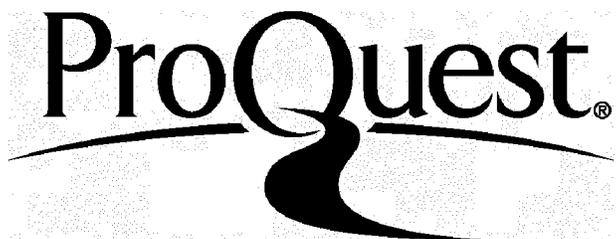COLLEGE OF BUSINESS
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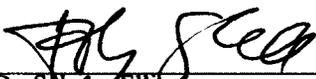
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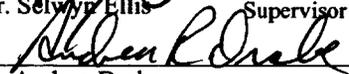
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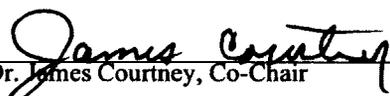
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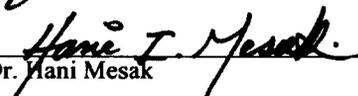
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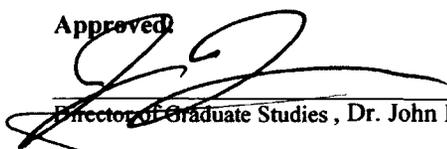
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ABSTRACT

Advancements in information communication technology have led to a growth in the telecommuting work force and increased interest in telecommuting research. Antecedents of work success are re-examined. This study attempts to disclose the relationships among communication technology usage, need for affiliation, organizational justice, employee's virtual status and organizational identification and how these factors affect work success.

Four main questions drove this research: "Do organizational justice and employee's virtual status moderate the relationship between communication technology usage and organizational identification?" ; Do organizational justice and employee's virtual status moderate the relationship between need for affiliation and organizational identification?"; Do organizational identification, organizational justice, and employee's virtual status help explain employee's work success?"; and "How does the communication technology usage portfolio of telecommuters differ from that of their non-telecommuting counterparts?"

Cross-sectional data were collected using an online survey. A total of 263 full-time employees affiliated with a variety of industries in the US provided responses to the questions included in the survey. Upon developing testable hypotheses, the results of employing hierarchical regression analysis reveal that (1) both communication technology usage and need for affiliation positively influence organizational

identification; (2) employee's virtual status moderates the two relationships between communication technology usage as well as need for affiliation and organizational identification; (3) organizational justice positively moderates the relationship between communication technology usage and organizational identification; and (4) both organizational identification and organizational justice positively influence work success.

Applying multivariate statistical methods to the usage data of 22 communication technology devices led to the classification of the devices into four groups: office technology; mobile technology; new technology; and older technology. A comparison of usage between telecommuters and non-telecommuters reveal, among others, that (1) telecommuters use office technologies significantly less frequently than non-telecommuters; (2) telecommuters use mobile technologies significantly more frequently than non-telecommuters; and (3) telecommuters do not use new or older technologies any different from their non-telecommuting counterparts. Interpretation of research findings, contributions of the study to information systems theory and practice, its limitations, and directions for future research are highlighted.

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Date _____4/22/15_____

DEDICATION

This dissertation effort is dedicated to my family and friends without whom I would have never completed this degree.

For my whole world: Bart, Jack, and West.

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ACKNOWLEDGMENTS

To my number one fan, my sweet Bart, you have been more patient than anyone could have asked for during these long seven years. I love you more than you think you know and thank you for all your support, encouragement and love. To my two precious boys, Jack and West, thank you for all your patience while Mommy has had to work. I owe you both many trips to the park! Jack, you are so understanding and full of helpful wisdom such as, "Just be nice and they'll say yes" which truly has kept me going. Westie, you have the most loving heart. Your laugh and smile brightened even my most difficult days and keeps me energized. To my parents, thank you for raising me to believe in myself and instilling in me a lifelong love of learning. I hope I can pass these traits on to my own children. Thank you also for supporting me through my program and all the babysitting hours.

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CHAPTER ONE

INTRODUCTION

The world is seeing unprecedented advancements in technology every day (Brown, et al., 2011). The technological capabilities we have seen and will see in our lifetime are mindboggling. We carry around more computing power in our pockets than was available to launch the Apollo astronauts to the moon (Brown, et al., 2011). Employees are able to use these technologies to conduct their work in new ways and in new locations (Baker, et al., 2006).

During the 1980s, the advent of personal computing allowed for more types of employees to begin working from alternative work locations (DeSanctis, 1984). The emergence of the modern Internet during the 1990s allowed for even more employees to choose remote working locations (Gajendran and Harrison, 2007). In today's world, employees have access to smart phones, tablet computing, 4G wireless devices, and other mobile technology, all of which create a virtual working environment wherever the employee happens to be (Hemp, 2009). This increase in types of technology and workers' dependence upon technology is a main focus of this research study.

In 1995, less than half of firms used telework policies for their employees, and only a very small percentage of IS work in general was being done remotely (Ruppel and Harrington, 1995). Today, wireless freedom has allowed employees to work remotely more than ever before (http://www.teleworkresearchnetwork.com/telecommuting

statistics). In fact, according to the Telework Research Network, the number of employees who telecommute more than one day a week has increased 73% over the last few years (http://www.teleworkresearchnetwork.com/telecommuting-statistics). In 2007, the world witnessed the birth of the smartphone (Brown, et al., 2011). In the few short years since, the world has seen an explosion in mobile computing technology (Brown, et al., 2011). Anyone can have access to the Internet or computing technology from just about anywhere, allowing an employee to work from any location he or she chooses. This new increase in teleworkers has also renewed the interest in research on the subject (Gajendran and Harrison, 2007; McCloskey, 2010 Turetken, et al., 2011; Thatcher and Bagger, 2011).

One of the biggest problems impacting work success is the isolation that the telecommuting employees face (Cooper and Kurland, 2002). Managers lose control of the employees when they are physically out of sight (DeSanctis, 1984) and employees lose a connection (both physical and emotional) to their employer when they no longer work in a traditional office setting (Cooper and Kurland, 2002). By being physically removed from their organization, employees can feel disenfranchised. While previous studies (meta-analysis: Gajendran and Harrison, 2007) have looked at some of the antecedents to work success, a few antecedents have been neglected that should now receive new interest. The first of these is organizational justice (how fair the employee is treated from the organization) which should both directly and indirectly affect work success. Secondly, organizational identification (the degree of an employee's personality that comes from being connected with the organization) will also directly affect work success. Lastly, need for affiliation (the desire to connect with others associated with the

organization) will directly impact organizational identification and therefore indirectly be related to work success.

The main reason these factors should be looked at now is the advancements in computing technologies. Modern computing and network capabilities have added for increased connectivity both in types of medium as well as the richness of the media. By having access to these types of technologies, employees should have a stronger connection to their employer than ever before and vice versa. Just to name a few, both employees and their organizations can video conference, email, text or place a phone call in order to instantaneously stay in touch and make an employee feel less isolated. Due to the strongly dynamic nature of the technology field, research has not fully caught up to the changes seen in technology.

This research looks at communication technology usage, need for affiliation, organizational identification, employee's virtual status and organizational justice as antecedents to work success. In this regard, this study aimed at answering three main research questions.

Research Questions

- Do organizational justice and employee's virtual status moderate the relationship between communication technology usage and organizational identification?

- Do organizational justice and employee's virtual status moderate the relationship between need for affiliation and organizational identification?

- Do organizational identification, organizational justice, and employee's virtual status help explain work success?

After introducing the research model and providing a brief description of its components, the contributions of this research study are highlighted near the end of the chapter.

Research Model

The research model for this dissertation (Figure 1) indicates communication technology usage, need for affiliation and organizational identification as antecedents to employee's work success. The model also uses organizational justice and employee's virtual status as moderators for the two relationships between communication technology usage together with need for affiliation and organizational affiliation. A rationale for the research model is discussed in the next chapter. Figure 1 is a brief introduction and definition to each of the considered constructs.
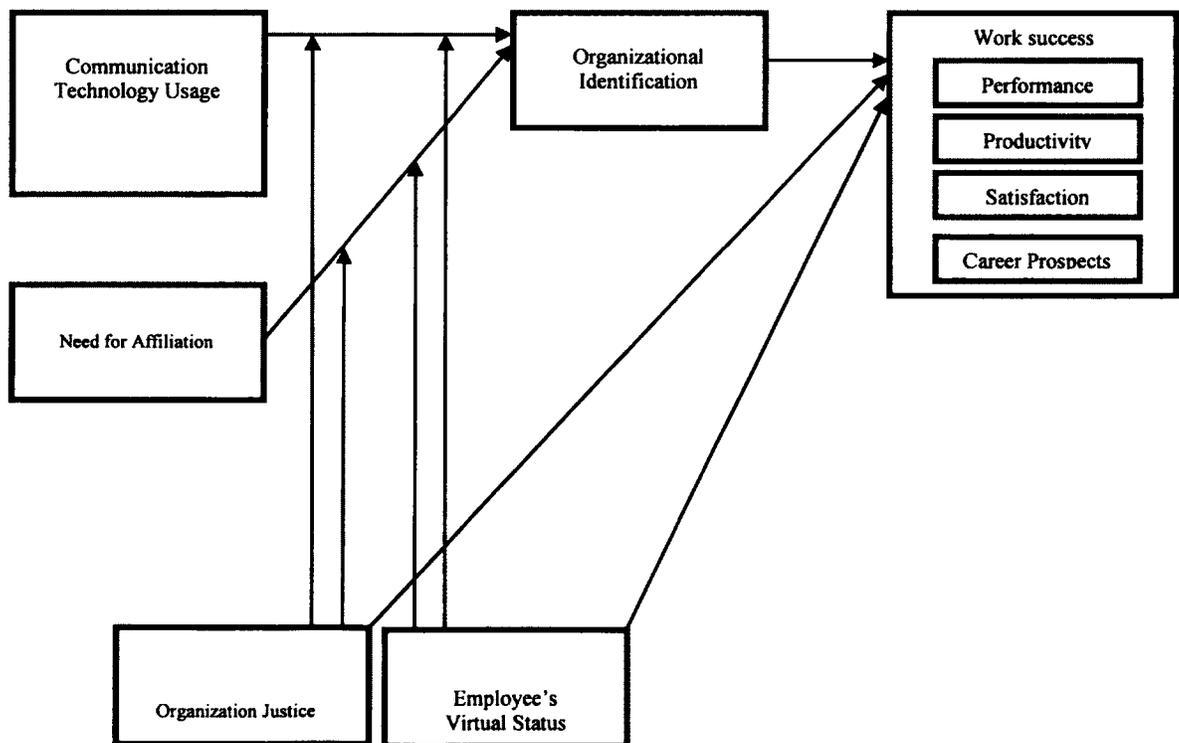
Figure 1 *Research Model*

Telework

The research effort begins with telework (telecommuting or virtual work) which creates the main environment in which this study takes place. In general, telecommuting research is based on self-determination theory, with many studies on telecommuting having their work grounded in this theory (Hunton, 2005). Self-determination theory states that a person should have the right to make his or her own decisions regarding their environment (Deci and Ryan, 2002). This theory is applicable to telecommuting research in that employees may be allowed to choose when and where they would like to complete their work-related tasks. Modern mobile technology allows for work to be conducted anywhere at any time (Hemp, 2009). In 1995, less than half of firms used telework policies for their employees, and only a very small percentage of information systems (IS) work in general was being done remotely (Ruppel and Harrington, 1995). Today, wireless freedom has allowed employees to work remotely more than ever before (http://www.teleworkresearchnetwork.com/telecommuting-statistics). In fact, the number of employees who telecommute more than one day a week has increased 73% over the last few years (http://www.teleworkresearchnetwork.com/telecommuting-statistics). This new increase in teleworkers has also renewed the interest in research on the subject (Gajendran and Harrison, 2007; McCloskey, 2010; Turetken, et al., 2011; Thatcher and Bagger, 2011).

Organizational Identification

The model includes organizational identification (OrgId) as a determinant to work success. Organizational identification is defined as an alignment of one's own values with the values of an organization (Pratt, 1998) or a sense of singleness with an

organization (Ashforth and Mael, 1989). Employees with high OrgId take insults or compliments to their organization personally. High OrgId employees would view work as a family matter and they would derive a sense of their self-worth from belonging to this organization. The organization in question does not have to be a person's employer, but could be an alma mater, social club, family, church, or any other type of group. OrgId is based on social identity theory (Haslam and Knight, 2001; and Van Dick, 2001) which suggests people get some sense of themselves from the social groups to which they belong (Turner and Oakes, 1986).

Communication Technology Usage

Technology is the enabler of telecommuting. Although the information communication technology infrastructure that supports telework might vary, a typical infrastructure includes four categories: devices, databases, telecommunication networks, and software (Tung and Turban, 1996). Common devices include telephone, laptop computer, printer, scanner and fax machine. In robust infrastructures, teleworkers typically use organizational databases accessed via a secured remote connection. Telecommunication networks include, but are not limited to, email, Internet, desktop video teleconferencing, and user interface. To address issues concerning data security, a typical teleworker might receive a laptop that has preloaded antivirus protection and task related software.

Interestingly, an individual's virtual status (i.e., the degree to which the individual operates from the traditional office or from dispersed locations) leads the individual to utilize different communication media. For instance, face-to-face communication is an important medium available to employees working in traditional offices whereas virtual

workers have to rely mostly on email and telephone as the media of necessity (Wiesenfeld, et al., 1999). While face-to-face communication tends to convey social context cues very strongly, email and phone communication are not as rich and therefore they may be less effective as a means of creating and maintaining organizational identification (Sproull and Kiesler, 1986; Wiesenfeld, et al., 1999).

While some jobs are clearly not candidates for telecommuting (e.g., jobs that demand a physical presence, such as food servers or hairdressers) many jobs involve at least some tasks that, barring other constraints, could be performed at locations other than the usual worksite. In other words, jobs are not simply one or the other, but fall along a spectrum from not at all to fully telecommutable, with many jobs falling somewhere between the two extremes. Workers of varying virtual telecommuting status possess, therefore, different communication technology usage portfolios/repertoires the impact of which on organizational identification requires further scrutiny.

Need for Affiliation

Need for affiliation is considered to affect organizational identification. All humans have a desire for a sense of belonging and a need to be in the company of other human beings. The need for affiliation has been defined as an individual's requirement to belong to a social group (McCleland, 1978). In the work place, this could be a need to get along with coworkers or to feel a part of the organization. Employees with high need for affiliation make good team members, but would find telecommuting more difficult due to the lack of companionship from fellow employees (Wiesenfeld, et al., 2001). Employees with a low need for affiliation would tend to work better alone and be better suited for telecommuting. While need for affiliation has been studied in other areas, particularly

management, little to no research has been conducted to study the effect of need for affiliation in information systems research.

Organizational Justice

This dissertation uses organizational justice theory as a moderator in the model. Organizational justice theory is based on equity theory, which suggests that employees seek to keep a fair balance of their rewards versus the rewards of their counterparts (Adams, 1963, 1965). Therefore an employee's perceptions of justice affect his or her individual outcomes, such as job satisfaction (Al-Zu'bi, 2010). The construct of organizational justice is multi-dimensional. The four dimensions of organizational justice are: procedural justice (the fairness of a process leading to an outcome), distributive justice (the fairness of how resources are handed out), informational justice (the adequacy of a decision's explanation) and interpersonal justice (how fairly the employee is treated) (Colquitt, et al., 2001). However, researchers have recently questioned the benefits of focusing exclusively on specific types of justice, suggesting a shift toward examining overall justice judgements (Ambrose and Arnuad, 2005; Ambrose and Schminke, 2009).

Work Success

Lastly, the outcome construct for the model is work success. Work success is the positive realization of a telecommuting policy (Ruppel and Harrington, 1995). Work success is based in self-determination theory, suggesting employees may be allowed to work when and where they like (Hunton, 2005). Measures of work success is comprised of, but not limited to, employee performance, employee productivity and employee satisfaction.

Positioning of Study within Information Systems Research

Figure 1 depicts the proposed relationship between five constructs (communication technology usage; organizational justice; organizational identification; work success; need for affiliation) within a telecommuting framework. Before highlighting the contribution of the dissertation in the next section, it is advantageous to position the current research within relevant information systems research that have considered the five constructs.

Overview of Communication Technology Usage in Information Systems Research

The previous research has not fully explored communication technology usage as a global construct. Some research has been conducted on a single piece of technology, such as email (Higa, et al., 2000). Another paper considered technology as a global construct did find that the use of technology was critical to home-based employees, but the research was more focused on organizational support than the individual types of technologies (Baker, et al., 2006).

A few studies have looked at how employees are using communication technology in terms of media richness. One study has shown that employee's virtual status moderates the relationship between communication technology usage of a handful number of media and organizational identification (Weisenfeld, et al., 1999). Another study, upon using eighteen communication technology media, has shown a positive relationship between communication technology usage and organizational identification (Scott and Timmerman, 1999). This research is somewhat dated due to the lack of

inclusion of new or mobile computing advances (such as smartphones, tablets, cloud computing, social networking, collaborative software, etc.).

While positive relationships have been found between communication technology and work related outcomes (Timmerman and Scott, 2006), conflicting results have been reported suggesting that while employees can feel more connected through communication technology, the overwhelming amount of communications can lead to a decrease in outcomes (Fonner and Roloff, 2012). The findings create a need for further research.

This dissertation examines the impact of a much more current communication technology portfolio dealing with the usage of more than twenty devices on both organizational identification and work success. Furthermore, organizational justice and employee's virtual status are envisioned to moderate the relationship between communication technology usage and organizational identification.

Overview of Organizational Justice in
Information Systems Research

While organizational justice theory has been used in IS research, very little work has been done investigating organizational justice theory in alternative work environments. Previous IS research using organizational justice theory has been primarily focused on the usage of the Internet medium. These studies look at how the use of the Internet has affected users, such as Internet job applications (Dineen, et al., 2004), Internet user privacy (Culnan and Armstrong, 1999; Malhotra, et al., 2004; Posey, et al., 2011), online trust (Benbasat, et al., 2008) and online shopping (Chiu, et al., 2009).

There are two relevant studies in the area of telecommuting, organizational justice, and employees' unfairness perceptions. One study, Kurland and Egan (1999), was undertaken to look at the issues concerning the removal of an employee from the physical supervision of a manager as well as the isolation that employee feels when he or she is telecommuting. The authors found telecommuting to be related to procedural justice perceptions and interactional justice perceptions (Kurland and Egan, 1999).

A second study was recently conducted, examining unfairness perceptions of telecommuters against traditional office workers (Thatcher and Bagger, 2011). This study found that traditional office workers found it unfair that some employees were allowed to work remotely. However, the results of this study showed that teleworkers found it unfair to be remote and isolated from their coworkers and managers (Thatcher and Bagger, 2011).

This dissertation extends further research by examining the moderating role organizational justice has on the relationships between communication technology usage together with need for affiliation and organizational identification. The dissertation also investigates the impact of organizational justice on work success.

Overview of Organizational Identification in
Information Systems Research

Organizational identification is a complex construct that is gaining interest in the Information Systems literature. When brought up in Information Systems literature, most research looks at the concept of identity rather than organizational identification. In other words, most information systems research seems to be focused on who is using the technology such as identity theft (Garfinkel, 1995), identity schema/infrastructures (Li, et

al., 2012), privacy concerns (Zuboff, 1988) and authentication (Davis and Hufnagel, 2007).

The research being conducted using specifically *organizational* identification is more limited. However, some research has found a connection between the introduction of new information systems and organizational identification (Lamb and Davidson, 2005; Gal, et al., 2008; Walsham, 1998; Barrett and Walsham, 1999). Additionally, a few articles have been published looking at the relationship between technology and organizational identity, specifically how an organization can better increase its communication with its employees through the adaptation of new technologies (Doolin, 2002, 2003). Moreover, organizational identification has been found to be directly related to need for affiliation of teleworkers (Weisenfeld, et al., 2001).

This dissertation views organizational identification as essentially a mediating construct between communication technology usage together with need for affiliation and work success.

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Overview of Work Success Factors in Information
Systems Research

</div>

The theoretical background for telecommuting success is rooted in media richness theory (Turetken, et al., 2011) and task-technology fit (TTF) theory (Furneaux, 2012). Media richness theory (MRT) deals with the depth of a medium used to convey information (Daft and Lengel, 1986). Task-technology fit theory asserts that for a piece of technology to have positive effects on employee performance, that technology must be both utilized and suitable to its supported task (Goodhue and Thompson, 1995).

Work success, specifically in the realm of telecommuting success, has been studied as scattered personal outcomes in previous research (e.g., Turketken, et al, 2011; Harrington and Ruppel, 1999). These studies have found a variety of antecedent variables that can impact work success with virtual workers. These antecedents include media richness, employee work experience, task interdependence (Turketken, et al., 2011), trust and work values (Hartington and Ruppel, 1999).

This dissertation views work success as an aggregate construct, integrating a variety of personal outcomes considered in the literature in fragmentation.

Overview of Need for Affiliation in Information Systems Research

Need for affiliation has not been studied extensively within the Information Systems research area. Most of the research that is involved with need for affiliation in this research stream commonly uses computer based employees or information technology professionals as the research participants (Lee, 2008; Martinsons and Davison, 2007).

One article does deal with virtual workers and need for affiliation (Weisenfeld, et al., 2001). This article found that a relationship existed between need for affiliation, organizational identification and organizational support for telecommuters. The findings indicated that employee's need for affiliation could be mitigated by higher organizational support (Weisenfeld, et al., 2001).

This dissertation relates need for affiliation to organizational identification, but in addition it investigates the roles of organizational justice and employee's virtual status as

moderators for the relationship. Furthermore, the participants from whom data are collected belong to a variety of professions and industries.

Contributions of Research Study

This dissertation furthers the Information Systems (IS) literature by extending the knowledge base of technology in the workplace. This will be done in at least two ways. First, a scale for communication technology usage will be developed. Previous scales have not included an up to date list of available technologies (Scott and Timmerman, 1999). Second, organizational justice and employee's telecommuting status will be used as moderators for the relationships between communication technology usage together with need for affiliation and organizational identification.

While organizational justice theory has been used in IS research, very little work has been done investigating organizational justice theory in alternative work environments. Previous IS research using organizational justice theory has been primarily focused on the usage of the Internet medium. These studies look at how the use of the Internet has affected users, such as Internet job applications (Dineen, et al., 2004), Internet user privacy (Culnan and Armstrong, 1999; Malhotra, et al., 2004; Posey, et al., 2011), online trust (Benbasat, et al., 2008) and online shopping (Chiu, et al., 2009). This dissertation extends further research by studying the effects of organizational justice and employee's virtual work status on organizational identification and worker's work success.

Furthermore, this paper brings the construct of organizational identification (OrgId) into the IS research area. Little research has been conducted using OrgId in IS

research and by including this construct, this study attempts to examine OrgId effect on work success.

Practitioners can benefit from this research study as well. Most of today's employees like the idea of working from a non-traditional office space (Yap and Tng, 1990). Firms with or considering telework policies can use results from this study to make better decisions for both their teleworking and traditional employees and managers to ensure a more harmonious work environment. Managers would also be able to better understand which technologies employees are using and how these technologies impact their employees. By incorporating organizational justice theory into telecommuting research, managers can prevent some problems from occurring in the workplace. Joshi (1989, p. 355) tells us that:

> The equity and social psychology literature suggests that inequity is likely to influence attitudes and behavior. Therefore, consideration of equity perceptions in the MIS context could provide additional relevant information to the researchers of user attitudes and behavior. Measurement and analysis of equity issues could potentially lead to better models of user attitudes and behavior.

Employers seem to be recognizing the need for adding telecommuting policies to their benefits packages, as recent surveys have found (http://www.rhi.com). This study empirically examines whether teleworking policies are beneficial to employees as well as employers.

Additionally, employers will have a better understanding of how their employees use communication technologies through answering the following question: How does the communication technology usage portfolio of telecommuters differ from that of their non-telecommuting counterparts? Investments in information technology (IT) is a multi-billion dollar expense for businesses each year with companies spending around 40% of

their budgets on IT (Brown, et al., 2011). By knowing upon which technologies employees are most reliant, companies can better invest their capital.

Overview

The remaining research effort is divided in the following manner. Chapter Two presents the literature and the research hypotheses. Chapter Three reports the research methods to be used to test the hypotheses, survey instruments and construct descriptions that are used in this research study. Chapter Four will contain the data analysis and results. Chapter Five concludes the study, highlights the research limitations and offers suggestions for future research in this research stream.

CHAPTER TWO

LITERATURE REVIEW AND

HYPOTHESES DEVELOPMENT

The objectives of the study are to mainly provide answers to three main research questions. The first research question reads "Do organizational justice and employee's virtual status moderate the relationship between communication technology usage and organizational identification?" The second research question asks "Do organizational justice and employee's virtual status moderate the relationship between need for affiliation and organizational identification?" The third research question inquires "How would organizational identification, organizational justice and employee's virtual status affect work success?" This chapter reviews the relevant literature. Guided by the research model depicted schematically in Chapter One, the present chapter discusses the relationships among the considered constructs. Such discussions lead to a set of testable hypotheses. The next chapter, Chapter Three, highlights the methodology that will be undertaken to assess the validity of the hypotheses introduced herein.

Overview of Telecommuting and Alternative Work Environments

In this dissertation, telework is defined as the ability of employees to work at a location other than a traditional office (Hunton, 2005). For example, an alternative workplace could be a home office, satellite office, or a hotel. In recent years, with the advent of mobile technologies, the list of possible work environments has expanded to

almost anywhere—a car, park, soccer field, coffee shop, airport or any number of places and as such, telecommuting is increasing in a variety of industries (Lapierre, et al., 2008). For the purposes of this dissertation, the terms "telework", "telecommuting" and "virtual work" are used interchangeably.

In addition to the many ways an employee can work virtually, many industries exist in which one may be considered a teleworker. Employees who are self-employed and have a home office are considered by some studies to be telecommuters, as are home-based manufacturers (jewelry, baked goods, candles, art), part-time home business owners (for example, rental property managers, web site developers, make-up consultants), and even farmers (http://www.bls.gov; http://www.census.gov). This varied definition can lead to skewed or unintended results (McCloskey, 2010). For the purposes of this study, the teleworker is considered to be an organizational employee who works from locations including home, using computer technologies, doing a job he or she would traditionally do in an office environment.

Many papers have been written to show the gains and disadvantages of telecommuting for both employees and employers. Research is now moving towards examining the relationships between employers and employees who telecommute (Wellman, et al., 1996). As with many business initiatives, managers and employees might not see eye-to-eye regarding a telecommuting policy. What might be seen as an advantage to one, such as increased autonomy for the employee, would be a disadvantage of less control to the manager. Both employees and managers should receive benefits for the policy to be successful. If both parties do not receive benefits, the relationship between the two can become strained.

Slightly less than three-quarters of employees favor telecommuting, when given a choice of work locales (Yap and Tng, 1990). However, employees favor telecommuting more than managers do (Duxbury, et al., 1987). Employees who are given the option to telecommute have higher job satisfaction compared to those who are only permitted to work in a traditional office environment. In addition, employees perceive an optimal work-home life balance when they are given a choice of work locations (Hunton, 2005). In fact, just announcing a flexible work schedule may improve a firm's financial statement, which shows how enthusiastic workers are to have a telecommuting policy (Arthur and Cook, 2003). Research has also shown that managers never have to meet face-to-face in order to have a successful relationship with their co-workers (Wegge, et al., 2007).

As previously mentioned, both managers and employees can see benefits and drawbacks to a telecommuting policy. In the Table 1, the main advantages and disadvantages of telecommuting policies are listed. This list is compiled from an earlier paper (Ellis and Webster, 1999). Some of these effects are more important in today's economy than in years past, such as savings on gasoline, improved productivity and security risks.

Table 1

Advantages and Disadvantages of Telecommuting

Advantages and Disadvantages of Telecommuting	
Advantages	**Disadvantages**
Employee has a greater sense of control over his job	Increased loneliness of the worker
Fewer interruptions	Increased training time for teleworkers
Savings on food, transportation and clothing	Greater pressure on managers
Improved productivity	Lack of face-to-face contact
Improved employee retention	Security risks of data
Control over office space	Increased hardware and software costs
Reduced need for parking	
Environmental benefits (reduced pollution)	
Increased handicapped workforce	

Note: *Adapted from Ellis and Webster, 1999*

In summary, telecommuting research really began during the 1980s when personal computing and networking technologies allowed for employees to work remotely. However, after over thirty years of research, much of the telecommuting literature is contradictory. Researchers still cannot agree on what the benefits and disadvantages of telecommuting are, and to what extent they affect workers.

Overview of Organizational Identification

As human beings, we have a need for belonging with groups. Organizations give us that, a sense of community. This might come from any number of groups, such as a volunteer group, a church, or in the case of this paper, a company for which an employee works. Organizational Identification (OrgId) is the "perception of oneness with or belongingness to the organization" (Ashforth and Mael, 1989, p. 34). For example, a

person cheering for his alma mater's football team might have high OrgId in that the person feels he or she shares in the school's success.

Research in OrgId first began in 1958 (March and Simon, 1958) but has only recently seen a surge in interest in the last 20 years. Recent contributions to the research have come from the areas of organizational behavior (e.g., Cohen, 1992; Elsbach, 1999; Hall, et al., 1970), psychology (e.g., Abrams, et al., 1998; Barreto and Ellermers, 2000; Bergami and Bagozzi, 2000) and communication (e.g., Barker and Thompkins, 1994; Cheney, 1983; Fontenot and Scott, 2003). Largely, these studies have found OrgId to be strongly correlated to organizational tenure, age and job level as well as attachment to one's occupation and work group (Riketta, 2005). Negatively correlated with OrgId is intention to leave (Riketta, 2005) indicating employees with high OrgId were less likely to leave their firm, while employees with low OrgId were likely to leave.

Organizational Identification research is based on Social Identification Theory (Haslam, 2001 and Van Dick, 2001). This theory suggests that part of a person's sense of self comes from his or her association with a social group (Turner and Oakes, 1986). A person might associate with a particular ethnic or cultural group and derive some portion of their identity from that group (Tajfel, 1974). For example, a Native American might derive his identity from his Native American culture, expressing that by adopting a traditional tribal name or dressing in traditional clothing. Management researchers took this theory and adapted it to business research to suggest that employees would associate themselves with their place of employment (Riketta, 2005).

Several studies have been done investigating the differences, if any, between OrgId and Attitudinal Organizational Commitment (AOC) (e.g., Pratt, 1998; Sass and

Canary, 1991; Van Knippenberg and Van Schie, 2000). AOC is "the relative strength of an individual's identification with and involvement in a particular organization" (Mowday, et al., 1979, p. 226). While the differences between the definitions of AOC and OrgId are subtle, a meta-analytic review of the two constructs found significant differences in what the two items measured (Riketta, 2005).

Overview of Communication Technology Usage

Individuals utilize different communication media when communicating with their organizations. Guided by information richness theory (e.g., Daft and Lengel, 1986), different communication media (e.g., face-to-face and e-mail) possesses characteristics along accessibility/synchronicity, formality, shared interpretive context, and social context cues that would make them more or less effective on organizational identification (Wiesenfeld, et al., 1999).

Previous research has not fully explored communication technology usage as a construct. Some research has been conducted on a single piece of technology, such as email (Higa, et al., 2000), but not technology as its own entity, even within the Information Systems research stream. The only paper found to use technology as a global entity did find that the use of technology was critical to home-based employees, but the research was more focused on organizational support than the individual types of technologies (Baker, et al., 2006). Also, this research is somewhat dated due to the lack of inclusion of new mobile computing advances.

Newer studies have looked at how employees are using communication technology in terms of media richness. Some studies have shown that having a strong organizational support and support from the organization can increase organizational

identification of virtual workers (Wiesenfeldt, et al., 1999) so employees with a strong communication support should also have strong organizational identification leading to higher work success. While positive relationships have been found between communication technology and work related outcomes (Timmerman and Scott, 2006), conflicting results have been reported suggesting that while employees can feel more connected through communication technology, the overwhelming amount of communications can lead to a decrease in outcomes (Fonner and Roloff, 2012).

Employee's Communication Technology Usage Impact on Organizational Identification

Research suggests that the frequency with which individuals communicate with others in the organization leads individuals to feel that they are active participants in the organization (Huff and Kelley, 2003). The act of participation leads individuals to identify themselves with the organization more strongly (Kiesler, 1971; O'Reilly and Caldwell, 1981). Based on the discussion, the following hypothesis is introduced:

H1a: Communication technology usage positively influences organizational identification.

Overview of Need for Affiliation

Need for affiliation was a concept developed by McClelland (1978) as part of a theory of human behavior motivations. McClelland's work was based on the previous research of Murray (1938). Murray proposed the idea in conjunction with a motivational model which included the needs of humans. These needs included affiliation. In other words, humans need to be connected to other humans (at least in some degree) in order to effectively perform jobs.

Specifically, the need for affiliation deals with a person's desire to belong with a certain social group (Wiesenfeld, et. al, 2001). The affiliation between employees can be affected by stress meaning that stressful situations can increase the need for affiliation (Schacter, 1959). Employee's needs for affiliation would vary depending on the time or situation. For example, when receiving bad news, a person might have a higher need for affiliation than a person doing an expense report. Conversely, if a person is in an embarrassing situation, he or she would have a low need for affiliation.

Need for Affiliation Impact on Organizational Identification

The need for affiliation is conceived to be a person's desire for a sense of belonging to a social group. Organizational identification may be strong for individuals with higher need for affiliation because such individuals need and want to belong (Markus and Kitayama, 1991; Veroff and Veroff, 1980). In contrast, individuals with low need for affiliation have less intrinsic need to belong and are likely to view themselves as independent from others (Wiesenfeld et al., 2001). Based on the discussion the following hypothesis is introduced:

H1b: Need for affiliation positively influences organizational identification.

Virtual Status as a Moderator of the Relationships Between Telecommunication Technology Usage as well as Need for Affiliation and Organizational Identification

As mentioned earlier, telework is conceived as the ability of employees to work at locations other than the traditional office. Previous research findings (e.g., Evlend and Bikson, 1988; Huff and Kelley, 2003) indicate that employees' virtual status affect their use of communication media. Wiesenfeld, et al., (1999) found that virtual status

moderates the relationship between communication usage of certain media and organizational identification, giving rise to the following hypothesis:

H2a: Employee's virtual status moderates the relationship between

communication technology usage and organizational identification.

Telecommuters may experience uncertainty and lack of security in their relationship with the organization. Non-telecommuting workers often react to telecommuters with suspicion, questioning the latter's efficiency and credibility, and non-telecommuters are generally aware of these suspicions (Baruch, 2000; Thatcher and Zhu, 2006). It is thus expected that for the same level of need of affiliation, the perceived organizational identification would be lower for an employee with an intensive level of telecommuting than another of a lower level of the same, giving rise to the following hypothesis:

H2b: Employee's virtual status negatively moderates the relationship between

need for affiliation and organizational identification.

Overview of Organizational Justice Theory

Equity theory, developed in 1963 by John Stacey Adams, argues that individuals determine the fairness of outcomes by comparing the fairness of their inputs (for example, knowledge, training and education) to those of their coworkers. If an individual perceives an inequity between these inputs and outcomes, equity theory posits that the individual will seek to restore balance by adjusting inputs, outcomes, or by leaving the organization (Adams, 1963; Adams, 1965).

Most of organizational justice theory research is conducted in the fields of Management and Industrial/Organizational Psychology. In these fields, researchers seek

to understand the basis for employees' actions to various situations. Researchers have also found a cultural difference in these reactions (Adams, 1963) meaning that in the United States, employees might have different inputs and outputs than an employee in another country.

According to some research (e.g., Colquitt, 2001; Greenberg and Colquitt, 2005), the concept of organizational justice can be defined in terms of four distinct dimensions: (1) *distributive justice*, referring to the perceived fairness of the outcomes and the allocation of resources in the market place, (2) *procedural justice*, referring to the perceived fairness of the formal decision making procedures used in the organization, (3) *informational justice*, referring to the adequacy of a decision's explanation, and (4) *interactional justice*, referring to the perceived fairness of the interpersonal treatment received from the supervisor.

However, recent research (e.g., Ambrose and Arnuad, 2005) advocate a shift toward examining overall justice judgements instead. Ambrose and Schminke (2009) mention two main reasons for this interest. First, there is an increasing acknowledgement in the justice literature that the focus on different types of justice may not accurately capture individuals' justice experiences. Second, a focus on overall justice may broaden the questions justice researchers consider and overcome some limitations in current examinations of justice.

Organizational Justice as a Moderator of the Relationships Between Telecommunication Technology Usage as well as Need for Affiliation and Organizational Identification

Justice communicates to individuals that they are respected members within the organization, and that they can be proud of their organization's membership. Through its

link to these feelings of respect and pride, it is anticipated that (a) an individual at the same level of communication technology usage would have a higher level of organizational identification for a higher level of perceived organizational justice, and (b) an individual at the same level of need for affiliation would have a higher level of organizational identification for a higher level of perceived organizational justice (Olkkonen and Lipponen, 2006). The discussions give rise to the following hypotheses:

H3a: Organizational justice positively moderates the relationship between

communication technology usage and organizational identification.

H3b: Organizational justice positively moderates the relationship between need

for affiliation and organizational identification.

Overview of Work Success

As telecommuting has become more popular in the workplace, researchers have begun to look for those factors that make work successful for both the employee and the employer. Previous research has shown that many different factors play into a positive telecommuting practice. Early works show that using outcome based performance measurement (focusing on goals and objectives rather than micromanagement approach) of employees leads to effective telework (DiMartino and Wirth, 1990). Further research suggests that the task-technology fit is essential to work success (Bélanger and Collins, 1998; Kavan and Saunders, 1998). Other factors contributing to work success have been IT infrastructure compatibility with employees, and group values (Harrington and Ruppel, 1999) and trust (Harrington and Ruppel, 1999).

Most recently, researchers have found that employee's attitudes and social interactions are the most important factors leading to work success (Bélanger and Collins,

1998; Neufeld and Fang, 2005). Employees who telecommute would have a strong need to manage the relationships with their managers and colleagues even more so than an employee in a traditional office. Think of a family of which all members live in the same town. They don't have to work as hard to manage their relationships as a family who lives in separate parts of the country. The same is true for an employee who works remotely; he/ she must more diligently manage his/ her work relationships than an in-office employee.

Organizational Identification Impact on Work Success

Measures of work success are composed of, but not limited to, employee performance, employee productivity, employee satisfaction, and employee perceived career prospects. Previous research (Van Dick, 2004; Olkkonen and Lipponen, 2006) indicate that organizational identification is negatively related to turnover intentions and positively related to extra-role behavior toward the organization. In line with previous research findings, the following hypothesis is presented:

H4: Organizational identification positively influences employee work success.

Virtual Status Impact on Work Success

Telecommuting leads to reduced costs of working, via savings in transportation, and (in many cases) formal business dress is not required. By providing the opportunity to telecommute, such an arrangement could also symbolize an employer's willingness to alter the work arrangements, reflecting or allowing a greater fit between themselves and their job, which is an aspect of positive work adjustment (Baltes et al., 1999; Gajendran and Harrison, 2007). These benefits of telecommuting lead to the following assertion:

H5: Employee virtual status positively influences employee work success.

Organizational Justice Impact on Work Success

Perceptions of organizational justice have been linked meta-analytically to a variety of important work outcomes, such as job satisfaction, organizational commitment, and organizational-citizenship behaviors (Cohen-Chorash and Spector, 2001; Colquitt et al., 2001). In this regard, the following hypothesis is introduced:

H6: Organizational justice positively influence employee work success.

The set of hypotheses introduced in this chapter are depicted in a tabular form as shown in Table 2.

Table 2

Hypotheses

Hypotheses	
Hypothesis	Expected Results are either Positive (+) or Negative (-)
H1a: Communication technology usage **positively** influences organization identification.	Positive (+)
H1b: Need for affiliation **positively** influences organizational identification.	Positive (+)
H2a: Employees virtual status moderates the relationship between communication technology usage and organizational identification.	No specific sign(s)
H2b: Employee's virtual status moderates the relationship between need for affiliation and organizational identification.	No specific sign(s)
H3a: Organizational justice **positively** moderates the relationship between communication technology usage and organizational identification.	Positive (+)
H3b: Organizational justice **positively** moderates the relationship between need for affiliation and organizational identification.	Positive (+)
H4: Organizational justice influences **positively** employee work success.	Positive (+)
H5: Employee virtual status **positively** influences employee work success.	Positive (+)
H6: Organizational identification **positively** influences employee work success.	Positive (+)

CHAPTER THREE

RESEARCH METHODS

This Chapter discusses the participants and provides brief descriptions of each of the constructs involved in the research together with the instruments that will be used to operationalize them. The statistical means that will be used in testing the hypotheses depicted in Chapter Two as well as some other closely related matters will be highlighted.

Participants

Data were collected for this research using a questionnaire (Appendix A) which was approved by the University's Human Subjects Committee (Appendix B). In order to keep the sample coherent, all survey participants were full time employees aged 18 and older. The respondents were randomly selected from Qualtric's panel of survey participants, a company that administers online surveys and polls. The respondents were compensated with a cash payment of $2.

The number of respondents was determined using a statistical power approach. In this regard, statistical power $(1 - beta)$ is determined by three elements: level of significance (alpha), sample size n, and effect size index $f^2 = [R^2/ (1 - R^2)]$ for multiple regression (Cohen, 1977). Using alpha = 0.05, and a statistical power of 0.80, Table 4-5 on page 174 in Hair, et al., (2010) implies that for a minimum $R^2 = 0.08$ and a number of

predictors = 20, the required sample size = 250. The small value of 0.08 for R^2 is selected according to a recommendation by Olejnik (1984, p.46) who mentions that "It is better to underestimate the size of the effect than to overestimate it." The final sample size for this study was 263 respondents. This is consistent with a general rule of thumb in Kutner, et al., (2005, p. 346) stating that "there should be at least six to 10 cases for every independent variable in the pool." Post-hoc statistical power calculation for each relevant estimated multiple regression model will be also provided in Chapter Four.

All of the respondents were full time workers from the United States. The responses were divided fairly evenly between men and women with 152 women and 111 men. The average age of the respondents was 43.29 years, and 144 of the respondents were married or in a domestic partnership. Additionally, the average number of dependents at home was 2.16 and the employees had an average tenure of 11.11 years. A breakdown of the demographic data of the respondents is listed in Table 3. Respondents were asked about their industry affiliation and those are listed in Table 4.

Table 3

Demographic Breakdown of Participants

Demographic Variable	Number of Participants
Gender	
Male	111
Female	152
Marital Status	
Married/Domestic Partner	144
Single	119
Age	
18-35	92
36-50	79
51 and above	92
Number of Dependents	
2 or less	170
3-5	83
6 or more	10
Organizational Tenure	
Less than 5 Years	97
5-14 Years	90
15 or more Years	76
Education Level	
High School/GED	63
Tech. School/Associates Degree	67
Bachelor's Degree	83
Master's Degree	42
Doctoral Degree	8
Telecommuting Status	
Telecommuters	123
Traditional Office Workers	140

Table 4

Industries of Participants

Industry	Number of Participants
Accounting/Auditing	7
Administration	21
Advertising/Marketing	1
Analyst	3
Art/Creative/Design	5
Business Development	3
Consulting	4
Construction	9
Customer Service	22
Distribution	1
Doctor	2
Educator (e.g. teacher, lecturer, professor)	25
Engineering	3
Finance	6
General Business	8
Healthcare Provider (other than doctor or nurse)	16
Human Resources	31
Information Technology	3
Legal	21
Management	13
Manufacturing	11
Nurse	4
Production	3
Production Management	1
Project Management	1
Public Relations	2
Purchasing	6
Quality Assurance	1
Research	17
Sales	0
Science	2
Strategy/Planning	3
Supply Chain	1
Training	2
Writing	0

Constructs and Variables

To conduct data analysis, constructs were used as independent, dependent or moderating variables. These constructs are organizational identification, communication technology usage, need for affiliation, work success (composed of items belonging to employee performance, employee productivity, employee satisfaction and perceived career prospects), organizational justice, and employee virtual status. Lastly, the demographic data of organizational tenure, age, marital status, gender, number of dependents and educational level were collected for control purposes. The description of each construct together-with the way used in its operationalization is briefly discussed in the next section.

Organizational Identification

As mentioned earlier, organizational identification is the extent to which one associates oneself with the organization or group (Riketta, 2005). This study uses what is referred to as the Mael's scale to measure Organizational Identification (Mael and Ashforth, 1992). The scale is composed of six items. The Mael's scale was chosen because it is a previously validated measure and was found in a meta-analysis to function better for explanatory and predictive studies (Riketta, 2005). Each item is measured using a Likert scale ranging from "Disagree Completely" (1) to "Agree Completely" (7).

Communication Technology Usage

Communication technology usage represents the frequency with which an employee uses different communication media (e.g., email, phone, etc.) in communicating with organization members (i.e., his/her supervisor, peers and

subordinates). For each medium used for communication, and similar to Wiesenfeld, et al., (1999) each respondent was asked to indicate his/her usage on a Likert scale ranging from "Not at all" (1) to "Daily" (7).

Need for Affiliation

Need for affiliation stands for a person's desire for a sense of belonging to a social group (McClelland, 1978). For the purposes of this study, we looked at a person's need for affiliation in the workplace, in other words, how much an employee seeks to "fit in" with his or her coworkers. In order to measure need for affiliation, the instrument used is composed of 10 items. Four items were included from Baker's (1979) affiliation motivation scale, one item from Jackson's (1984) Personality Research Form (PRF) scale and five items from the Interpersonal Orientation Scale (IOS; Hill, 1987). A somewhat similar instrument has been used and validated by Wiesenfeld et, al., (2001). Each item is measured using a Likert scale ranging from "Disagree Completely" (1) to "Agree Completely" (7).

Employee Work Success

The instrument used to measure work success benefitted from items included in three instruments developed by Neufeld and Fang (2005), Bélanger, et al., (2001), and Turetken, et al., (2011).

The survey instrument is a collection of four components, composed of a total of 14 items. The first component is employee performance or how well the employee conducts his or her job. The second is employee productivity or how much the work the employee can conduct in a given amount of time. The third component is employee

satisfaction meaning how contented the employee is within his or her job. Finally, perceived career prospects is the last component designating the likelihood of being promoted within the current organization. It is presented by a single-item as in McCloskey (2010) ranging from one (slight chance of promotion) to seven (excellent change of promotion).

Organizational Justice

As stated earlier, organizational justice is how an employee views the conduct of his or her employing organization and the employee's attitudes resulting from these actions (Greenberg, 1987). The study measured organizational justice using an overall perception of organizational justice composed of six items (Ambrose and Schminke, 2009). This instrument has been previously validated and used in other studies (e.g., Rupp, 2011 and Johnson and Lord, 2010). Each item is measured using a Likert scale ranging from "Disagree Completely" (1) to "Agree Completely" (7).

Employee Virtual Status

Each respondent was asked how many hours he or she works per week and where these hours are spent. Virtual status was measured as the proportion of the hours per week worked outside the normal office to the total number of hours worked per week. The proportion was found to take on a "U-shaped" like distribution that is very shallow between its two extremes, motivating its presentation by a binary (dummy) variable that takes on a value of zero for telecommuters and a value of one for non-telecommuters (traditional office workers). Employee virtual status was thus operationalized into two categories: a telecommuter who telecommutes 80% of the time or greater and a non-

telecommuter who telecommutes less than 80% of the time. The cutoff point of 80% was selected because the median percentage of hours worked in a traditional office was 84%.

Employees were also asked if they telecommute voluntarily or if their working status was mandated from their employer. Additionally, to gain more background, the respondents were asked whether a formal telecommuting policy exists within their organization. Both of these items were operationalized as dummy variables with zero meaning "yes" and one meaning "no."

Demographics

The demographic data collected for this study included gender, age, marital status, number of dependents, and education level. These items were measured by traditional check-box items on the survey and a dropdown box for number of dependents. Organizational tenure was also considered as a control variable. Organizational tenure is how long an employee has been with the firm (Freeman, 1980) and was measured using a dropdown box, allowing the respondent to select the number of years he or she has worked for the firm.

Gender, education level and marital status were all operationalized as dummy variables with education level being broken into three dummy variables for the different education levels. Gender was coded with zero meaning "male" and one meaning "female". Education level was coded with 0, 0, 0 meaning "high school graduate", 1, 0, 0 meaning "associate's degree/trade school", 0, 1, 0 meaning "college graduate" and 0, 0, one meaning "master's degree or doctorate". Marital status was operationalized with zero meaning "single" and one meaning "married/domestic partnership". Age, number of dependents, and organizational tenure were treated as continuous variables.

Methods of Data Analysis

Data analysis mainly aims at:

(a) performing psychometric analysis of the measured constructs. For that matter, exploratory factor analysis will be used to assess the dimensionality of the scales and reliability analysis is undertaken to check their reliability.

(b) testing the hypotheses depicted in Table 2 (Chapter Two). For that matter, Hierarchical Regression Analysis will be employed.

(c) examining the specification adequacy of main estimated regression models. For that matter, Ramsey's RESET test will be used as a diagnostic tool for model misspecification.

(d) validating the asserted mediating role of organizational identification depicted in Figure 1. For that matter, three multiple regression models will be estimated and their results will be assessed, following the procedure articulated by Baron and Kenny (1986).

(e) studying the relationship between employee's virtual status and employee's usage of 22 considered communication technology devices. For that matter, a battery of statistical methods will be used including multiple regression analysis, Spearman's rank correlation coefficient, and Z- test statistic for examining the difference in usage percentages of each of the considered 22 devices between telecommuters and non-telecommuters.

Detailed description of the statistical methods together with their associated implementation results and discussions are found in the Chapter Four.

CHAPTER FOUR

STATISTICAL ANALYSES

The purpose of this chapter is to shed light on the following: (a) psychometric properties of the measurement scales, (b) hypotheses testing, (c) adequacy of specifications of main estimated regression models, (d) the mediating role of organizational identification, (e) the relationship between virtual status and communication technology usage, and (f) further exploration of the significant interaction effects and the consequences of the entire results of the data analyses.

Psychometric Analysis of Measurement Scales

With the exception of Telecommuting Intensity and the demographic data, responses to items were measured using a 7-item Likert scale. Three items (Organizational Justice item 6, Work Success item 3, and Work Success item 7) in the survey were recoded as they were reverse score items. This was done in order to ensure consistency with other responses (Robert and Dennis, 2005). The instrument was distributed to 12 IT professionals to verify the instrument's appropriateness with their feedback being incorporated into the final instrument included in Appendix A. Given that the survey instrument utilizes previously validated scales, the stated procedure is an acceptable means of determining final overall validity of the instrument (Straub, 1989). Responses to items of different constructs were analyzed using principal component exploratory factor analysis (EFA) with Varimax rotation.

After running the explanatory factor analysis for each scale, items one and three related to the employee work success construct were removed for low reliability. Additionally, items four and six related to the organizational justice scale, together with items one, three, and seven related to the employee work success scale, were removed for the same reason. Lastly, items one and five were removed from the need for affiliation scale due to cross-loading. Once these items were removed, all other items loaded above the traditionally accepted cutoff of .5 (Hair, et al., 2010). Upon completion of the factor analysis, each overall scale value was determined by averaging the individual items (Gefen, 2000) in order to conduct subsequent statistical analyses. Varimax rotation and factor extraction based on Eigenvalues > 1 for each construct was implemented as the criterion for determining the number of factors. All items related to a specific construct loaded on one factor except for the technology usage items which loaded on four separate factors. The Eigenvalues for the communication technology usage construct can be viewed in Table 5 and the traditionally accepted cutoff of .5 can be seen in Table 6. Table 5 shows that each factor accounts for a significant amount of total variance, and they collectively contribute to more than 65% of such variance.

Table 5

Technology Usage Eigenvalues

	Total	% of Variance	Cumulative %
1	8.731	39.684	39.684
2	2.828	12.856	52.540
3	1.569	7.131	59.671
4	1.239	5.634	65.305

Table 6

Results of EFA

Item	Score
Tablet Computer	.595
Cell Phone/Smart Phone	.853
GPS	.643
Text Messaging	.836
Social Networking	.623
Laptop	.592
Instant Messaging	.652
Digital Signatures	.630
VPN (Virtual Private Network)	.701
Teleconferencing (Skype, FaceTime, etc.)	.614
Collaborative Software (i.e. Google Docs)	.745
Cloud Computing	.641
Chat Rooms	.825
Message Boards	.757
Wikis	.681
Virtual Reality	.718
PC	.717
Printer	.835
Fax Machine	.714
Land Line Phone	.799
Internet	.621
Email	.617
Organizational Justice 1	.972
Organizational Justice 2	.965
Organizational Justice 3	.959
Organizational Justice 5	.949
Organizational Identification 1	.797
Organizational Identification 2	.764
Organizational Identification 3	.846
Organizational Identification 4	.869
Organizational Identification 5	.869
Organizational Identification 6	.733
Work Success 2	.780
Work Success 4	.810
Work Success 5	.865
Work Success 6	.895
Work Success 8	.872
Work Success 9	.896
Work Success 10	.870

Table 6 (Continued)

Work Success 11	.818
Work Success 12	.818
Work Success 13	.821
Work Success 14	.795
Need for Affiliation 2	.693
Need for Affiliation 3	.775
Need for Affiliation 4	.769
Need for Affiliation 5	.687
Need for Affiliation 6	.794
Need for Affiliation 8	.709
Need for Affiliation 9	.681
Need for Affiliation 10	.733

Next, the reliability of each measure was examined. In academic research, reliability looks to see if the measure yields the same results in different studies (Straub, 1989; Cronbach, 1951). Cronbach alphas were calculated for the scales. As shown in Table 7, all of the Cronbach alphas were greater than .70, which is the traditionally accepted cutoff (Nunnally, 1978) indicating that the measures are reliable.

Table 7

Cronbach Alphas to Assess Reliability

Scale	Cronbach Alpha
Mobile Technology Usage	.841
New Technology Usage	.870
Older Technology Usage	.890
Office Technology Usage	.835
Organizational Justice	.973
Organizational Identification	.897
Work Success	.955
Need for Affiliation	.868

Hypothesis Testing

Table 8 introduces the terms and abbreviations shown in this study. In this dissertation, hypotheses are tested using hierarchical multiple regression analysis (see Tables 9 and 10). Multicollinearity is examined using the variance inflation factor (VIF) statistic. Following Aiken and West (1991), all continuous variables are centered around their means prior to including them in the regression models. Centering eases the interpretation of the non-product terms and reduces multicollinearity between each interaction term and its component multiplier without affecting the coefficient of the interaction itself (Aiken and West, 1991, Chapter Three). The approach of data analysis reported herein is similar to those undertaken by Ray, et al., (2005) and Jones and Volpe (2011). Before presenting the results, it would be advantageous to introduce a glossary of terms/abbreviations that will be referred to in the analysis. The correlation matrix related to the eleven continuous variables included in the glossary is shown in Appendix C. The correlation matrix provides credibility to the proposed research model depicted in Figure 1. OrgId is significantly correlated with the four components of communication technology usage (OffTech; MobiTech; OldTech; NewTech), Needaff and OrgJust. In addition, WorkSuc is significantly correlated with OrgId and OrgJust).

Table 8

Glossary of Terms/Abbreviations

Term/Abbreviation	Meaning
OrgId	Organizational identification (continuous variable)
WorkSuc	Work success (continuous variable)
Age	How old the respondent is in years (continuous variable)
Tenure	Number of years working for the organization (continuous variable)
Dependents	Number of dependents in the household (continuous variable)
Gender	Dummy variable taking on a value of 1 for female and 0 for male
Marital Status	Dummy variable taking on a value of 1 for married/domestic partnership and 0 for single
Education 1	Dummy variable taking on a value of 1 for associate degree and 0 otherwise
Education 2	Dummy variable taking on a value of 1 for college degree and 0 otherwise
Education 3	Dummy variable taking on a value of 1 for a master's/ doctorate degree and 0 otherwise
OffTech	Office technology usage (continuous variable)
MobTech	Mobile technology usage (continuous variable)
OldTech	Older technology usage (continuous variable)
NewTech	New technology usage (continuous variable)
NeedAff	Need for Affiliation (continuous variable)
OrgJust	Organizational justice (continuous variable)
Vstatus	Dummy variable taking on a value of 1 for non-telecommuters and 0 for telecommuters
TC Policy	Dummy variable taking on a value of 1 for an organization employing a formal telecommuting policy and o if not
TC Req	Dummy variable taking on a value of if telecommuting is required for job and 0 if not

Table 9

Results of Hierarchical Regression Analysis for Organizational Identification

Hypothesis/ Variable	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Estimate p-value	Estimate p-value	Estimate p-value	Estimate p-value	Estimate p-value	Estimate p-value	Estimate p-value
Constant	-0.123 (0.512)	0.093 (0.599)	0.40 (0.784)	0.103 (0.471)	0.028 (0.847)	0.100 (0.499)	0.028 (0.850)
Age	-0.018*** (0.002)	-0.008$^+$ (0.147)	-0.007 (0.104)	-0.002 (0.595)	-0.003 (0.482)	-0.003 (0.517)	-0.003 (0.432)
Tenure	0.008$^+$ (0.330)	0.006 (0.451)	0.009 (0.188)	0.008 (0.213)	0.007 (0.234)	0.008 (0.197)	0.008 (0.217)
Dependents	0.083$^+$ (0.138)	0.013 -(0.806)	0.033 -(0.430)	0.002 -(0.969)	0.004 (0.927)	0.005 (0.911)	0.008 (0.837)
Gender	0.188 (0.214)	0.182 (0.193)	0.130 (0.254)	0.155 (0.290)	0.123 (0.256)	0.108 (0.325)	0.115 (0.294)
Marital Status	-0.156 (0.342)	-0.188 (0.214)	-0.182$^+$ (0.139)	-0.192* (0.100)	-0.184$^+$ (0.116)	-0.208* (0.077)	-0.194* (0.100)
Education 1	0.052 (0.803)	-0.010 (0.957)	0.151 (0.330)	0.118 (0.424)	0.155 (0.301)	0.126 (0.393)	0.156 (0.294)
Education 2	0.023 (0.909)	-0.320* (0.100)	-0.156 (0.296)	-0.317** (0.038)	-0.246$^+$ (0.111)	-0.309** (0.042)	-0.250* (0.105)
Education 3	0.339$^+$ (0.133)	-0.052 (0.811)	0.031 (0.853)	-0.156 (0.356)	-0.132 (0.433)	-0.171 (0.309)	-0.147 (0.380)
OffTech H1a		0.032 (0.514)		0.016 (0.694)	0.021 (0.602)	0.015 (0.774)	0.011 (0.841)
MobiTech H1a		0.196*** (0.000)		0.088** (0.019)	0.087** (0.042)	0.117* (0.070)	0.106$^+$ (0.106)
OldTech H1a		0.037 (0.549)		0.037 (0.445)	0.001 (0.983)	-0.071 (0.281)	-0.100 (0.161)
NewTech H1a		-0.072 (0.205)		-0.059 (0.176)	-0.046 (0.298)	0.040 (0.520)	0.053 (0.411)
NeedAff H1b		0.357*** (0.000)		0.275*** (0.000)	0.259*** (0.000)	0.394*** (0.000)	0.373*** (0.000)
OrgJust			0.595*** (0.000)	0.536*** (0.000)	0.581*** (0.000)	0.540*** (0.000)	0.585*** (0.000)
Vstatus			-0.053 (0.636)	0.031 (0.789)	-0.008 (0.947)	0.046 (0.692)	0.009 (0.939)
OffTech x OrgJust H3a					-0.001 (0.957)		0.008 (0.760)
MobiTech x OrgJust H3a					0.038 (0.209)		0.038 (0.204)
OldTech x OrgJust H3a					0.007 (0.887)		0.018 (0.708)
NewTech x OrgJust H3a					0.008 (0.802)		-0.004 (0.906)
NeedAff x OrgJust H3b					0.038 (0.281)		0.027 (0.442)

Table 9 (Continued)

MobiTech x Vstatus H2a						0.037 (0.654)	0.041 (0.628)
OldTech x Vstatus H2a						-0.030 (0.706)	-0.030 (0.709)
NewTech x Vstatus H2a						0.204** (0.035)	0.187* (0.055)
NeedAff x Vstatus H2b						-0.176** (0.039)	-0.173** (0.048)
ΔR^2 (from Model 0)		0.174***	0.421***	0.487***	0.499***	0.505***	0.516***
ΔR^2 (from Model 1)				0.313***			
ΔR^2 (from Model 3)					0.012	0.018*	0.029*
R^2	0.069	0.243	0.490	0.556	0.568	0.574	0.585
F Model	2.369	6.142	24.256	20.607	15.920	16.310	13.360
df (.,.)	(8, 254)	(13, 249)	(10, 252)	(15, 247)	(20, 242)	(20, 242)	(25, 237)
p-value	0.018	0.000	0.000	0.000	0.000	0.000	0.000
Max VIF	1.625	2.639	1.663	2.654	3.496	5.968	6.237

$^+p < 0.15$, $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (all reported t-tests are two-tailed)

Table 10

Results of Hierarchical Regression Analysis for Work Success

Hypothesis/ Variable	Model 0	Model 1
	Std. Estimate p-value	Std. Estimate p-value
Constant	-0.137 (0.451)	-0.037 (0.766)
Age	-0.019*** (0.001)	-0.004 (0.359)
Tenure	0.001 (0.882)	-0.001 (0.919)
Dependents	0.089+ (0.101)	0.018 (0.608)
Gender	0.134 (0.363)	0.059 (0.538)
Marital Status	-0.087 (0.586)	-0.080 (0.439)
Education 1	-0.014 (0.945)	0.029 (0.823)
Education 2	0.169 (0.380)	-0.007 (0.955)
Education 3	0.259 (0.237)	-0.095 (0.501)

Table 10 (Continued)

OrgID H6		0.293*** (0.000)
OrgJust H4		0.447*** (0.000)
Vstatus H5		-0.070 (0.452)
TC Policy		0.105 (0.304)
TC Req		0.181^+ (0.119)
ΔR^2 (from Model 0)		0.560***
R^2	0.073	0.633
F Model	2.488	33.052
df (.,.)	(8, 254)	(13, 249)
p-value	0.013	0.000
Max VIF	1.625	2.032

$^+p < 0.15$, $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (all reported t-tests are two-tailed)

In Table 9 for which the dependent variable is OrgId, Model 0 tests the effect of the control variables of Age (a continuous variable), Tenure (a continuous variable), Number of Dependents (a continuous variable), Gender (a dummy variable), Marital Status (a dummy variable), and Level of Education (represented by three dummy variables) on organizational identification. These control variables explain a little amount of variance ($R^2 = 0.069$). Model 1 examines the effect of the independent variables (OffTech, MobiTech, OldTech, NewTech and NeedAff) on organizational identification. The variables explain a significant amount of variance in organizational identification beyond the control variables ($\Delta R^2 = 0.174$, $p < 0.01$). Model 2 tests the predictive effect of potential moderating variables (OrgJust and Vstatus) on organizational identification, which explain a significant amount of variance beyond the control variables ($\Delta R^2 = 0.421$, $p < 0.01$). Model 3 tests the combined effect of the independent and potential moderating variables on organizational identification. As shown in Table 8, the change from Model 0 is significant ($\Delta R^2 = 0.487$, $p < 0.01$) and the change from Model 2 is also

significant (ΔR^2 = 0.066, p < 0.01). Model 4 examines the interaction effect of organizational justice (OrgJust) on the five independent variables, whereas Model 5 examines the interaction effect of virtual status (Vstatus) on the same independent variables. Only the interaction effects related to virtual status turn out to be significant. For Model 5, the change in the ΔR^2 from Model 3 is significant (ΔR^2 = 0.018, p < 0.05).

Model 6 which is significant (ΔR^2 from Model 0 = 0.516, p < 0.01) is used to test the dissertation's hypotheses associated with the organizational identification dependent variable. In Table 8, only MobiTech is a positive and significant predictor (b = 0.106, p < 0.10 using a one-tailed t-test), implying a partial support of hypothesis H1a. NeedAff is a positive and significant predictor (b = 0.373, p < 0.01 using a one-tailed t-test), providing support to hypothesis H1b. The interaction effect between virtual status and OldTech has a significant impact on organizational identification (b = 0.187, p < 0.10 using a two-tailed t-test). Also, the interaction effect between virtual status and NewTech has a significant impact on organizational identification (b = -0.173, p < 0.05 using a two-tailed t-test). These findings provide a partial support to hypothesis H2a. The interaction effect between virtual status and NeedAff has a negative significant impact on organizational identification (b = -0.220, p < 0.05 using a one-tailed t-test), and thus hypothesis H2b is supported. Only the interaction effect between organizational justice and MobiTech has a positive significant impact on organizational identification (b = 0.038, p < 0.15 using a one-tailed t-test), and thus providing a partial support to hypothesis H3a. The interaction effect between organizational justice and NeedAff though positive, is insignificant (b = 0.027, p > 0.15 using a one tailed t-test). Therefore, hypothesis H3b is not supported.

In Model 6, only two control variables turn out to be significant, Martial Status and Education Level (Marital Status b= - 0.194, p < 0.10 using a two-tailed t-test and Education 2 = - 0.250, p < 0.15 using a two tailed t-test). The Max VIF for Models 0-6 lies within the range of 1.625 for Model 0 and 6.237 for Model 6. These levels of VIF indicate that multicollinearity is of minor concern (Kutner, et al., 2005, and Hair, et al., 2010). It is interesting to note that the minimum calculated statistical power for each estimated regression model (Model 0 through Model 6 in Table 9), given its observed p-value, the number of predictors, the observed R^2, and the sample size (263) was 0.8061. This level of statistical power is attributed to Model 0. The statistical powers related to the remaining models are close to unity.

In Table 10, Model 0 tests the effect of the same control variables considered in Table 9 on the dependent variable of employee work success (WorkSuc). Once more, these control variables explain a small amount of variance (ΔR^2 = 0.560, p < 0.01). Model 1 examines the effect of the independent variables (OrgId, OrgJust, VStatus, TC Req and TC Policy) on work success. The variables explain a significant amount of variance in work success beyond the control variables (ΔR^2 = 0.560, p < 0.01). Hypothesis H4 is supported as organizational identification positively and significantly affects employee work success (OrgId b = 0.293, p < 0.01 using a one-tailed t-test). Hypothesis H6 is also supported as organizational justice shows a positive significant influence on work success (OrgJust b= 0.447, p < 0.01 using a one-tailed t-test). Hypothesis H5 is not supported as no positive significant relationship between virtual status and employee work success is detected (Vstatus b=- 0.070, p > 0.15 using a one-tailed t-test). The results of hypotheses testing are summarized in Table 11.

Table 11

Summary of Findings

Hypotheses	
Hypothesis	**Supported/Not Supported**
H1a: Communication technology usage **positively** influences organization identification.	Partially Supported
H1b: Need for affiliation **positively** influences organizational identification.	Supported
H2a: Employees virtual status moderates the relationship between communication technology usage and organizational identification.	Partially Supported
H2b: Employee virtual status **negatively** moderates the relationship between need for affiliation and organizational identification.	Supported
H3a: Organizational justice **positively** moderates the relationship between communication technology usage and organizational identification.	Partially Supported
H3b: Organizational justice **positively** moderates the relationship between need for affiliation and organizational identification.	Not Supported
H4: Organizational justice influences **positively** employee work success.	Supported
H5: Employee virtual status **positively** influences employee work success.	Not Supported
H6: Organizational identification **positively** influences employee work success.	Supported

In Model 1 (as summarized in Table 10) and upon using two-tailed t-tests, TC Req is found to have a significant relationship with employee work success ($b = 0.181$, $p < 0.15$), whereas TC Policy does not ($b = 0.105$, $p > 0.15$). In addition, none of the control variables turns out to be significant. Multicollinearity is proven to be of no concern as the Max VIF for Model 0 is 1.625 and 2.032 for Model 1. It is interesting to note that the minimum calculated statistical power for each estimated regression model (Model 0 and Model 1 in Table 10), given its observed p-value, the number of predictors,

the observed R^2, and the sample size (263) was 0.8070. This level of statistical power is attributed to Model 0. The statistical power related to Model 1 is close to unity.

The main estimated model in Table 9 (Model 6) and the main estimated model in Table 10 (Model1) turned out to be of adequate specifications (see next section for details). Additional desirable properties possessed by these two models (namely, absence of outliers, normality and constant variance of the error terms, together with the absence of multicollinearity concerns) are shown in Appendix D. Such findings provide additional credibility to the stated two models.

Testing for Model Misspecification

Diagnostic testing is a popular research topic that aims at identifying better modeling approaches. An example of a diagnostic test, articulated by James B. Ramsey (see Maddala, 1988; Thursby, 1989), is the RESET test (Regression Specification Error Test). The test is designed to detect omitted variables and incorrect functional forms. The testing procedure together with its application in conjunction with Model 6 estimated in Table 9 for which the dependent variable is organizational identification and Model 1 estimated in Table 10 for which the dependent variable is work success is highlighted.

Consider the multiple regression model of p −1 independent variables

$$y_i = B_0 + B_1 x_{i1} + B_2 x_{i2} + ... + B_{p-1} x_{ip-1} + \epsilon_i \, ,$$

where ϵ_i is the usual random error term. The least squares estimates of the parameters are b_0, b_1, b_2, ..., b_{p-1}. The fitted or the predicted values, y_{if}, are

$$y_{if} = b_0 + b_1 x_{i1} + b_2 x_{i2} + ... + b_{p-1} x_{ip-1} \, .$$

To answer the question whether the model represents a good specification, one creates an artificial model that includes the extra explanatory variable y_{if}^2. If the

coefficient of this extra variable is significantly different from zero, this will suggest that the original model is misspecified. The artificial model is

$$y_i = B_0 + B_1 x_{i1} + B_2 x_{i2} + \ldots + B_{p-1} x_{ip-1} + \gamma_1 y_{if}^2 + u_i \text{ (} u_i \text{ is a random error)}. \quad (1)$$

The artificial model can be estimated by least squares. The hypothesis of interest is

$H_0: \gamma_1 = 0$ against $H_1: \gamma_1 \neq 0$.

A t-statistic and p-value can be obtained from the least squares estimation output. Rejection of the null hypothesis implies that the test has detected misspecification.

Two other versions for the artificial model are

$$y_i = B_0 + B_1 x_{i1} + B_2 x_{i2} + \ldots + B_{p-1} x_{ip-1} + \gamma_1 y_{if}^2 + \gamma_2 y_{if}^3 + u_i . \quad (2)$$
$$y_i = B_0 + B_1 x_{i1} + B_2 x_{i2} + \ldots + B_{p-1} x_{ip-1} + \gamma_1 y_{if}^2 + \gamma_2 y_{if}^3 + \gamma_3 y_{if}^4 + u_i . \quad (3)$$

For the artificial model (2), the hypothesis of interest is

$H_0: \gamma_1 = \gamma_2 = 0$ against H_1: At least one $\gamma \neq 0$.

This is a joint hypothesis test and so an F-test statistic is required. The F-test statistic can be compared with an F-distribution with $(2, n - p - 2)$ degrees of freedom, and n is the number of observations.

For the artificial model (3), the hypothesis of interest is

$H_0: \gamma_1 = \gamma_2 = \gamma_3 = 0$ against H_1: At least one $\gamma \neq 0$.

In this case, the F-test statistic is compared with an F-distribution with $(3, n - p - 3)$ degrees of freedom.

In each case, rejection of the null hypothesis suggests some general model misspecification in the original regression equation.

The application of the RESET test in conjunction with Model 6 estimated in Table 9 and Model 1 estimated in Table 10 brings about the results shown in Table 12.

Table 12

Results of RESET Test

Hypothesis H_0	Model 6 – Table 8 F-statistic (p-value)	Model 1 – Table 9 F-statistic (p-value)
$\gamma_1 = 0$	2.9405 (0.0877)	0.2342 (0.6289)
$\gamma_1 = \gamma_2 = 0$	2.7948 (0.0632)	2.1509 (0.1186)
$\gamma_1 = \gamma_2 = \gamma_3 = 0$	2.1579 (0.0937)	2.1550 (0.0939)

Considering a critical α value of 0.05, the results indicate that both Model 6 (estimated in Table 9) and Model 1 (estimated in Table 10) are not misspecified.

On the Mediating Role of Organizational Identification

The research model depicted in Figure 1 asserts that organizational identification is a mediating construct. Its main antecedents are the constructs of communication technology usage, and need for affiliation whereas its consequence is the construct of work success. This section aims at empirically examining the validity of the pivotal assertion.

The approach employed to assess mediation is based on the seminal work of Baron and Kenny (1986). For organizational identification (OrgId) to be a mediator, the analysis requires three regressions to be estimated. They are

(i) First, the dependent variable (work success) must be predicted from the independent variables including the demographic variables, communication technology usage, need for affiliation, organizational justice and virtual status.

(ii) Second, the mediator (OrgId) must be predictable from the independent variables.

(iii) Third, the dependent variable must be predictable from the combined independent variables and the mediator.

Mediation is considered occurring if the mediator (OrgId) is significant in the third regression equation and the effects of the independents variables are reduced. Studies that have used the approach for mediation detection include Constant, et al., (1994) and He, et al., (2004).

Table 13 shows that the potential mediator (OrgId) is significantly affected by the independent variables of Marital Status, Education 2, MobiTech, NeedAff and OrgJust at the 0.10 or better level of significance (Model 1). Model 3 is significantly affected by organizational identification (OrgId). In addition, Models 2 and 3 are significantly affected by OrgJust with a coefficient of 0.442 in Model 3 that is smaller than its counterpart in Model 2 (0.612). Similarly, Models 2 and 3 are significantly affected by the variable TC Req with a coefficient of 0.185 that is smaller than its counterpart in Model 2 (0.252). Therefore, the requirements stated in Baron and Kenny (1986) are met. Furthermore, in Model 3, the technological factor NewTech turns out to be significant.

Table 13

Testing for the Mediating Role of OrgId

Model/ Dependent Variable	Model 1 Moderator (OI)	Model 2 Work Success	Model 3 Work Success
	Estimate p-value	Estimate p-value	Estimate p-value
Constant	0.103 (0.471)	0.008 (0.957)	-0.001 (0.994)
Age	-0.002 (0.595)	-0.003 (0.434)	-0.003 (0.498)
Tenure	0.008 (0.213)	0.001 (0.853)	-0.002 (0.777)
Dependents	0.002 (0.969)	0.020 (0.596)	0.020 (0.563)
Gender	0.155 (0.290)	0.098 (0.340)	0.056 (0.563)
Marital Status	-0.192* (0.100)	-0.126 (0.253)	-0.063 (0.548)
Education 1	0.118 (0.424)	0.051 (0.715)	0.017 (0.899)
Education 2	-0.317** (0.038)	-0.109 (0.445)	-0.008 (0.951)
Education 3	-0.156 (0.356)	-0.143 (0.368)	-0.098 (0.513)
OffTech	0.016 (0.694)	0.006 (0.872)	0.000 (1.000)
MobiTech	0.098** (0.019)	-0.016 (0.002)	-0.044 (0.241)
OldTech	0.037 (0.445)	0.002 (0.967)	-.004 (0.930)
NewTech	-0.059 (0.176)	0.050 (0.243)	0.069* (0.087)
NeedAff	0.275*** (0.000)	0.035 (0.567)	-0.052 (0.376)
OrgJust	0.536*** (0.000)	0.612*** (0.000)	0.442*** (0.000)
Vstatus	0.031 (0.789)	-0.095 (0.382)	-0.107 (0.293)
TC Policy		0.063 (0.589)	0.056 (0.613)
TCReq		0.252* (0.053)	0.185+ (0.133)
OrgId (OI)			0.316 (0.000)
R²	0.556	0.593	0.639
F Model	20.607	21.026	24.941
df (. , .)	(15 , 247)	(17 , 245)	(18 , 244)
p-value	0.000	0.000	0.000
Max VIF	2.654	2.912	2.934

+p < 0.15, *p < 0.10, **p < 0.05, ***p < 0.01 (all reported t-tests are two-tailed)

The findings imply that

(1) Organizational identification (OrgId) is indeed a mediator. OrgId is a "partial mediator" rather than a "pure" one as Organizational Justice affects Work Success directly (Model 3) and indirectly through the mediator OrgId (organizational justice is significant in both Models 1 and 2).

(2) Communication technology usage, through its NewTech component, possesses a direct influence on Work Success (Model 3).

Virtual Status – Communication Technology Usage Relationship

This section sheds light on the relationship between employee's virtual status and communication technology usage together with the proportion of usage of each of the 22 communication technology devices considered in this dissertation.

Table 14 provides multiple regression results relating each of the dependent variables (OffTech, MobiTech, OldTech, NewTeck) to virtual status (Vstatus), controlling for the effect of the demographic variables. It is noted that Vstatus takes on the value zero for Telecommuters and one for Non-Telecommuters. In the table, the coefficient of Vstatus is positive and significant for the OffTech regression (b = 0.741, p-value < 0.01) and negative and significant for the MobiTech regression (b = - 0.852, p-value < 0.01). The coefficients of Vstatus are insignificant for the OldTech and NewTech regressions (b = - 0.0248, p-value = 0.209 and b = - 0.071, p-value = 0.752, respectively).

Table 14

Multiple Regression Results for Different Technology Types

Model/ Dependent Variable	Model 1 OffTech	Model 2 MobiTech	Model 3 OldTech	Model 4 NewTech
	Estimate p-value	Estimate p-value	Estimate p-value	Estimate p-value
Constant	-1.140***	-0.613**	-0.389+	-0.820***
	(0.000)	(0.030)	(0.130)	(0.005)
Age	-0.005	-0.022**	-0.031***	-0.038***
	(0.504)	(0.012)	(0.000)	(0.000)
Tenure	0.007	0.009	0.014	0.014
	(0.495)	(0.462)	(0.239)	(0.285)
Dependents	0.188***	0.227***	0.135*	0.137+
	(0.006)	(0.005)	(0.067)	(0.101)
Gender	0.319*	0.002	0.155	0.073
	(0.085)	(0.992)	(0.868)	(0.751)
Marital Status	0.253	-0.018	-0.033	-0.150
	(0.205)	(0.940)	(0.632)	(0.542)
Education 1	0.523**	0.601**	0.104	0.519*
	(0.038)	(0.045)	(0.436)	(0.094)
Education 2	0.570**	1.873***	0.213***	1.480***
	(0.018)	(0.000)	(0.001)	(0.000)
Education 3	0.704***	1.730***	0.992***	1.497***
	(0.010)	(0.000)	(0.009)	(0.000)
Vstatus	0.741***	-0.852***	0.780	-0.071
	(0.000)	(0.000)	(0.209)	(0.752)
R^2	0.140	0.253	0.130	0.186
F Model	4.580	9.535	4.193	6.402
df (. , .)	(9 , 253)	(9 , 253)	(9 , 253)	(9 , 253)
p-value	0.000	0.000	0.000	0.000
Max VIF	1.648	1.648	1.648	1.648

+p < 0.15, *p < 0.10, **p < 0.05, ***p < 0.01 (all reported t-tests are two-tailed)

These findings lead to the following conclusions:

(i) On average, employees of low telecommuting intensity (Non-Telecommuters) use the devices associated with the OffTech factor significantly larger than their high telecommuting intensity counterparts (Telecommuters).

(ii) On average, employees of low telecommuting intensity use the devices associated with the MobiTech factor significantly smaller than their high telecommuting intensity counterparts.

(iii) On average, employees of low telecommuting intensity use the devices associated with the OldTech factor not significantly different from their high telecommuting intensity counterparts.

(iv) On average, employees of low telecommuting intensity use the devices associated with the NewTech factor not significantly different from their high telecommuting intensity counterparts.

Upon computing the usage percentage of each of the 22 devices and ranking such percentages in a descending order one time for Non-Telecommuters and another time for Telecommuters, the results are displayed in Table 15. Spearman's rank correlation coefficient is 0.9116 of p-value < 0.005 using a two-tailed test and Kendall's τ coefficient of concordance is 0.77226 of p-value $= 7.1525 \times 10^{-7}$. These results imply consistency in the rankings of the percentages of usage of the 22 devices for the two groups. Table 13 reports the overall combined percentage of usage of the 22 devices together with their related rankings in a descending order. It is interesting to note that the usage percentages are the highest for devices belonging to Office Technologies. The usage percentages are the lowest for devices belonging to Older Technologies. The usage percentages of devices belonging to both the Mobile Technologies and New Technologies lie in between.

Table 15

Percentage of Usage of 22 Devices and Related Ranks

Device	Telecommuters %	Rank	Non-Telecom. %	Rank	Overall Usage	Rank	Tech. Type
Internet	91.06	1	97.14	2	94.30	1	Office
Printer	87.80	3.5	98.57	1	95.53	2	Office
Email	88.62	2	94.29	4	91.63	3	Office
Phone	81.30	5	96.43	3	89.53	4	Office
Desktop	77.24	7	87.14	5	82.51	5	Office
Fax	73.17	9	81.43	6	77.57	6	Office
Smart Phone	87.80	3.5	65.00	9.5	77.66	7	Mobile
Laptop	76.42	8	67.86	9.5	71.86	8	Mobile
Texting	79.67	6	62.68	11	70.72	9	Mobile
Collab. Software	62.60	10.5	66.43	8	64.64	10	New
Digital Signature	63.41	10.5	62.14	12	62.74	11	New
Instant Messages	58.54	12	65.00	9.5	61.98	12	New
VPN	51.22	17	55.00	13	53.23	13	New
Tele-conference	53.66	16	52.14	14	52.85	14	New
GPS	60.16	12	45.71	16.5	52.47	15	Mobile
Tablet	57.72	14	46.34	15	51.71	16	Mobile
Social Networks	56.91	16	45.71	14	50.95	17	Mobile
Cloud Computing	46.34	18	45.00	18	45.62	18	New
Wikis	40.65	19	35.00	19	37.64	19	Older
Message Boards	37.40	20	30.71	20	33.84	20	Older
Chat Rooms	30.89	22	27.85	21	29.27	21	Older
Virtual Reality	31.70	21	21.43	22	26.24	22	Older

Upon comparing the usage percentage of each of the 22 devices for Non-Telecommutes and Telecommuters, the following conclusions are arrived at:

1.   The usage percentage of employees of high telecommuting intensity is significantly larger than their counterparts for the following seven devices: Tablet, Laptop, Smart Phone, GPS, Text Messaging, Social Media and Virtual Reality (all

devices belonging to Mobil Technologies, in addition to the Virtual Reality device that belongs to Older Technologies).

2. The usage percentage of employees of high telecommuting intensity is significantly smaller than their counterparts for the following five devices: Desktop, Printer, Fax, Internet and Email (all devices belonging to Office Technologies, except for Telephone).

3. No significant difference in usage percentage for the following devices: Phone, Instant Messaging, Digital Signatures, VPN, Teleconferences, Chat Rooms, Message Boards, Wikis, Collaborative Software, and Cloud Computing (mostly devices that belong to both New and Older Technologies).

The conclusions have been arrived at through employing a Z-test statistic (two-tailed) for the equality of two population proportions (Table 16). More importantly, the results of the last analysis appears mostly consistent with the results of the analysis performed at the beginning of this section.

Taken together, the results of this section imply that there is a significant relationship between employee's virtual status and his/ her communication technology usage.

Table 16

Comparison of Percentage Usage of 22 Devices

Device	Telecommuters %	Non-Telecom. %	Z-Stat. (p-value)
Internet	91.06	97.14	-2.1235**(0.0340)
Printer	87.80	98.57	-3.5431***(0.0004)
Email	88.62	94.29	-1.6565*(0.0969)
Phone	81.30	96.43	-0.4836 (0.63122)
Desktop	77.24	87.14	-2.1102**(0.0348)
Fax	73.17	81.43	-0.1602+(0.1096)
Smart Phone	87.80	65.00	4.3004*** (<0.01)
Laptop	76.42	67.86	1.5414+ (0.1235)
Texting	79.67	62.68	2.9906*** (0.0027)
Collab. Software	62.60	66.43	-0.6477 (0.5157)
Digital Signature	63.41	62.14	0.2128 (0.8336)
Instant Messages	58.54	65.00	-1.0774 (0.2801)
VPN	51.22	55.00	- 0.6131 (0.5418)
Tele-conference	53.66	52.14	0.2457 (0.8025)
GPS	60.16	45.71	2.3411**(0.0192)
Tablet	57.72	46.34	1.8290* (0.0672)
Social Networks	56.91	45.71	1.8123* (0.0703)
Cloud Computing	46.34	45.00	0.2179 (0.8258)
Wikis	40.65	35.00	0.9437 (0.3472)
Message Boards	37.40	30.71	1.1431 (0.2542)
Chat Rooms	30.89	27.85	0.5401 (0.5892)
Virtual Reality	31.70	21.43	1.8906* (0.0587)

+p < 0.15, *p < 0.10, **p < 0.05, ***p <0.01

Exploring the Interaction Effects and Consequences of Data Analysis

This section aims at shedding more light on the interaction terms found significant associated with Model 6 estimated in Table 10. Also, the section introduces a revised

version of the research model depicted in Figure 1 as a consequence of all the data analysis performed in previous sections.

As far as Model 6 is concerned, the interaction terms OldTech x Vstatus, NewTech x Vstatus and NeedAff x Vstatus are found significant using two-tailed t-tests together with the interaction term MobiTech x OrgJust using a one-tailed t-test. Each of the first three terms represents an interaction between a continuous variable and a moderating dummy variable (Vstatus) whereas the fourth term represents an interaction between a continuous variable and a moderating continuous variable (OrgJust).

To explore the nature of the interactions related to the first three terms, organizational identification is regressed on each of the three variables NewTech, OldTech, and NeedAff one time for Telecommuters (Vstatus = 0) and another time for Non-Telecommuters (Vstatus = 1). To investigate the nature of the interaction related to the fourth term, median splits were conducted on OrgJust variable (Pedhazur, 1982). Organizational identification was then regressed one time on the MobiTech variable of the Low OrgJust group and another time on the MobiTech variable of the High OrgJust group. The regression results are shown in Tables 17 and 18. All the estimated coefficients turned out positive and significant.

Table 17

Regression Results for Telecommuters and Non Telecommuters

	Telecommuters	Non-Telecommuters
Intercept	0.085	-0.075
New Tech	0.185***	0.127**
R^2	0.088	
Intercept	0.064	-0.041
Older Tech	0.161***	0.271***
R^2	0.055	0.116
Intercept	0.062	-0.057
Need for Affiliation	0.523***	0.473***
R^2	0.165	0.130
n	123	140

$p < 0.05$,*$p < 0.01$

Table 18

Regression Results for Low and High OrgJust Groups

	Low OrgJust	High OrgJust
Intercept	-0.662***	0.647***
MobiTech	0.149***	0.128***
R^2	0.083	0.063
n	129	134

***$p < 0.01$

Figure 2 provides graphic representations of the interactions. Points were plotted for strength of organizational identification one standard deviation below the mean of each variable (NewTech, OldTech, NeedAff, MobiTech) and one standard deviation above the mean. Figures 2 (a, c) suggest that an increase in each of the related variables creates a positive psychological link between the individuals and the organization which is stronger for Telecommuters than Non-Telecommuters.
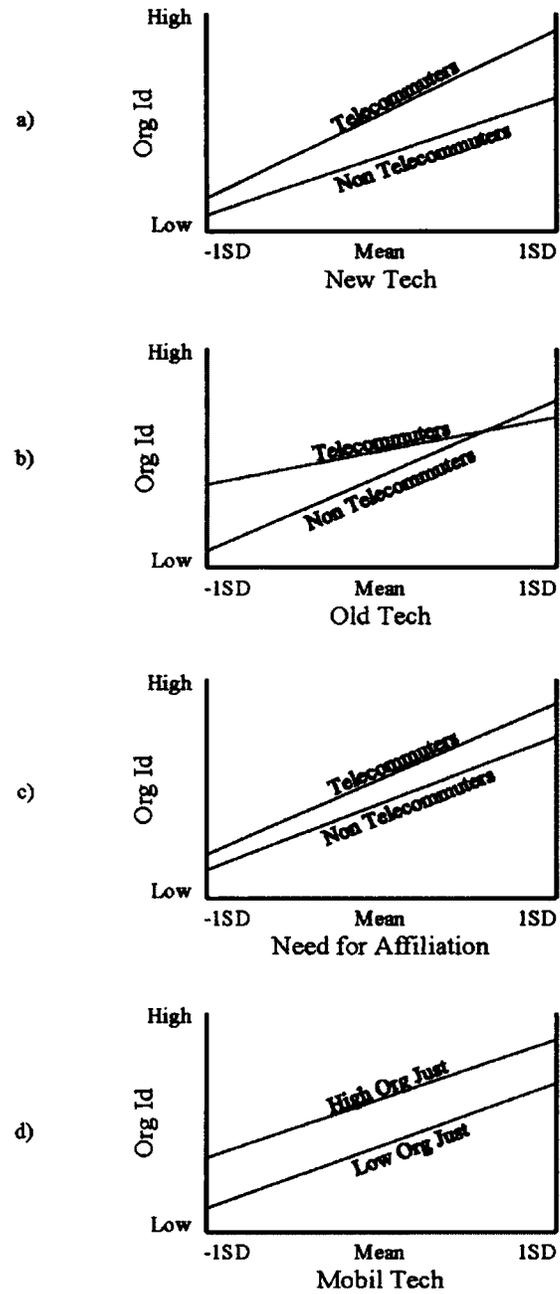
Figure 2 *Interaction Effects*

Furthermore, the level of organizational identification within the considered range of each variable is higher for Telecommuters than Non-Telecommuters. Figure 2 (b) on the- other- hand, though showing that the related variable creates a psychological link between the individuals and the organization, such a link is stronger for Non-Telecommuters than for Telecommuters. While the level of organizational identification is higher for Telecommuters at small values of the related variable, it is higher for Non-Telecommuters at large values of the variable within the considered range. Finally, Figure 2 (d) is interpreted the same way as Figure 2 (a, c) upon replacing Telecommuters with High OrgJust and replacing Non- Telecommuters with Low OrgJust. This section turns next to discussing the revised research model.

Based on the results of hypotheses testing, the established relationship between Virtual Status and Communication Technology Usage, the validated mediating role of Organizational Identification and proven adequacy of model specifications, the revised aggregate research model is shown in Figure 3. The revised research model at the aggregate level shows the existence of a direct link connecting Communication Technology Usage to Work Success. The hypothesized link between Employee's Virtual Status and Work Success in the original research model is now replaced with a link connecting Employee's Virtual Status to Communication Technology Usage. Such a modification implies that Employee's Virtual Status affects Work Success indirectly (through Communication Technology Usage and/ or Need for Affiliation, and/or Organizational Identification) rather than affecting Work Success directly.
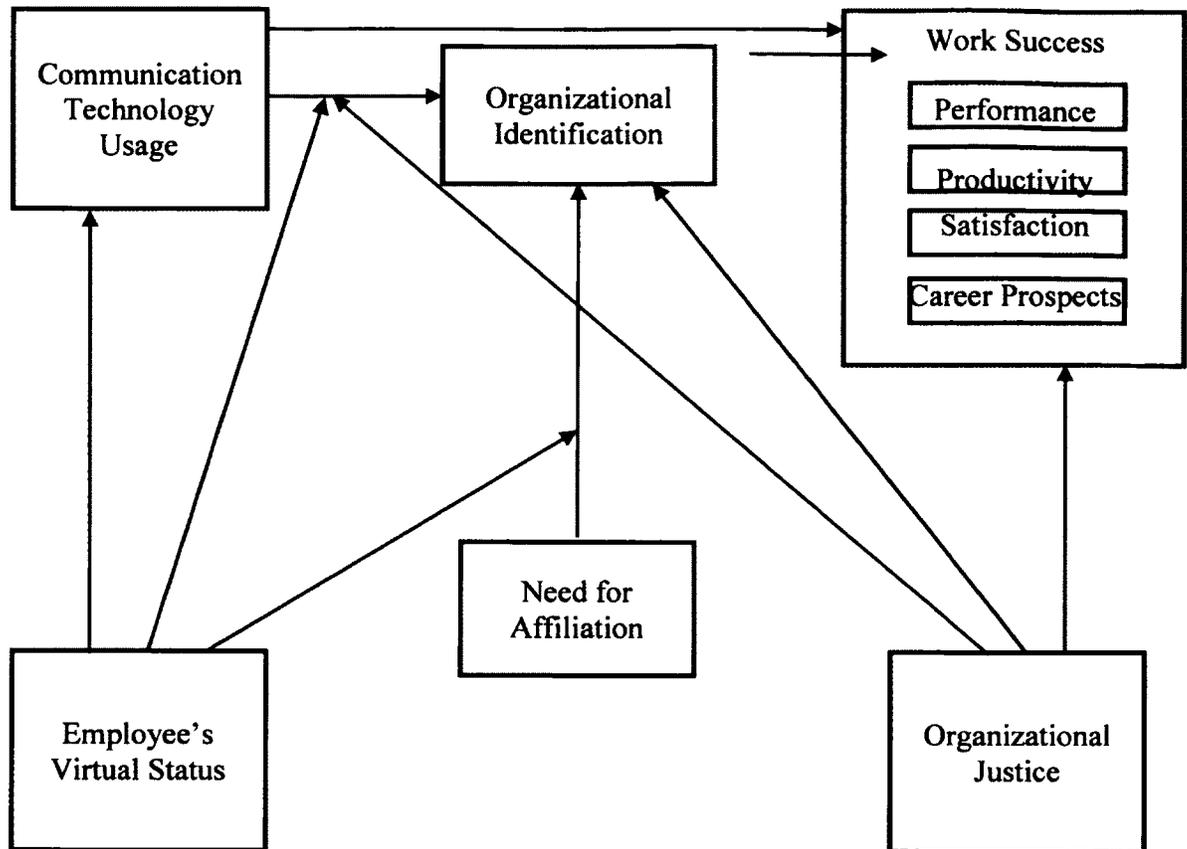
Figure 3 *Revised Aggregate Research Model*

Upon demonstrating earlier that Communication Technology Usage is a multidimensional construct, the revised disaggregate research model is shown in Figure 4. Figure 4 shows that the direct link between Communication Technology Usage and Work Success is specifically attributed to the usage of New Technologies. Usage of Office Technologies does not exert any influence on either Organizational Identification or Work Success. In addition, Employee's Virtual Status affects Organizational Identification through moderating the relationship between Need for Affiliation and Organizational Identification together with the combined interaction effects with New and Older Technologies.
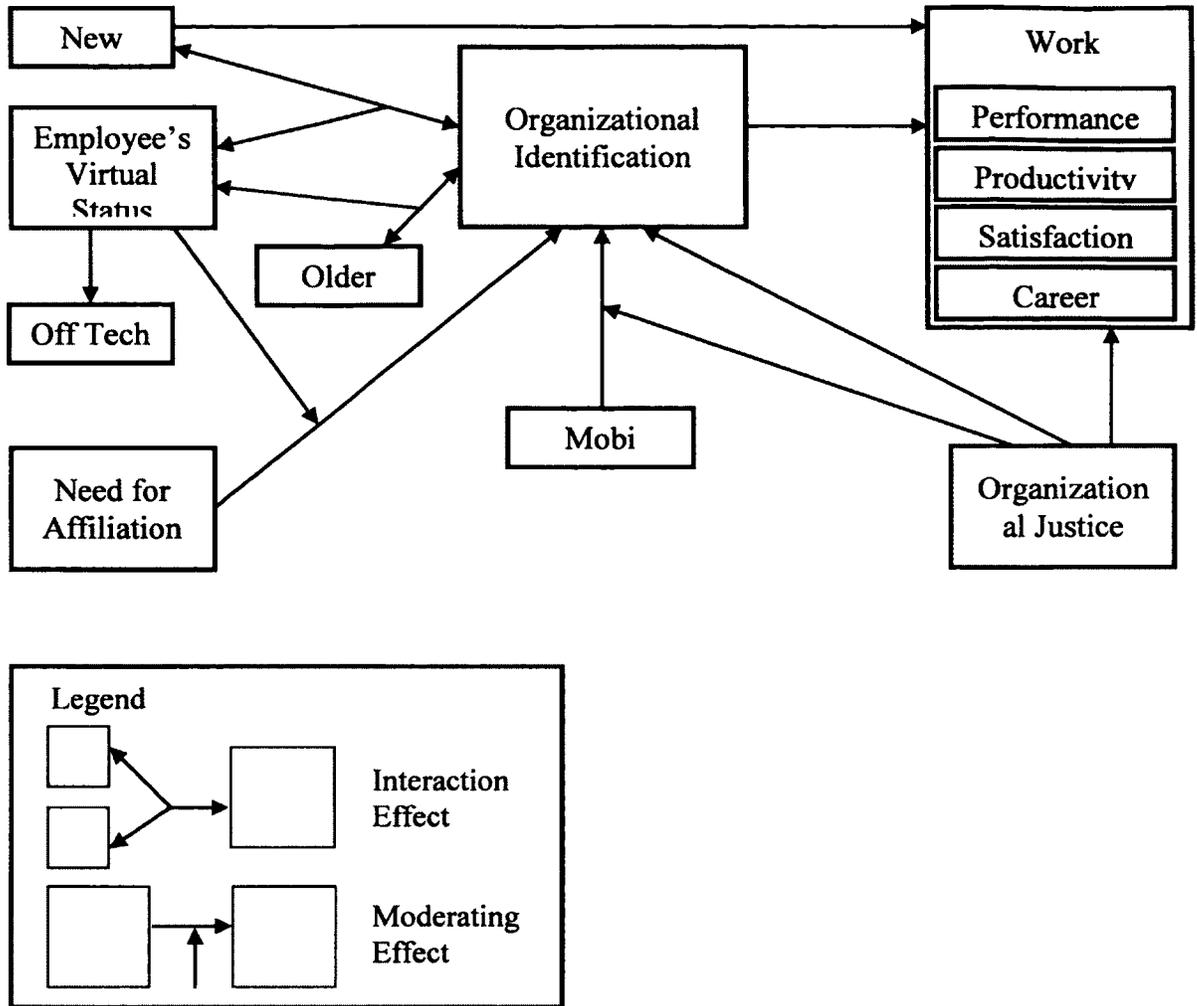
Figure 4 *Revised Disaggregate Research Model*

CHAPTER FIVE

CONCLUSIONS

The present chapter will discuss the findings and conclusions of the research. The contributions to both theory and IS practice will be discussed, along with the limitations of this research. Lastly, topics for future study will be introduced.

Findings

This research effort began by asking the following questions on theoretical grounds: Do organizational justice and employee's virtual status moderate the relationship between communication technology usage and organizational identification? Do organizational justice and employee's virtual status moderate the relationship between need for affiliation and organizational identification? Do organizational identification, organizational justice, and employee's virtual status help explain work success? The model presented in this dissertation was developed in order to help better understand the antecedents to work success which could assist with a variety of business applications. The data that were collected for hypothesis testing lend some support to the model.

After data collection and analysis, these questions can now be answered. Partial support was provided to show that organizational justice and employee's virtual status did moderate the relationship between technology use and organizational identification. Organizational justice was also found to be a significant predictor of work success.

Employee's virtual status was a moderator for the relationship between need for affiliation and organizational identification while organizational justice was not found to be a significant moderator for the relationship between need for affiliation and organizational identification. Lastly, organizational identification and organizational justice were useful predictors of work success. Employee's virtual status was not found to be a significant predictor of work success.

The statistical analyses began by testing the first two hypotheses looking at the constructs influencing organizational identification. Both communication technology usage (H1a was partially supported) and need for affiliation (H1b) influenced organizational identification. These results indicate that the more technology made available to the employee, the more the employee will feel connected to the organization. Of the various types of technology, only mobile technology provided a significant impact on organizational identification. Understandably, an employee who can connect to his/ her organization, either physically or virtually through technology, would relate more to that organization, thus internalizing the organization into his or her identity. Need for affiliation and organizational identification should also be linked and was validated with this research. If a person has a high need for affiliation, he or she would need to feel a part of the organization and internalize the relationship. Both of these hypotheses were validated in this research.

The next hypotheses tested looked at the employee's virtual status as exerting a moderating role for the relationships between communication technology usage and organizational identification (H2a) and need for affiliation and organizational identification (H2b). The results showed that employee's virtual status did partially

moderate the relationship between technology usage and organizational identification (only new and older technologies were found to be significant predictors). This would indicate that employees who telecommute would use technology to increase their connection/relationship with their organizations. Employee's virtual status was hypothesized to moderate the relationship between need for affiliation and organizational identification (H2b). This hypothesis is supported in this research. This seems to be an intuitive relationship since an employee who has a high need for affiliation would not feel connected to an organization if he or she were working remotely and therefore disconnected from the organization. An employee's virtual status was also tested as a predictor to work success (H5). The analysis did not support employee's virtual status as a predictor of employee work success.

Somewhat stronger relationships were found with organizational justice. The hypotheses considering organizational justice as a moderator (H3a) and predictor to work success (H6) were supported. These results show that how the organization treats its employees is a most critical success factor regardless of the employee's virtual status. However, organizational justice was not found to moderate the relationship between need for affiliation and organizational identification (H3b). While the results were positive, they were not significant.

The remaining relationship tested was the positive impact organizational identification has on work success. This relationship was found to be significant in the hypothesized direction (H4). This finding indicates that as an employee feels more as being a part of the organization or conversely as an employee views the organization as a part of his or herself, work success increases.

The research presented in this dissertation is a solid foundation to explain how communication mediated technology and employees' need to feel connected to the organization (both through organizational identification and need for affiliation) are related. As technology trends continue to support increased mobility, working remotely will become more and more common. It would be, therefore, advantageous to refine and expand this research framework in order to better understand the antecedents to work success.

Contributions

All research should serve a purpose; usually that purpose is to expand the research base or knowledge in a particular area. This dissertation brings contributions to both business practices and IS research. Technology is continuing to advance meaning it will be easier and easier to telecommute. These advances also open new opportunities for research. Also, working remotely is projected to continue growing (www.bls.gov) and employers will need to adapt to the way their employees choose them to work.

The inclusion of organizational justice has been previously limited in telecommuting research. Additionally, the model showed that organizational identification and need for affiliation should also be considered as factors influencing work success. Prior research both in telecommuting and information systems has not considered these relationships in such depth, or breadth.

Next, this dissertation brought in the construct on technology usage to IS research. Technology has been changing so rapidly that research has lagged behind the available technologies and their impact. Through factor analysis, this study shows that when it comes to communication technology usage, the studied 22 devices were divided into four

different types based on their age/usage rate. The four types of technology are: office technology, mobile technology, new technology, and older technology. For example, email (office technology) loaded on a different factor than tablet computers (mobile technology). Collaborative software (new technology) loaded on a third factor different from Wikis (older technology). This revelation could serve as a foundation for several studies to view the impact of various technologies on many work related outcomes, regardless of employee's virtual status and provides a glimpse into how workers are using communication technologies at present.

For industry, this dissertation presents several findings of interest. The first is that organizational justice is a major factor for work success. Employers should focus on maximizing fairness in the workplace as this will increase work outcomes including productivity, performance and satisfaction, as well as the employee's perceived career prospects.

By understanding that organizational identification and need for affiliation are contributing attributes to work success, employers can encourage greater connectivity to employees who work remotely. Adding team building retreats, frequent face-to-face meetings, company materials (T-shirts, hats, etc.) could be easy ways to increase organizational identification.

Lastly, employers can see that technology usage can play a factor in work success. This revelation can help companies decide which technologies to provide to their employees. Also, companies can see that they should make mobile communication technologies available for remote workers in order for those employees to feel more connected, thus enhancing organizational identification.

On practical grounds, the dissertation attempts to provide answers to the following query: How does the communication technology usage portfolio of telecommuters differ from that of their non-telecommuting counterparts? For that matter, Table 14 reveals that on average, employees of low telecommuting intensity use the devices associated with office technology significantly larger than their high telecommuting intensity counterparts, while employees of low telecommuting intensity use the devices associated with the mobile technology significantly smaller than their high telecommuting intensity counterparts. Employees of low telecommuting intensity on average, use the devices associated with new and older technologies not significantly different from their high telecommuting intensity counterparts.

Additionally, the percentage of respondents using each type of technology was calculated (Table 15). This information can be very useful to both industry and information systems research as it enables knowing which technologies are currently being used in businesses and by whom. The usage percentage of employees of high telecommuting intensity (telecommuters) is significantly larger than their counterparts of low telecommuting counterparts (non-telecommuters) for the following seven devices: Tablet, Laptop, Smart Phone, GPS, Text Messaging, Social Media and Virtual Reality (all devices belonging to Mobil Technologies, in addition to Virtual Reality device that belongs to Older Technologies). However, the usage percentage of employees of high telecommuting intensity (telecommuters) is significantly smaller than their non-telecommuting counterparts for the following five devices: Desktop, Printer, Fax, Internet and Email (all devices belonging to Office Technologies, except for the Telephone). No significant difference in the usage percentage between the two groups has been detected

for the following devices: Phone, Instant Messaging, Digital Signatures, VPN, Teleconferences, Chat Rooms, Message Boards, Wikis, Collaborative Software, and Cloud Computing (mostly devices that belong to both new and older technologies).

These results are very useful for managers to be able to determine which types of technologies to provide to their workers. Understanding this usage could lead to higher productivity and lower technology costs. For example, a manager could decrease his IT budget by mostly purchasing tablet computers for his/ her telecommuting staff.

Limitations

Using a data collection company such as Qualtrics or Survey Monkey, brings certain limitations for the sample. For starters, the panel is self-selecting, meaning that the sample is not a true random sample of the population. Rather, the sample is a random panel of persons who have joined the survey pool. Additionally, no parameters were placed on the participants regarding industry, region or job level. Some effects that were job specific (i.e., sales) might not have been fully realized. However, the method of data collection was specifically intended to avoid traditional college students (ages 18-22) enrolled in universities, as they have been the focus of many online research (Posey, et al., 2010). Second, panels allow anonymity to be guaranteed for the respondents. Third, participants belong to a wide range of industries and positions that would be very difficult to attain by traditional data collection methods. Notably, panels have been used to elicit responses to survey instruments in a variety of IS contexts (e.g., Posey, et al., 2010; Awad and Ragowsky, 2008).

Next, the usage of self-reporting constructs, such as work success, might bias the responses of employees. To address the possibility of occurrence of pattern response bias,

a portion of the survey items were reverse worded to keep the subjects alert and engaged with the items and to limit a subject's tendency to respond to the items with similar responses (Churchill, 1983). By including an employee's supervisor input for those survey items, a more balanced view of the issues being considered might be presented.

Third, other limitations include the fact that the collected data represents a 'snapshot' of one point in time. Therefore, potential two-way directional relationships between constructs cannot be disclosed. For example, organizational identification affects work success and that in turn can positively affect organizational identification.

Future Research

While this exploratory research aims at understanding the antecedents to work success, more research is needed in the future. Future studies will need to retest the model presented in this dissertation to substantiate the scrutinized relationships. Additional constructs/variables could also be included as potential antecedents and moderators/mediators. Firstly, self-motivation could be included as an antecedent construct. An employee's ability to self-start and work independently of supervision and employee's sense of obligation to the firm of employment would seemingly affect work success. Secondly, organizational commitment could be included, as a mediator between organizational identification and work success. Thirdly, gender and organizational/job tenure could be examined as moderators for the relationship between organizational identification and work success.

An additional direction for the future research would be to look at students instead of employees. The same revolutionary advances in technology that make for more and easier telecommunications for employment apply to education. Like employees are able

to work from many nontraditional locations and nontraditional working hours, students can now do the same with their education. Finding if the same antecedents apply to students as employees would be an interesting area of research. Additionally, looking at the differences between traditional students' and online students' success would be particularly interesting to universities and other school systems looking to expand their curriculum.

The results of this research effort are applicable to the communication technology devices and the measures of work success currently being used. Adding further communication technologies to the studied list of devices and enlarging the scope of work success measures would yield interesting avenues for future research.

APPENDIX A

SURVEY INSTRUMENT

Telecommuting Intensity

How many hours do you work per week (count only the number of hours worked during normal office hours)?

How many hours per week do you work from home or a remote office?

How many hours per week do you work from a traditional office setting?

How many hours per week do you work from a hotel, your car, or some other mobile environment (coffee shop, restaurant, gym, etc.)?

Is telecommuting required for your job (i.e. sales)?

To your knowledge, does your company have a formal telecommuting policy?

Technology Usage
Adapted from (Baker, et al. 2006)

	How much do you use each of these products for your job?	Not at all	Infrequently	Somewhat Infrequently	Occasionally	Somewhat Infrequently	Frequently	Daily
1	Tablet Computer (ex. iPad)	1	2	3	4	5	6	7
2	Laptop Computer	1	2	3	4	5	6	7
3	Personal Computer (Desktop Computer)	1	2	3	4	5	6	7
4	Printer	1	2	3	4	5	6	7
5	Fax Machine	1	2	3	4	5	6	7
6	Telephone (Landline)	1	2	3	4	5	6	7
7	Smartphone/Mobile phone	1	2	3	4	5	6	7
8	Internet	1	2	3	4	5	6	7
9	Global Positioning System (GPS)	1	2	3	4	5	6	7
10	Email	1	2	3	4	5	6	7
11	Text Messaging	1	2	3	4	5	6	7
12	Instant Messaging Programs	1	2	3	4	5	6	7
13	Digital Signatures	1	2	3	4	5	6	7
14	Social Media (Facebook, Twitter, LinkedIn, etc.)	1	2	3	4	5	6	7
15	Virtual Private Network (VPN)	1	2	3	4	5	6	7
16	Video Conferencing (including FaceTime or Skype)	1	2	3	4	5	6	7
17	Internet Chat Rooms	1	2	3	4	5	6	7
18	Internet Message Boards	1	2	3	4	5	6	7
19	Wikis	1	2	3	4	5	6	7
20	Collaborative software (including Lotus Notes, Google Docs, Dropbox, MS SharePoint, or similar)	1	2	3	4	5	6	7
21	Cloud computing	1	2	3	4	5	6	7
22	Virtual Reality	1	2	3	4	5	6	7

Organizational Justice
(Ambrose and Schminke, 2009)

		Disagree Completely	Strongly Disagree	Disagree	Neither Agree nor disagree	Agree	Strongly Agree	Agree Completely
	The following items refer to the procedures used by your organization to arrive at your firm's telecommuting procedures. To what extent:							
1	Overall, I'm treated fairly by my organization.	1 2 3 4 5 6 7						
2	In general, I can count on this organization to be fair.	1 2 3 4 5 6 7						
3	In general, the treatment I receive around here is fair.	1 2 3 4 5 6 7						
4	Usually, the way things work in this organization are not fair.	1 2 3 4 5 6 7						
5	For the most part, this organization treats its employees fairly	1 2 3 4 5 6 7						
6	Most of the people who work here would say they are often treated unfairly. (R)	1 2 3 4 5 6 7						

Organizational Identification
(Mael and Ashforth, 1992)

		Disagree Completely	Strongly Disagree	Disagree	Neither Agree nor disagree	Agree	Strongly Agree	Agree Completely
	In the following questions, please think about the company/firm by which you are employed.							
1	When someone criticizes the company, it feels like a personal insult.	1	2	3	4	5	6	7
2	I am very interested in what others think about the company.	1	2	3	4	5	6	7
3	When I talk about the company, I usually say 'we' rather than 'they'.	1	2	3	4	5	6	7
4	This company's successes are my successes.	1	2	3	4	5	6	7
5	When someone praises this company, it feels like a personal compliment.	1	2	3	4	5	6	7
6	If a story in the media criticized the company, I would feel embarrassed.	1	2	3	4	5	6	7

Work Success
(Neufeld and Fang, 2005; Bélanger et al., 2001; and McCloskey, 2010)

		Disagree Completely	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Agree Completely
	Productivity							
1	I am very productive while telecommuting.	1	2	3	4	5	6	7
2	My work environment allows me to work efficiently.	1	2	3	4	5	6	7
3	I feel I am not productive in my work environment.	1	2	3	4	5	6	7
4	My work environment allows me to complete a large number of tasks each day.	1	2	3	4	5	6	7
	Performance							
5	My work environment allows me to meet the expectations of my supervisor in performing my job.	1	2	3	4	5	6	7
6	My work environment allows me to do high quality work.	1	2	3	4	5	6	7
7	My work environment allows me to complete tasks in an unsatisfactory manner.	1	2	3	4	5	6	7
8	My work environment allows me to complete work in a timely and effective manner.	1	2	3	4	5	6	7
9	My work environment allows me to improve my overall work performance.	1	2	3	4	5	6	7
	Satisfaction							
10	I am satisfied with my work environment.	1	2	3	4	5	6	7
11	My work environment allows me to get help from coworkers when needed.	1	2	3	4	5	6	7
12	My work environment allows me to get help from my supervisor when needed.	1	2	3	4	5	6	7
13	My work environment allows me to feel as if I belong to an office team.	1	2	3	4	5	6	7
	Career Prospects							
14	The likelihood of being promoted within the current organization is high.	1	2	3	4	5	6	7

Need for Affiliation
(Baker, 1979; Jackson, 1984; and Hill, 1987)

		Disagree Completely	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Agree Completely
1	I enjoy being with friends and people in general.	1 2 3 4 5 6 7						
2	I have the greatest need to have other people around me when I am upset about something.	1 2 3 4 5 6 7						
3	I am always on the lookout for more friends.	1 2 3 4 5 6 7						
4	I usually like to be around people who think I am an important person.	1 2 3 4 5 6 7						
5	I prefer to participate in activities alongside other people rather than myself.	1 2 3 4 5 6 7						
6	When I am around people, I have a strong desire to get them to notice and appreciate me.	1 2 3 4 5 6 7						
7	I sometimes worry about whether people like me or not.	1 2 3 4 5 6 7						
8	Observing people and seeing what they are like is one of the most enjoyable things I can think of doing.	1 2 3 4 5 6 7						
9	I find that I look to other people to see how I compare to them.	1 2 3 4 5 6 7						
10	I often have the desire to be around other people who are experiencing the same thing I am.	1 2 3 4 5 6 7						

Demographic Data

Gender: Male   Female

Marital status: Married/Domestic Partnership   Single

How many dependents do you have in your household? (Dropdown)

What is the highest level of education you have completed? (Dropdown)

> High School Graduate or GED ii.
>
> Technical or Community College Graduate or Associate's Degree iii. Bachelor's
>
> Degree
>
> Master's Degree
>
> Doctoral Degree

Organizational tenure (years)

Industry (Dropdown):

> Accounting/Auditing
>
> Administration
>
> Advertising/Marketing
>
> Analyst
>
> Art/Creative/Design
>
> Business Development
>
> Consulting
>
> Construction
>
> Customer Service
>
> Distribution
>
> Doctor
>
> Educator (e.g. teacher, lecturer, professor)
>
> Engineering
>
> Finance
>
> General Business
>
> Healthcare Provider (other than doctor or nurse)
>
> Human Resources

Information Technology

Legal

Management

Manufacturing

Nurse

Production

Production Management

Project Management

Public Relations

Purchasing

Quality Assurance

Research

Sales

Science

Strategy/Planning

Supply Chain

Training

APPENDIX B

HUMAN USE APPROVAL LETTER

LOUISIANA TECH
U N I V E R S I T Y

MEMORANDUM
OFFICE OF UNIVERSITY RESEARCH

TO: Ms. Julia Graham and Dr. Selwyn Ellis

FROM: Dr. Stan Napper, Vice President Research & Development

SUBJECT: HUMAN USE COMMITTEE REVIEW

DATE: November 26, 2014

In order to facilitate your project, an EXPEDITED REVIEW has been done for your proposed study entitled:

**"CIS Dissertation- "An Empirical Investigation into the
Antecedents of Telecommuting Success"**

HUC 1247

The proposed study's revised procedures were found to provide reasonable and adequate safeguards against possible risks involving human subjects. The information to be collected may be personal in nature or implication. Therefore, diligent care needs to be taken to protect the privacy of the participants and to assure that the data are kept confidential. Informed consent is a critical part of the research process. The subjects must be informed that their participation is voluntary. It is important that consent materials be presented in a language understandable to every participant. If you have participants in your study whose first language is not English, be sure that informed consent materials are adequately explained or translated. Since your reviewed project appears to do no damage to the participants, the Human Use Committee grants approval of the involvement of human subjects as outlined.

Projects should be renewed annually. *This approval was finalized on November 26, 2014 and this project will need to receive a continuation review by the IRB if the project, including data analysis, continues beyond November 26, 2015.* Any discrepancies in procedure or changes that have been made including approved changes should be noted in the review application. Projects involving NIH funds require annual education training to be documented. For more information regarding this, contact the Office of University Research.

You are requested to maintain written records of your procedures, data collected, and subjects involved. These records will need to be available upon request during the conduct of the study and retained by the university for three years after the conclusion of the study. If changes occur in recruiting of subjects, informed consent process or in your research protocol, or if unanticipated problems should arise it is the Researchers responsibility to notify the Office of Research or IRB in writing. The project should be discontinued until modifications can be reviewed and approved.

If you have any questions, please contact Dr. Mary Livingston at 257-2292 or 257-5066.

APPENDIX C

CORRELATION MATRIX OF CONTINUOUS VARIABLES

Correlation Matrix of Continuous Variables

		OrgId	WorkSuc	Age	Tenure	Dependents	OffTech	MobiTech	OldTech	NewTech	NeedAff	OrgJust
OrgId	Pearson Correlation	1	.688**	-.170**	-.014	.116	.158*	.357**	.291**	.245**	.384**	.681**
	Sig. (2-tailed)		.000	.006	.826	.060	.010	.000	.000	.000	.000	.000
	N	263	263	263	263	263	263	263	263	263	263	263
WorkSuc	Pearson Correlation	.688**	1	-.211**	-.078	.112	.125*	.314**	.276**	.288**	.250**	.746**
	Sig. (2-tailed)	.000		.001	.208	.071	.043	.000	.000	.000	.000	.000
	N	263	263	263	263	263	263	263	263	263	263	263
Age	Pearson Correlation	-.170**	-.211**	1	.493**	.050	-.002	-.126*	-.223**	-.219**	-.272**	-.187**
	Sig. (2-tailed)	.006	.001		.000	.424	.971	.041	.000	.000	.000	.002
	N	263	263	263	263	263	263	263	263	263	263	263
Tenure	Pearson Correlation	-.014	-.078	.493**	1	.067	.046	.012	-.029	-.028	-.112	-.077
	Sig. (2-tailed)	.826	.208	.000		.276	.456	.847	.635	.655	.070	.216
	N	263	263	263	263	263	263	263	263	263	263	263
Dependents	Pearson Correlation	.116	.112	.050	.067	1	.129*	.182**	.105	.110	.071	.073
	Sig. (2-tailed)	.060	.071	.424	.276		.037	.003	.090	.075	.254	.241
	N	263	263	263	263	263	263	263	263	263	263	263
OffTech	Pearson Correlation	.158*	.125*	-.002	.046	.129*	1	.306**	.243**	.369**	.163**	.123*
	Sig. (2-tailed)	.010	.043	.971	.456	.037		.000	.000	.000	.008	.046
	N	263	263	263	263	263	263	263	263	263	263	263
MobiTech	Pearson Correlation	.357**	.314**	-.126*	.012	.182**	.306**	1	.614**	.662**	.326**	.324**
	Sig. (2-tailed)	.000	.000	.041	.847	.003	.000		.000	.000	.000	.000
	N	263	263	263	263	263	263	263	263	263	263	263
OldTech	Pearson Correlation	.291**	.276**	-.223**	-.029	.105	.243**	.614**	1	.703**	.428**	.234**
	Sig. (2-tailed)	.000	.000	.000	.635	.090	.000	.000		.000	.000	.000
	N	263	263	263	263	263	263	263	263	263	263	263

NewTech	Pearson Correlation	.245**	.288**	-.219**	-.028	.110	.369**	.662**	.703**	1	.360**	.237**
	Sig. (2-tailed)	.000	.000	.000	.655	.075	.000	.000	.000		.000	.000
	N	263	263	263	263	263	263	263	263	263	263	263
NeedAff	Pearson Correlation	.384**	.250**	-.272**	-.112	.071	.163**	.326**	.428**	.360**	1	.238**
	Sig. (2-tailed)	.000	.000	.000	.070	.254	.008	.000	.000	.000		.000
	N	263	263	263	263	263	263	263	263	263	263	263
OrgJust	Pearson Correlation	.681**	.746**	-.187**	-.077	.073	.123*	.324**	.234**	.237**	.238**	1
	Sig. (2-tailed)	.000	.000	.002	.216	.241	.046	.000	.000	.000	.000	
	N	263	263	263	263	263	263	263	263	263	263	263

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX D

ON OUTLIERS' DETECTION AND MODEL DIAGNOSTICS

On Outliers' Detection and Model Diagnostics

The contents of this Appendix rely heavily on material included in Kutner, et al., (2005) and Hair, et al., (2010). The Appendix includes the research findings related to outliers' detection and diagnostics related to assumptions pertaining to two main multiple-regression models estimated in the dissertation.

Identifying X Outliers

Leverage values (diagonal elements of the Hat Matrix) measure how far an observation is from others in terms of the levels of the independent variables. Leverages fall between zero and one. An observation of a leverage value h_{ii} greater than two (p/n), where p is the number of regression parameters and n is the number of observations, is suggested to be an outlier.

For Model 6 estimated in Table 8, p = 26 and n = 263 so that 2 (p/n) = 2 (26/ 263) = 0.1977 which is larger than h_{ii} for i = 1, 2, 3, ..., 263 obtained from SPSS computer printouts. It is thus concluded that for that model there is no outlying X observations.

For Model 1 estimated in Table 10, p = 14 and n = 263 so that 2 (p/n) = 2 (14/263) = 0.1065 which is larger than h_{ii} for i = 1, 2, 3, ..., 263 obtained from SPSS computer printouts. It is thus concluded that for that model there is no outlying X observations as well.

Identifying Y Outliers

Outlying Y observations are those cases whose studentized deleted residuals are large in absolute value. In addition, one can conduct a formal test by means of the Bonferroni test procedure of whether the case with the largest absolute standardized deleted residual t_i is an outlier. Since one does not know in advance which case will have the largest absolute value $|t_i|$, one considers the family of tests to include n tests, one for each case. If the regression model is appropriate, so that no case is outlying because of a change in the model, then each studentized deleted residual will follow the t distribution with $n - p - 1$ degrees of freedom. The appropriate Bonferroni critical value therefore is $t_{\alpha/2n \,;\, n-p-1}$. Note that the test is two-sided since one is not concerned with the direction of the residuals, but only with their absolute values.

For Model 6 estimated in Table 9 and for $\alpha = 0.10$, $t_{\alpha/2n \,;\, n-p-1} = t_{\,0.00019 \,;\, 238} = 3.605$ which is larger than $|t_i|$ for $i = 1, 2, 3, \ldots, 263$ obtained from SPSS computer printouts. It is concluded, therefore, that for that model there is no outlying Y observations.

For Model 1 estimated in Table 10 and for $\alpha = 0.10$, $t_{\alpha/2n \,;\, n-p-1} = t_{\,0.00019 \,;\, 250} = 3.603$ which is larger than $|t_i|$ for $i = 1, 2, 3, \ldots, 263$ obtained from SPSS computer printouts. It is concluded, therefore, that for that model there is no outlying Y observations also.

Measure of Aggregate Influence – Cook's Distance

Cook's D is a measure for the aggregate impact of each observation on the group of regression coefficients, as well as the group of fitted values. It has been found useful to relate D_i to the $F(p, n-p)$ distribution and ascertain the corresponding percentile value. If
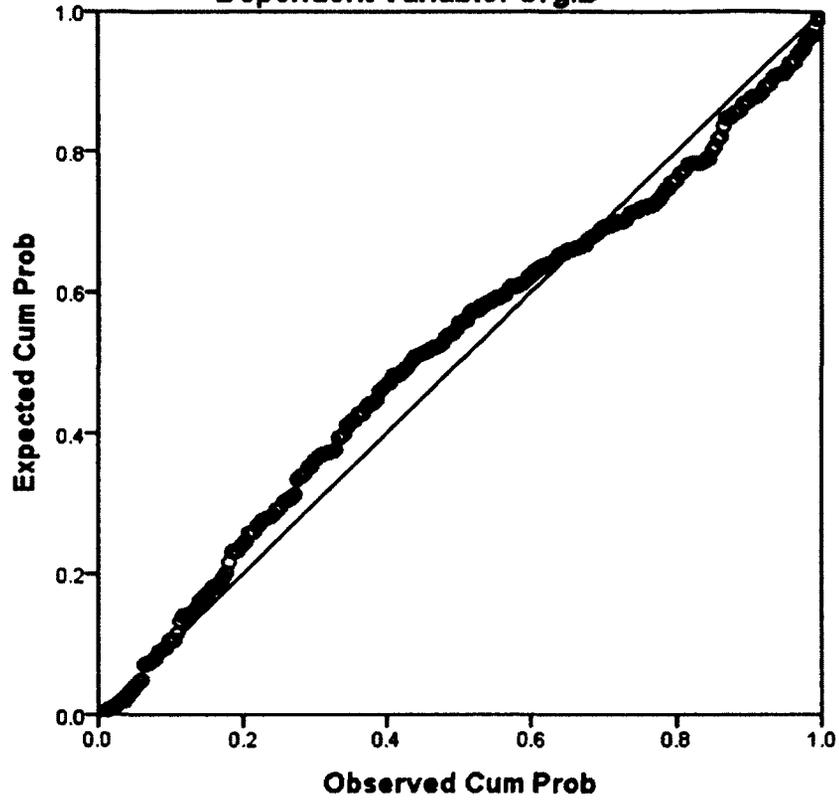
the percentile value is less than about 10 or 20 percent, the ith case has little apparent influence on the regression coefficients or the fitted values.
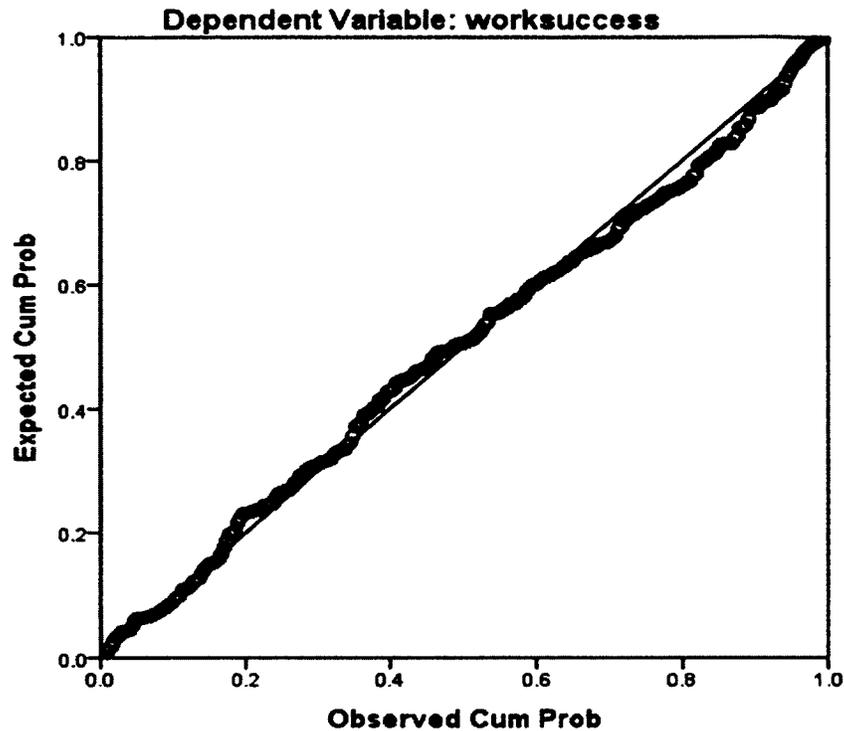
For Model 6 estimated in Table 9, the maximum D_i is related to case 67 and has the value of 0.07547. This value corresponds to less than the tenth percentile of the $F_{26, 239}$ distribution. It is thus concluded that Model 6 has negligible influence on the regression coefficients or the fitted values. For Model 1 estimated in Table 10, the maximum D_i is related to case 48 and has the value of 0.04775. This value corresponds to less than the tenth percentile of the $F_{14, 251}$ distribution. It is thus concluded that Model 1 has negligible influence on the regression coefficients or the fitted values.

Normality of the Error Term Distribution

Normality of the error terms can be assessed graphically through comparing the standardized residuals with the normal distribution. The normal distribution makes a straight diagonal line, and the plotted residuals are compared with the diagonal. Normal probability plots obtained using SPSS reveal that the standardized residuals pertaining to Model 6 estimated in Table 9 together with Model 1 estimated in Table 10 do not violate the normality assumption.

Normal Plot of Standardized Residuals - Model 6 (Table 8)

**Normal Plot of Standardized Residuals - Model 1 (Table 9)**
Dependent Variable: worksuccess

Constant Variance of the Error Term Distribution

The presence of unequal variances (hetroscedasticity) is one of the most common assumption violations. Plotting the residuals (studentized) against the predicted dependent values (standardized) would show a consistent pattern if the variance is not constant. Related plots obtained using SPSS reveal that the residuals pertaining to Model 6 estimated in Table 8 and the residuals related to Model 1 estimated in Table 9 do not violate the assumption of constant variance (homoscedasticity).

Analysis of Studentized Residuals - Model 6 (Table 8)
Dependent Variable: OrgID

Analysis of Studentized Residuals - Model 1 (Table 9)

Dependent Variable: worksuccess
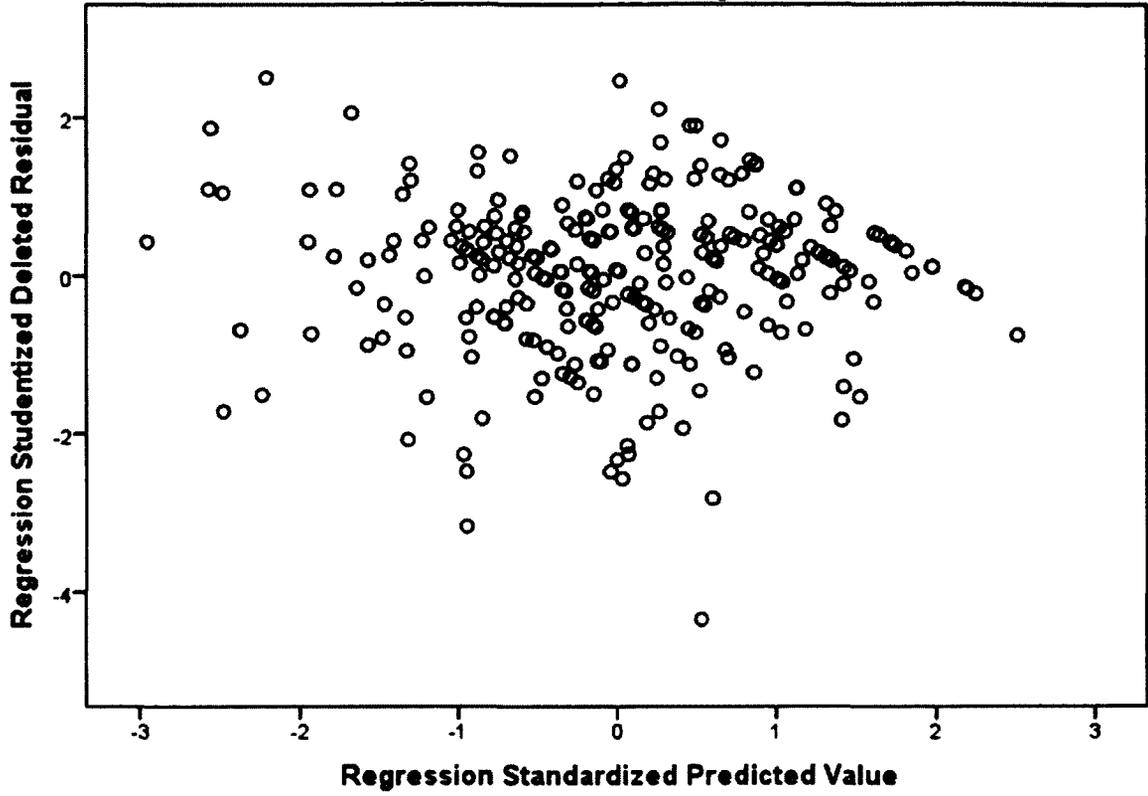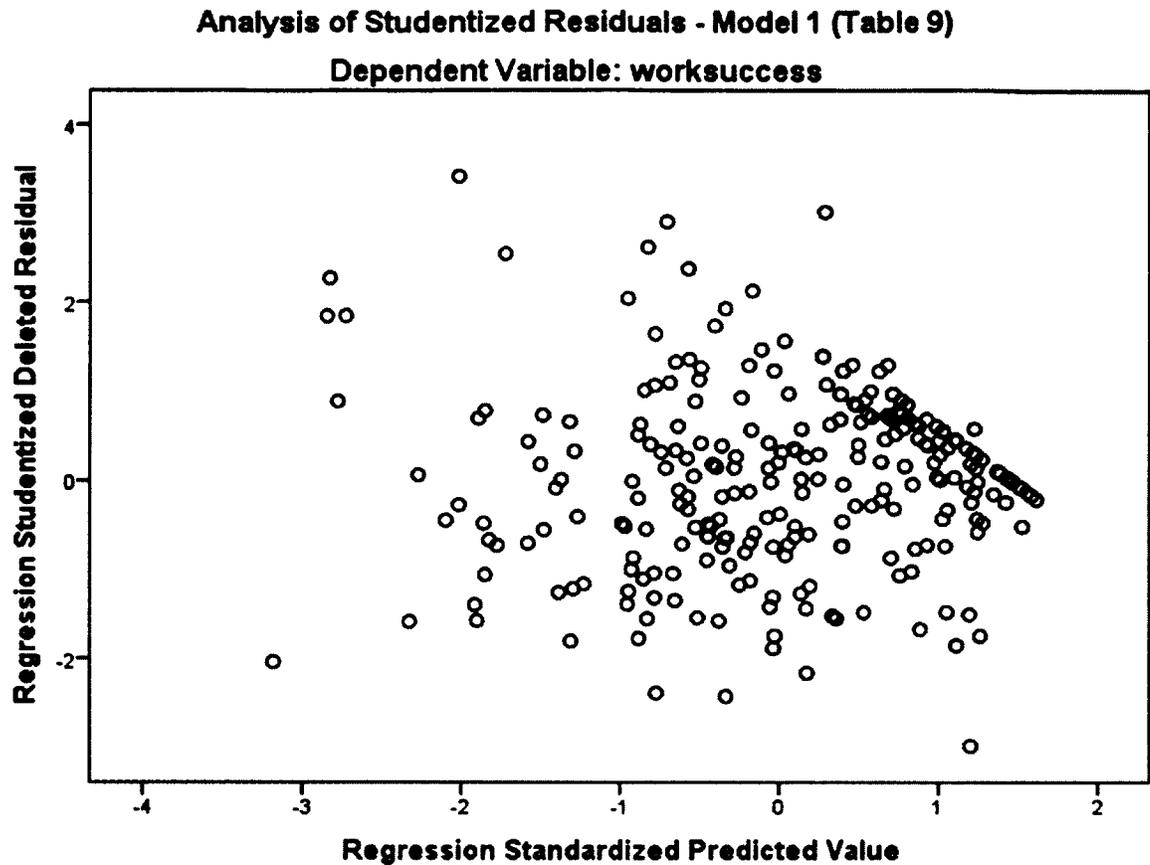
Independence of Predictor Variables

The Variance Inflation Factor (VIF) measures how highly correlated each independent variable is with the other predictors in the model. Values larger than 10 for a predictor imply large inflated standard errors of regression coefficients due to this variable being in the model (multicollinearity). Since the maximum VIF related to Model 6 estimated in Table 9 is 6.237 whereas it is 2.032 for Model 1 estimated in Table 10, it is concluded that multicollinearity is of no concern for these two models.

REFERENCES

Abrams, D., Ando, K., and Hinkle, S. 1998. "Psychological Attachment to the Group," *Personality and Social Psychology Bulletin* (24), pp. 1027-1039.

Adams, S. J. 1963. "Towards an Understanding of Inequity," *The Journal of Abnormal and Social Psychology*, (67:5), November, pp. 422-436.

Adams, J.S. 1965. "Inequity in Social Exchange," In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (2), pp. 267-299). New York: Academic Press.

Aiken, L. S., and West, S. G. 1991. *Multiple Regression*. Beverly Hills: Sage Publishing.

Al-Zu'bi, H. A. 2010. "A Study of Relationship between Organizational Justice and Job Satisfaction," *International Journal of Business and Management, (5:12)*, December, pp. 102-109.

Ambrose, M. L., and Arnuad, A. 2005. "Distributive and Procedural Justice: Construct Distinctiveness, Construct Interdependence and Overall Justice," In J. Greenberg and J. Colquitte (Eds.), *The Handbook of Organizational Justice*, pp. 59-84, Mahwah, NJ:Erlbaum.

Ambrose, M. L., and Schminke, M. 2009. "The Role of Overall Justice Judgments in Organizational Justice Research: a Test of Mediation," *Journal of Applied Psychology*, (94: 2), 491.

Arthur, M., and Cook, A. 2003. "The Relationships between Work-Family Human Resource Practices and Firm Profitability: A Multitheoretical Perspective," *Research in Personnel and Human Resources Management*, (22), pp. 219-252.

Ashforth, B. E., and Mael, F. 1989. "Social Identity and the Organization," *Academy of Management Review*, (14), pp. 20-39.

Awad, N.F., and Ragowsky, A. 2008. "Establishing Trust in Electronic Commerce Through Online Word of Mouth: An Examination Across Genders," *Journal of Management Information Systems*, 24 (4), pp.101-121.

Baltes, P. B., Staudinger, U. M., and Lindenberger, U. 1999. "Lifespan Psychology: Theory and Application to Intellectual Functioning. *Annual Review of Psychology*, (50: 1), pp. 471-507.

Baker, C.R.1979. "Defining and Measuring Affiliation Motivation," European Journal of Social Psychology, (9), pp. 97-99.

Baker, E., Avery, G. C., and Crawford, J. 2006. "Home Alone: The Role of Technology in Telecommuting," *Information Resources Management Journal (IRMJ)*, (19:4), pp. 1-22.

Barker, J.R., and Thompkins, P.K. 1994. "Identification in the Self-Managing Organization," *Human Communications Research*, (21), pp. 223-240.

Baron, R., and Kenny, D. 1986. "The Moderator-Mediator Variable Distinction in Social Psychological Research:Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology*, (51: 6), pp. 1173-1182.

Barreto, M., and Ellemers, N. 2000. "You Can't Always Do What You Want: Social identity and the Self-Presentational Determinants of the Choice to Work for a Low-Status Group," *Personality and Social Psychology Bulletin*, (26), pp. 891-906.

Barrett, M. I., and Walsham, G. 1999. "Electronic Trading and Work Transformation in the London Insurance Market," *Information Systems Research*, (10:1), pp. 1-22.

Baruch, Y. 2000. "Teleworking: Benefits and Pitfalls as Perceived by Professionals and Managers," *New Technology, Work and Employment*, (15: 1), pp. 34-49.

Bélanger, F., and Collins, R.W. 1998. "Distributed Work Arrangement: A Research Framework," *The Information Society*, (14: 2), pp. 137-152.

Bélanger, F., Collins, R.W., and Cheney, P.H. 2001. "Technology Requirements and Work Group Communication for Telecommuters," *Information Systems Research*, (12: 2), pp. 155-176.

Benbasat, I., Gefen, D., and Pavlou, P. A. 2008. "Special Issue: Trust in Online Environments," *Journal of Management Information Systems* (24:4) Spring, pp. 5-11.

Bergami, M., and Bagozzi, R. P. 2000. "Self-Categorization, Affective Commitment and Group Self-Esteem as Distinct Predictors of social Identity in the Organization," *British Journal of Social Psychology*, (39), pp. 555-577.

Brown, C. V., DeHayes, D. W., Hoffer, J. A., Martin, W. E., and Perkins, W. C. 2011. *Managing Information Technology 7th Edition*. Pearson Prentice Hall, Upper Saddle River, NJ.

Cheney, G. 1983. "On the Various and Changing Meanings of Organizational Membership: A Field Study of Organizational Identification," *Communication Monographs*, (50), pp. 343-362.

Chiu, C. M., Lin, H. Y., Sun, S. Y., and Hsu, M. H. 2009. "Understanding Customers' Loyalty Intentions towards Online Shopping: An Integration of Technology Acceptance Model and Fairness Theory," *Behaviour & Information Technology* (28:4), July-August, pp. 347-360.

Churchill, G. 1983. *Marketing Research: Methodological Foundations*. The Dryden Press, New York, NY.

Cohen, J. 1977. *Statistical power analysis for the Behavioural Sciences* (Rev. ed.), New York Academic Press, New York.

Cohen, A. 1992. "Age and Tenure in Relation to Organizational Commitment: A Meta-Analysis," *Basic and Applied Social Psychology*, (14), pp. 143-159.

Cohen-Charash, Y., and Spector, P.E. 2001. "The Role of Justice in Organizations: The Role of Justice in Organizations: A Meta-Analysis," *Organizational Behavior and Human Decision Processes*, (86:2), November, pp. 278-321.

Constant, D., Kiesler, S., and Sproull, L.1994. "What's Mine Is Ours, or Is It? A Study of Attitudes about Information Sharing," *Information Systems Research*, (5:4), pp. 400-421.

Cronbach, L. 1951. "Coefficient Alpha and the Industrial Structure of Test," *Psychometrica* (16), pp. 297-334.

Colquitt, J. A. 2001. "On the Dimensionality of Organizational Justice: A Construct Validation of Measure," *Journal of Applied Psychology*, (86:3), June, pp. 386-400.

Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O. L. H., and Ng, K. Y. 2001. "Justice at the Millennium: A Meta-Analytic Review of 25 Years of Organizational Justice Research," *Journal of Applied Psychology*, (86:3), June, pp. 425-445.

Cooper, C., and Kurland, N. B. 2002. "Telecommuting, Professional Isolation and Employee Development in Public and Private Organizations," *Journal of Organizational Behavior*, (23:4), June, pp. 511-532.

Culnan, M. J., and Armstrong, P. K. 1999. "Information Privacy Concerns, Procedural Fairness, and Impersonal Trust: An Empirical Investigation," *Organization Science* (10:1) January-February, pp. 104-115.

Daft, R.L., and Lengel, R.H. 1986. "Organizational Information Requirements, Media Richness and Structural Design," *Management Science* (32:5), pp. 554-571.

Davis C.J., and Hufnagel, E.M. 2007. "Through the Eyes of Experts: A Socio-Cognitive Perspective on the Automation of Fingerprint Work," *MIS Quarterly,* (31:4), pp. 681-704.

Deci, E.L., and Ryan, R. M. 2002. "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being," *American Psychologist,* (55:1), January, pp. 68–78.

DeSanctis, G. 1984. "Attitudes toward Telecommuting: Implications for Work-at-Home Programs," *Information and Management,* (7:3), June, pp. 133-139.

DiMartino, V., and Wirth, L. 1990. "Telework: A New Way of Working and Living," *International Labour Review,* (129:5), pp. 529-554.

Dineen, B. R., Noe, R. A., and Wang, C. 2004. "Perceived Fairness of Web-Based Applicant Screening Procedures: Weighing the Rules of Justice and the Role of Individual Differences," *Human Resource Management,* (43:2-3), Fall, pp. 127-145.

Doolin, B. 2002. "Enterprise Discourse, Professional Identity and the Organizational Control of Hospital Clinicians," *Organization Studies.* (23:4), pp. 369-390.

Doolin, B. 2003. "Narratives of Change: Discourse, Technology and Organization," *Organization Studies.* (10:4), pp. 751-770.

Duxbury, L. E., Higgins, C. A., and Irving, R. H., 1987. "Attitudes of Managers and Employees to Telecommuting," *INFOR,* (25:3), pp. 273-285.

Ellis, T. S., and Webster, R. L. 1999. "Innovativeness of Information Systems Managers Toward Telecommuting: A Structural Equation Model", *Journal of Computer Information Systems,* (39:3), Spring pp. 3-12.

Elsbach, K.D. 1999. "An Expanded Model of Organizational Identification," *Research in Organizational Behavior,* (21), pp. 371-389.

Eveland, J. D., and Bikson, T. K. 1988. "Work Group Structures and Computer Support: A Field Experiment," *ACM Transactions on Information Systems (TOIS),* (6: 4), pp. 354-379.

Fonner, K. L., and Roloff, M. E. 2012. "Testing the Connectivity Paradox: Linking Teleworkers' Communication Media Use to Social Presence, Stress from Interruptions, and Organizational Identification," *Communication Monographs*, (79:2), pp. 205-231.

Fontenot, J., and Scott, C.R. 2003. "Toward a Communication-Centered Measure of Organizational Identification: Reconceptualization and Initial Scale Development of the C-OI," Conference Papers -- International Communication Association, 2003 Annual Meeting, San Diego, CA, pp. 1-33.

Freeman, R. B. 1980. "The Exit-Voice Tradeoff in the Labor Market: Unionism, Job Tenure, Quits, and Separations," *The Quarterly Journal of Economics*, (94:4), November, pp. 643-673.

Furneaux, B. 2012. "Task-Technology Fit Theory: A Survey and Synopsis of the Literature. In *Information Systems Theory*, Springer, New York, pp. 87-106.

Gajendran, R.S., and Harrison, D. A. 2007. "The Good, the Bad, and the Unknown about Telecommuting: Meta-Analysis of Psychological Mediators and Individual Consequences," *Journal of Applied Psychology*, (92:6), November, pp. 1524-1541.

Gal U., Lyytinen K., and Yoo, Y. 2008. "The Dynamics of IT Boundary Objects, Information Infrastructures, and Organizational Identities: The Introduction of 3D Modelling Technologies into the Architecture, Engineering, and Construction Industry," *European Journal of Information Systems*, (17:3), pp. 290-304.

Garfinkel, S.L. 1995. "Risks of Social Security Numbers," *Communications of the ACM*, (38:10), pp. 146.

Gefen, D. 2000. "E-Commerce: The Role of Familiarity and Trust," *Omega*, (28: 6), pp. 725-737.

Goodhue, D. L., and Thompson, R. L. 1995. "Task-Technology Fit and Individual Performance," *MIS Quarterly*, (19:2), June, pp. 213-236.

Greenberg, J. 1987. "A Taxonomy of Organizational Justice Theories," *Academy of Management Review*, (12:1), January, pp. 9–22.

Greenberg, J., and Colquitt, J.A. 2005. "What is Responsible for the Fair Process Effect," *Handbook of Organizational Justice*, (1), pp. 273-300.

Hair, J. F. Jr., Black, W. C, Babin, B. J., and Anderson, R. E. 2010. *Multivariate Data Analysis, 7th ed.* Pearson Prentice Hall, Upper Saddle River, NJ.

Hall, D.T., Schneider, B., and Nygren, H.T. 1970. "Personal Factors in Organizational Identification," *Administrative Science Quarterly*, (15), pp. 176-190.

Harrington, S. J., and Ruppel, C.P. 1999. "Practical and Value Compatibility: Their Roles in the Adoption, Diffusion and Success of Telecommuting," *Professional Communication, IEEE Transactions on* (42:4), pp. 223-239.

Haslam, S. A., and Knight, C. 2010. "Cubicle, Sweet Cubicle," *Scientific American Mind*, (21: 4), pp. 30-35.

He, W., Chen, C.C., and Zhang, L. 2004. "Rewards-Allocation Preferences of Chinese Employees in the New Millennium: The Effects of Ownership Reform, Collectivism, and Goal Priority," *Organizational Science*, (15:2), pp. 221-231.

Hemp, P. 2009. "Death by Information Overload," *Harvard Business Review*, (87:9), September, pp. 49-53.

Higa, K., Liu Sheng, O. R., Shin, B., and Figueredo, A. J. 2000. "Understanding Relationships Among Teleworkers' E-Mail Usage, E-Mail Richness Perceptions, and E-Mail Productivity Perceptions Under a Software Engineering Environment," *IEEE Transactions on Engineering Management*, (47:2), May, pp. 163-173.

Hill, C. A., 1987. "Affiliation Motivation: People Who Need People...But in Different Ways," *Journal of Personality and Social Psychology*, (53), pp. 1008-1018.

Huff, L., and Kelley, L. 2003. "Levels of Organizational Trust in Individualist Versus Collectivist Societies: A Seven-Nation Study," *Organization Science*, (14: 1), pp. 81-90.

Hunton J. 2005. "Behavioral Self-Regulation of Telework Locations: Interrupting Interruptions!," *Journal of Information Systems*, (19:2), Fall, pp. 111-140.

Jackson, D. N. 1984. *Personality research form manual.* Port Huron, Michigan: Research Psychologists Press.

Johnson, R. E., and Lord, R.G. 2010. "Implicit effects of justice on self-identity." *Journal of Applied Psychology.* (95:4) (2010), pp. 681.

Jones, C., and Volpe, E. H. 2011. "Organizational Identification: Extending Our Understanding of Social Identities through Social Networks," *Journal of Organizational Behavior*, (32: 3), pp. 413-434.

Joshi, K. 1989. "The Measurement of Fairness or Equity Perceptions of Management Information Systems Users," *MIS Quarterly.* (13:3), pp. 343-358.

Kavan, C. B., and Saunders, C. S. 1998. "Managers: A Key Ingredient to Alternative." *Journal of Organizational and End User Computing (JOEUC)*, (10:4), pp. 23-32.

Kiesler, C. A. 1971. *The Psychology of Commitment: Experiments Linking Behavior to Belief.* Academic Press.

Kurland, N. B., and Egan, T. D. 1990. "Telecommuting: Justice and Control in the Virtual Organization," *Organization Science* (10:4), July/August, pp. 500-513.

Kutner, M.H., Nachtsheim, C.J., Neter, J. and Li, W. 2005. *Applied Linear Statistical Models*, 5th edition, McGraw–Hill, Boston, MA.

Lamb, R., and Davidson, E. 2005. "Information and Communication Technology Challenges to Scientific Professional Identity," *The Information Society*, (21:1), pp. 1-24.

Lapierre, L.M., Spector, P.E., Allen, T.D., Poelmans, S., Cooper, C.L., O'Driscoll, M.P., Lee, W.J. 2008. "A Pilot Survey of Turnover Intention and Its Determinants among Adult Probation Line Officers in Texas," Executive summary, Pilot Survey: Angelo State University.

Li, C., Peters, G.F., Richardson, V.J., and Watson, M.W. 2012. "The Consequences of Information Technology Control Weaknesses on Management Information Systems: The Case of Sarbanes-Oxley Internal Control Reports," *MIS Quarterly*, (36:1), pp. 179-203.

Maddala, G.S. 1988. *Introduction to Econometrics*, 2nd edition. New York, MacMillan.

Mael, F., and Ashforth, B. E. 1992. "Alumni and Their Alma Mater: A Partial Test of the Reformulated Model of Organizational Identification," *Journal of Organizational Behavior*, (13:2), pp. 103-123.

Malhotra, N. K., Kim, S. S., and Agarwal, J. 2004. "Internet Users' Information Privacy Concerns (IUIPC): The Construct, the Scale, and a Casual Model," *Information Systems Research* (15:4), December, pp. 336-355.

March, J. G. and Simon, H. A. 1958. *Organizations.* New York, New York: Wiley.

Markus, H. R., and Kitayama, S. 1991. "Culture and the Self: Implications for Cognition, Emotion, and Motivation," *Psychological Review*, (98: 2), pp. 224.

Martinsons, M.G., and Davison, R.M. 2007. "Strategic Decision Making and Support Systems: Comparing American, Japanese and Chinese Management," *Decision Support Systems*, (43), pp. 284-300.

McClelland, D. C. 1978. "Managing Motivation to Expand Human Freedom," *American Psychologist*, (33:3), pp. 201–210.

McCloskey, D. W. 2010, "Telecommuting Experiences and Outcomes: Myths and Realities," In N. J. Johnson (Eds.), *Telecommuting and Virtual Offices: Issues and Opportunities*, pp. 231-246, Hershey, PA: IGP.

Mowday, R. T., Steers, R. M., and Porter, L. W., 1979. "The Measurement of Organizational Commitment," *Journal of Vocational Behavior*, (14:2), April, pp. 224-247.

Murray, H. A. 1938. *Explorations in Personality*. New York: Oxford University Press.

Neufeld, D. J. and Fang, Y. 2005. "Individual, Social and Situational Determinants of Telecommuter Productivity," *Information and Management*, (42), pp. 1037-1049.

Nunnally, J.C., 1978. *Psychometric Theory*, McGraw-Hill, New York, NY.

Olejnik, S.F.1984. "Planning Educational Research: Determining the Necessary Sample Size," *Journal of Experimental Education*, (53), pp. 40-48.

Olkkonen, M. E., and Lipponen, J. 2006. "Relationships between Organizational Justice, Identification with Organization and Work Unit, and Group-Related Outcomes," *Organizational Behavior and Human Decision Processes*, (100: 2), pp. 202-215.

O'Reilly III, C. A., and Caldwell, D. F. 1981. "The Commitment and Job Tenure of New Employees: Some Evidence of Postdecisional Justification," *Administrative Science Quarterly*, pp. 597-616.

Pedhazur, E. J. 1982. *Multiple Regression in Behavioral Research*, Holt, Rinehart and Wilson, New York.

Posey, C., Bennett, B., Roberts, T., and Lowry, P. 2011. "When Computer Monitoring Backfires: Invasion of Privacy and Organizational Injustice as Precursors to Computer Abuse," *Journal of Information System Security* (7:1), April, pp. 24-47.

Posey, C., Lowry, P.B., Roberts, T., and Ellis, T.S. 2010. "The Online Community Self-Disclosure Model: The Case of Working Professionals in France and the UK who Use on line Communities," *European Journal of Information Systems* (19:2), pp. 181-195.

Pratt, M.G. 1998. "To Be or Not to Be: Central Questions in Organizational Identification," In D.A. Whetten and P.C. Godfrey (Eds.), *Identity in Organizations* (pp. 171-207). Thousand Oaks, Ca. Sage.

Ray, G., Muhanna, W. A., and Barney, J. B. 2005. "Information Technology and the Performance of the Customer Service Process: A Resource-Based Analysis. *MIS Quarterly*, pp. 625-652.

Riketta, M. 2005. "Organizational Identification: A Meta-Analysis," *Journal of Vocational Behavior* (66:2), pp. 358-384.

Robert, L., and Dennis, A. 2005. "Paradox of Richness: A Cognitive Model of Media Choice," *Professional Communication, IEEE Transactions* (48:1), pp 10-21.

Rupp, D. E. 2011. "An employee-centered model of organizational justice and social responsibility." *Organizational Psychology Review* (1.1), pp.72-94.

Ruppel, C. P., and Harrington, S. J. 1995. " Telework: an innovation where nobody is getting on the bandwagon?," *ACM SIGMIS Database*, (26:2-3), May/August, pp. 87-104.

Sanchez, J.I., Brough, P., and Kinnunen, U. 2008. "Family- supportive Organization Perceptions, Multiple Dimensions of Work-Family Conflict, and Employee Satisfaction: A Test of Model across Five Samples," *Journal of Vocational Behavior*, (73:1), August, pp. 92-106.

Sass, J.E., and Canary, D.J. 1991. "Organizational Commitment and Identification: An Examination of Conceptual and Operational Convergence," *Western Journal of Speech Communications*, (55), pp. 275-293.

Straub, D. W. 1989. "Validating Instruments in MIS Research," *MIS Quarterly* (13:2), pp 147-169.

Schachter, S. 1959. *The Psychology of Affiliation*. Stanford University Press.

Scott, C. R., and Timmerman, C. E. 1999. "Communication Technology Use and Multiple Workplace Identifications Among Organizational Telecommuters with Varied Degrees of Virtuality," *IEEE Transactions on Professional Communication*, (42:4), pp. 240- 260.

Sproull, L., and Kiesler, S. 1986. "Reducing Social Context Cues: Electronic Mail in Organizational Communication. *Management Science*, (32: 11), pp. 1492-1512.

Tajfel, H. 1974. "Social Identity and Intergroup Behaviour," *Social Science Information/sur les sciences sociales*.

Thursby, J.S.1989. "A Comparison of Several Specification Error Tests for a General Alternative," *International Economic Review*, (30:1), pp. 217-230.

Thatcher, S. M. B. and Baggger, J. 2011. "Working in Pajamas: Telecommuting, Unfairness Sources, and Unfairness Perceptions," *Negotiation and Conflict Management Research*, (4:3), pp. 248-276.

Timmerman C. E., and Scott, C. R. 2006. "Virtually Working: Communicative and Structural Predictors of Media Use and Key Outcomes in Virtual Work Teams," *Communication Monographs,* (73:1), pp. 108-136.

Thatcher, S. M., and Zhu, X. 2006. Changing Identities in a Changing Workplace: Identification, Identity Enactment, Self-Verification, and Telecommuting. *Academy of Management Review*, (31: 4), pp. 1076-1088.

Tung, L. L., and Turban, E. 1996. "Information Technology as an Enabler of Telecommuting," *International Journal of Information Management*, (16: 2), pp. 103-117.

Turetken, O., Jain, A., Queenberry, B., and Ngwenyama, O. 2011. "An Empirical Investigation of the Impact of Individual and Work Characteristics on Work success," *IEEE Transactions on Professional Communication*, (54:1), March, pp. 56-67.

Turner, J. C., and Oakes, P. J. 1986. "The Significance of the Social Identity Concept for Social Psychology with Reference to Individualism, Interactionism and Social Influence," *British Journal of Social Psychology*, (25: 3), pp. 237-252.

Van Dick, R. 2001. "Identification in Organizational Contexts: Linking Theory and Research from Social and Organizational Psychology," *International Journal of Management Reviews*, (3: 4), pp. 265-283.

Van Dick, R. 2004. "My Job is My Castle: Identification in Organizational Contexts," *International Review of Industrial and Organizational Psychology*, (19), pp. 171-204.

Van Knippenberg, D., and Van Schie, E.C.M. 2000. "Foci and Correlates of Organizational Identification," *Journal of Occupational and Organizational Psychology*, (73), pp. 137-147.

Veroff, J. and Veroff, J.B. 1980. *Social Incentives*. Academic Free Press, New York.

Walsham, G. 1998. "IT and Changing Professional Identity: Micro-Studies and Macro-Theory," *Journal of the American Society for Information Science*, (49:12), pp. 1081-1089.

Wegge J., Bipp T., and Kleinbeck U. 2007. "Goal Setting via Videoconferencing," *European Journal of Work & Organizational Psychology*, (16:2), June, pp. 169-194.

Wiesenfeld, B.M., Raghuram, S., and Garud, R. 1999. "Communication Patterns as Determinants of Organizational Identification in a Virtual Organization," *Organization Science*, 10 (6), 777-790.

Wiesenfeld, B.M., Raghuramb, S., and Garuda, R. 2001. "Organizational Identification among Virtual Workers: The Role of Need for Affiliation and Perceived Work-Based Social Support," *Journal of Management*, (27), pp. 213–229.

Wellman, B., Salaff, J., Dimitrova, D., Garton, L., Gulia, M., and Haythornthwaite, C. 1996. "Computer Networks as Social Networks: Collaborative Work, Telework, and Virtual Community," *Annual Review of Sociology*, (22), August, pp. 213-238.

http://www.bls.gov

http://www.census.gov

http://www.rhi.com

http://www.teleworkresearchnetwork.com

Yap, C. S., and Tng, H. 1990. "Factors Associated with Attitudes towards Telecommuting," *Information and Management*, (19:4), November, pp. 227-235.

Zuboff, S. 1988. *In the Age of Smart Machine: The Future of Work and Power*. Basic Books, New York.