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Job Satisfaction, Organizational Commitment, and Perceived Social Support Among Virtual Workers

Shanna Csikortos
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Walden University
2019

Abstract

Job Satisfaction, Organizational Commitment, and Perceived Social Support Among

Virtual Workers

by

Shanna Csikortos

MS, University of Phoenix, 2009

BS, Northeastern State University, 2006

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Organizational Psychology

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Abstract

This study investigated whether the percentage of time that weekly employees spend in virtual workspaces is related to job satisfaction (JS), organizational commitment (OC), perceived supervisor support (PSS) and perceived coworker support (PCS). One hundred thirty-five virtual workers employed by 1 of 5 large, privately owned companies reported the percentage of their work time spent performing virtual work and completed 4 instruments to measure JS, OC, PSS, and PCS. Data were analyzed using multivariate linear regression, multivariate multiple regression, and multivariate analysis of variance. Results showed that virtual workers who spent 75% or more of their time engaged in virtual work had higher JS, OC, and PSS than virtual workers who spent 25% or less of their work time working virtually. No relationship was found between the percentage of time spent working virtually and PCS. Results were also examined to determine whether gender or age moderated any of the relationships found between the percentage of time working virtually and organizational outcomes. Neither gender nor age moderated the relationships observed. The study results showed that as employee time performing virtual work increases, employee and corporate benefits also increase in large, privately owned companies. The results of the study have several potential implications for positive social change for organizations, employees, and society as a whole by providing information to organizations considering increasing the percentage of time employees spend engaging in virtual work, helping society determine how performing virtual work affects an employee's well-being, potentially providing insight to employees regarding the pros and cons of virtual work.

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Dedication

First and foremost, I would like to give thanks to GOD. By his grace, mercy, favor, and love all things aligned with his will are possible. Next, I would like to express my gratitude to my husband, Anthony. Thank you for your patience throughout this journey, for pushing when I doubted myself, and finally for picking up extra tasks so I could pursue my studies. Without your love and support, this would not have been possible; you are my rock.

Next, to my children Malaysia, Serenity, Tamori, Elijah, and Bella I love you more than words could ever express. Thank you for all the days and nights you sacrificed time with me. You all mean the world to me and know that you all taught me the definition of pure love.

Finally, I want to extend my heartfelt gratitude to all my family and friends that offered words of encouragement throughout this journey.

“Now faith is the assurance of things hoped for, and the evidence of things not seen.”

Hebrews 11:1

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Finally, to my grandmother Blanche Lee Harper, although you are not here with us today, I know you would have been proud to witness this. Your guidance, wisdom, and love made me who I am today. All that I am is because of how you loved me. With each passing day, I miss you more and more, but I know that your legacy lives on in me. I love you Big Mama!

“Do not let your hearts be troubled. You believe in God; also believe in me. My Father’s house has many rooms; if that were not so, would I have told you that I am going there to prepare a place for you? And if I go and prepare a place for you, I will come back and take you to be with me that you also may be where I am.”

John 14:1-3

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Chapter 1: Introduction to the Study

Introduction

Enhancements in technology have prompted organizations to place an increasing number of workers in virtual work roles (Boell, Cecez-Kecmanovic, & Campbell, 2016; Maruyama & Tietze, 2012). In performing virtual work (also called *telework* and *telecommuting*), an employee conducts significant portions of his or her job duties at a location geographically removed from the organization's central offices or production facilities, such as at home, a private office, a client's location, or while traveling (Morganson, Major, Oborn, Verive, & Heelan, 2010). At this remote location, the worker generally has no direct physical contact with co-workers and relies on electronic modes of communication such as video messaging, email, instant messaging, and telephones (Martin & MacDonnell, 2012). When working on a virtual team, an employee's primary interaction with other team members is also via electronic communication, which allows teams to form even though members are distant from one another (Pyöriä, 2011).

Some of the benefits of virtual work include improved workforce utilization, reduced costs for physical office space, and flexibility (Hilbrecht, Shaw, Johnson, & Andrey, 2013; Singhapong, 2013). Due to its advantages, growth in the use of virtual workers can offer a competitive advantage to companies though they must learn how to manage the virtual workplace effectively to capitalize on this advantage (Cascio, 2000). Recent growth in employment of virtual workers is indicated by the proportion of employees who work at home most of the workweek amounting to 5.6% of the

population in 2010, with more than half of virtual workers employed by an organization as opposed to self-employment (Mateyka, Rapino, & Landivar, 2012).

Because the health of an organization is related to the job satisfaction, organizational commitment, and perceived social support of its employees, there is a need to understand how virtual work may affect these organizational outcomes (Morganson et al., 2010). Burman and Shastri (2013) suggested that because virtual teams are new to the organizational world research is needed to examine the relationships of virtual work to organizational commitment and organizational support. Furthermore, Singhapong (2013) called for additional research on the relationships of virtual distance to job satisfaction and organizational commitment. In order to address the research gaps identified within the studies, I investigated a sample of workers who spent a portion of their time performing virtual work to determine how the percent of time employees spent performing virtual work was related to their job satisfaction, organizational commitment, perceived supervisor support, and coworker social support.

This chapter has 12 main sections following this introduction: Background of the Study, Problem Statement, Purpose of the Study, Research Questions and Hypotheses, Theoretical Framework, Nature of the Study, Definitions, Assumptions, Scope and Delimitations, Limitations, Significance, and the Summary and Transition to the next chapter.

Background of the Study

Researchers investigating the relation of virtual work to employee job satisfaction, organizational commitment, and perceived support at work have had mixed

results. Some researchers have found a positive association between virtual work and job satisfaction (Bloom, Liang, Roberts, & Ying, 2015; Vega, Anderson, & Kaplan, 2015). Findings from other studies suggest that virtual work may decrease job satisfaction or that there is no relationship (Kim & Shin, 2015; Weinert, Maier, Laumer, & Weitzel, 2014). Researchers have called for additional research to explore the association between job satisfaction and virtual work (Burman & Shastri, 2013; Martin & MacDonnell, 2012; Morganson et al., 2010; Pyöriä, 2011; Singhapong, 2013).

Researchers studying have also reported mixed findings in the relation between virtual work and organizational commitment and perceived social support at work (Brumm, 2016; Burman & Shastri, 2016; Brunelle, 2012; Kim & Shin, 2015; Sanchuli, Razavi, & Emamgholizadeh, 2014; Scott & Timmerman, 1999; Singhapong, 2013). These constructs are essential because virtual workers have less direct interaction with others in the organization than traditional workers do (Brumm, 2016). Burman and Shastri (2013) studied 100 employees of software companies, with 50 employees working in traditional teams, and 50 working in virtual teams. The researchers found that virtual team employees had significantly higher continuance and normative organizational commitment, but there was no difference between groups in affective commitment. Sanchuli et al. (2014) also found virtual working was positively associated with organizational commitment. However, another study found that working at home, a mobile office or a so-called smart work center was not significantly related to the employees' organizational commitment (Kim & Shin, 2015). Some research on the relationship between virtual work and organizational commitment or organizational

identification has found that the relationship depends on time spent doing virtual work or geographic distance (Bartel, Wrzesniewski, & Batia, 2012; Brunelle, 2012; Singhapong, 2013).

Working in locations separate from an organization's central facilities, virtual workers may perceive that they have less social support from the organization than do traditional workers who are present at those facilities (Sardeshmukh, Sharma, & Golden, 2012). It is essential to understand how virtual work is associated with social support since support is essential to worker well-being (Demerouti, Derks, Ten Brummelhuis, & Bakker, 2014). Perceiving that they are supported socially in their job may serve to assure virtual workers that they are still part of the organization (Wright, 2015).

Dawson-Howard, Standen, and Omari (2013) noted that little research had been conducted on social support in virtual work. Wiesenfeld, Raghuram, and Garud (2001) investigated social support among virtual workers to determine how they "define themselves concerning the organization" found that virtual workers' organizational identification is predicted by their social support at work (p. 213). Sardeshmukh et al. (2012) found that virtual workers perceived significantly reduced social support from supervisors and coworkers. Bentley et al. (2016) found that organizational support for virtual workers reduced social isolation, with the reduction being more significant for those who performed virtual work less than eight hours per week. Brunelle (2013) suggested that for virtual workers, the quality of relations between subordinates and supervisors decreases with their physical and psychological distance from each other. Dawson-Howard et al. suggested that female virtual workers may have a higher need for

social support than men and called for further research on social support and virtual work.

This background shows varying research results on how virtual work may be related to the organizational outcomes of employee job satisfaction, organizational commitment, and perceived social support at work. There is thus a need for further research in these areas. In conducting such research, it is essential to understand that employees may work virtually only a percentage of the time (Brunelle, 2013), and differences in amount of time an employee spends doing virtual work may lead to different outcomes (Bartel et al., 2012; Bentley et al., 2016; Scott & Timmerman, 1999; Virick et al., 2010). Thus, how the proportion of time spent telecommuting is associated with organizational constructs requires further investigation.

Also, there is limited research investigating how demographic factors such as gender and age impact how virtual work is related to organizational outcomes (Johnson, 2016; Saadatabadi, 2013). Dawson-Howard et al. (2013) held that there might be a difference between women and men virtual workers in their need for social support at work, and demographic characteristics such as gender and age may affect how virtual work is potentially associated with other organizational outcomes. Thus, this is another area in which additional research was needed.

Problem Statement

As of 2016, 20-25% of the U.S. workforce performed regular virtual work (Global Workplace Analytics, 2016). Though the size of the virtual workforce is growing, it is not known how the organizational outcomes of job satisfaction,

organizational commitment, and perceived social support at work may be affected by various conditions of virtual work including percentage of time spent performing virtual work (Burman & Shastri, 2013; Morganson, Major, Oborn, Verive & Heelan, 2010; Singhapong, 2013). While some researchers have investigated the factor of percentage of time spent doing virtual work and found it to be related to organizational identification (Bartel et al., 2012; Scott & Timmerman, 1999; Wrzesniewski & Batia, 2012;) and social isolation (Bentley et al., 2016), it appears that most virtual work researchers have not examined how the percentage of time spent performing virtual work in their studies. Thus, further research was needed to determine how the percentage of time spent performing virtual work may be related to organizational outcomes such as job satisfaction, organizational commitment, and perceived social support at work.

Purpose of the Study

The purpose of this quantitative study was to investigate whether the percentage of weekly work time employees spend in virtual workspaces predicts their job satisfaction, organizational commitment, and perceived social support at work from their supervisor and coworkers. Specifically, employees self-classified as to whether they were full-time (35 or more weekly hours) or part-time (less than 35 weekly hours) virtual workers, which they further broke down into weekly time spent performing virtual work as a percentage of total weekly work time. The employees also reported their gender and age. The results of the study may be helpful to organizations that employ virtual workers in their efforts to promote job satisfaction, organizational commitment, and social support at work.

Research Questions and Hypotheses

The following research questions and corresponding hypotheses guided this study:

Research Question 1: Does the percentage of time employees spend performing virtual work predict increased levels of job satisfaction?

H₀₁: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of job satisfaction.

H_{a1}: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of job satisfaction.

Research Question 2: Does the percentage of time employees spend performing virtual work predict increased organizational commitment?

H₀₂: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of organizational commitment.

H_{a2}: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of organizational commitment.

Research Question 3: Does the percentage of time employees spend performing virtual work predict increased levels of their perceived supervisory social support?

H₀₃: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived supervisory social support.

H_{a3}: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of their perceived supervisory social support.

Research Question 4: Does the percentage of time employees spend performing virtual work predict increased levels of their perceived coworker social support?

H₀4: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived coworker social support.

H_a4: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of their perceived coworker social support.

Research Question 5: Does gender moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?

H₀5: Gender does not moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

H_a5: Gender does moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

Research Question 6: Do full-time virtual workers (35 hours or more) have higher job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours)?

H₀6: Full-time virtual workers (35 hours or more) do not have higher levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours).

H_{a6}: Full-time virtual workers (35 hours or more) have higher levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours).

Research Question 7: Does age moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?

H₀₇: Age does not moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

H_{a7}: Age does moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

Theoretical Framework

The theoretical base for the study was social presence theory. Social presence can be defined as a person's sense of being with another in a technologically mediated environment (Biocca, Harms, & Burgoon, 2003). Social presence theory is still in its infancy, but Biocca et al. (2003) outlined the key issues any theory of social presence must address:

- How does technology mediate social interaction?
- What specific aspects of media produce social responses?

- What specific aspects of cognition result in attributing mentality to people and things?
- How can the theory of social presence explain and measure mediated social interactions?

Today, individuals' sense of being with someone else is of particular interest for environments in which the people are in different physical locations and their sense of being together is created through technological means. Going further, virtual workers who are electronically connected to coworkers and supervisors may have a different sense of being with others in a technologically mediated work environment than they would in a traditional work environment (Biocca et al., 2011). Finally, the feeling or sense of isolation that virtual workers potentially experience may be linked to their perception of job satisfaction and organizational commitment (Cascio, 2000) and their perceptions of social support at work (Bentley et al., 2016). Thus, the concept of social presence may be useful in understanding the results of the study. The theory of social presence is further expanded in Chapter 2.

Nature of the Study

The study was a quantitative correlational study. The quantitative correlational design was appropriate because the study sought to investigate whether correlations existed between the independent variable the percentage of time employees spend doing virtual work, the dependent variables job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support, rather age or gender moderated the relationship between the independent and dependent variables

(Curtis, Comiskey, & Dempsey, 2016). Additionally, the study sought to determine if full-time virtual workers had higher levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers. To answer the study's research questions and evaluate the hypotheses, a sample consisting of participants working for private organizations and spend some percentage of time performing virtual work.

For Research Question 1, the 4-item Job Satisfaction Scale was used to evaluate participants' level of job satisfaction (Ellwardt, Labianca, & Wittek, 2012). For Research Question 2, the 15-item Organizational Commitment Questionnaire was used to evaluate participants' level of affective organizational commitment (Mowday, Steers, & Porter, 1979). For Research Question 3, the 16-item Survey of Perceived Supervisory Support was used to evaluate participants' perceived level of supervisor support (Kottke & Sharafinski, 1988). For Research Question 4, the 9-item scale for Perceived Coworker Support was used (Ladd & Henry, 2000). For Research Question 5, participants' responses to the demographic questionnaire were used to determine their gender. For Research Question 6, participants were asked to self-classify whether they were considered to be full-time (working 35 hours or more per week) or part-time (below 35 hours per week) virtual workers. For Research Question 7, participants' responses to the demographic questionnaire were used to determine their age.

For Research Questions 1 to 4, a multivariate linear regression analysis was used to compare participants' responses on the four instruments to their responses on the demographic questionnaire asking them to report the percentage of total weekly work

time they spent doing virtual work. For Research Questions 5 and 7, multivariate multiple regression analysis was used to determine whether the participants' gender or age moderated the relationship between the percentage of total weekly work time spent doing virtual work and the dependent variables. For Research Question 6, a MANOVA statistical analysis was used to determine whether full-time virtual workers (35 hours or more) have higher job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours). The hypotheses evaluated using the .05 level to indicate statistical significance.

Definition of Terms

The following provides operational definitions and explanations of terms frequently used in this study:

ICT: Information and communication technology (Barber & Jenkins, 2014).

Job satisfaction: A feeling that results from a person's perception that the job enables the person's material and psychological needs (Aziri, 2011).

Organizational commitment: Identification with and involvement in an organization characterized by belief in and acceptance of organizational goals and values, willingness to exert significant effort for the organization, and a strong desire to continue with the organization (Mowday et al., 1979).

Perceived coworker social support: The extent to which employees believe that coworkers are willing to provide work-related assistance, including support such as advice, information sharing, respect, and concern (Cureton, 2014).

Perceived supervisor support: The extent to which employees believe that their immediate supervisor values their work and cares about their well-being (Kottke & Sharafinski, 1988).

Social presence: A person's sense of being with another, especially as it pertains to a technologically mediated environment (Biocca et al., 2003).

Telecommuting: Work functions that are regularly performed at home (Noonan & Glass, 2012).

Virtual worker (also called "teleworker"): A worker who performs some portion of his or her work in a virtual workplace, remotely from one another and supervisors (Cascio, 2000).

Work from Home (WFH): A mode of work in which employees work virtually from home with the aid of an Internet connection (Kaplan, 2014).

Assumptions

The following assumptions were made regarding this study:

1. The participants completed the survey instruments honestly and accurately. To make this more likely, instructions to participants emphasized the importance of accuracy in their responses.
2. There was no difference between virtual employees who chose to participate in the study and those who did not that resulted in any selection tendency that biased the study's findings (Nilsen et al., 2013). Because information on nonparticipants was not available, detection of any selection bias was not possible (Khazaal et al., 2014).

3. The effects of any extraneous variables such as participants' mood, lack of sleep, or sickness did not affect their responses to items and did not affect the study's findings in any significant way. This is an assumption that must be made for any study asking participants to provide survey responses unless participants are screened for the presence of such conditions.
4. Participants would respond to all items on the demographic questionnaire and the four instruments. In order to increase probability, instruments that were not overly long were selected. The four instruments to measure the dependent variables had a total of 44 items. The time required for participants to respond to all items was expected to be about 10 minutes.

Scope and Delimitations

The scope of the study examined employees who spent varying percentages of their weekly work time performing virtual work to determine whether the percent of time employees spend engaged in virtual work was statistically significant with employees' job satisfaction, organizational commitment, perceived supervisor support, and coworker social support. The scope also included examining whether the demographic variables of gender and age moderate the relationships between the percentage of time employees spend performing virtual work and the outcome variables. The study also compared full-time virtual workers to part-time virtual workers to determine if the groups had a significant variance when analyzed with the dependent variables.

The relationship of job satisfaction and organizational commitment to virtual work was of particular interest in the study because prior research in these areas has

shown mixed results. The relationship of perceived supervisor and coworker support to virtual work was of particular interest because there appears to have been little prior research in these areas. How gender and age may moderate, any relationship between virtual work and the outcome variables was of interest because very little research had been conducted on how these demographic variables may affect any such relationships.

Moreover, how the percentage of time employees spend performing virtual work may be related to the organizational constructs organizational communication and team effectiveness was not examined in this study. Furthermore, the two aspects of perceived social support at work that this study investigated were perceived coworker support and supervisor support. The study was limited by not investigating the construct of perceived overall organizational support, which may involve other factors such as training and the organization's overall technological support, was restricted to investigating the relationship of variables for virtual workers who were employed by a private organization and did not include virtual workers who were self-employed. The study was restricted to virtual workers who were employed by an organization because the dependent variables are pertinent to virtual workers who are classified as employees of an organization.

Next, the first limitation of the study was that the sample was a purposive sample of virtual workers in one or more companies as opposed to a random sample of all full- and part-time virtual workers in the United States. This limitation was created due to difficulty identifying the set of all full- and part-time virtual workers in the United States. Due to this limitation, strict generalizations of the results of the study cannot be made to the larger population of virtual workers, and results are only suggestive. Finally, the study

did not look at the following variables: distance participants were located from his or her central office, the nature of the virtual work location (e.g., home, private office, or client's office), or an organization's policies concerning virtual workers to determine if any of these factors could affect the participant responses. The limitation was created in order to limit the complexity of the research and the necessary sample size.

Significance of the Study

The study contributes to knowledge about how virtual work may be related to the organizational outcomes of job satisfaction, organizational commitment, and perceived social support at work, extending research conducted by Bentley et al. (2016), Bartel et al. (2012) and Sardeshmukh et al. (2012). The study also adds to knowledge about what roles gender and age may play in the relationship of time spent doing virtual work and the organizational outcomes. Also, the study is significant because it provides organizations with potentially valuable information about how virtual work is related to employee job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support. Organizations may be able to use this information in making decisions about implementing and managing virtual workplace programs.

The study may help bring about social change by providing information on how performing virtual work potentially affects an employee's well-being. A sense of isolation was identified in previous research as a potential adverse outcome for some employees engaged in virtual work (Pyöriä, 2011). The results of the study may assist organizations in deciding whether to design policies that address social isolation thereby contributing to virtual workers' sense of well-being. Job satisfaction and organizational

commitment are also pertinent to virtual workers' sense of well-being, and results of the study may help organizations decide whether they need to develop practices and policies to increase job satisfaction and organizational commitment among their virtual workers.

Summary and Transition

Chapter 1 provided an introduction to the study. The background section focused on the notion that little research had been conducted on how working in virtual workspaces is associated with the four organizational constructs of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support. The research that has been conducted in these areas has shown mixed results.

The problem statement expanded on the premise that it is not known how the organizational outcomes of job satisfaction, organizational commitment, and perceived social support at work may be affected by various conditions of virtual work including the percentage of time employees spend performing virtual work. The purpose the study was to investigate whether the percentage of time employees spend performing virtual work predicted participant's job satisfaction, organizational commitment, and perceived social support at work from their supervisor and coworkers.

The study was a quantitative correlational study that compared the independent variable the percentage of time employees spend performing virtual work with the dependent variables job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support. Two moderators' gender and age were also included in the analysis to determine whether they modified any relationship found between the independent and dependent variables. The study's independent variable was

measured by participants' response to the demographic questionnaire which asked what percent of weekly work time do you spend working virtually. The two moderators were measured by using two questions from the demographic questionnaire that asked participants' to indicate their gender and age.

The dependent variables were measured by participants' responses on four instruments using a 7-point Likert scale. Analysis of the independent variable was performed using multivariate linear regression, multivariate multiple regression, and a MANOVA. The significance level was .05 for all statistical measures to determine statistical significance between the variables.

The study's research questions, hypotheses, theoretical framework theory of social presence, assumptions, scope and delimitations, limitations of the study, the significance of the study was discussed, and key definitions were provided.

Chapter 2 consists of a review of literature relevant to virtual workplaces and the four organizational constructs of interest to this study. Chapter 3 provides a detailed explanation of the study's methodology.

Chapter 2: Literature Review

Introduction

In this chapter, I review literature pertinent to the study. The purpose of this quantitative study was to investigate whether the percentage of weekly work time employees spend in virtual workspaces predicts their job satisfaction, organizational commitment, and perceived social support at work from their supervisor and coworkers. The study had seven research questions and associated hypotheses:

Research Question 1: Does the percentage of time employees spend performing virtual work predict increased levels of job satisfaction?

H₀1: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of job satisfaction.

H_a1: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of job satisfaction.

Research Question 2: Does the percentage of time employees spend performing virtual work predict increased organizational commitment?

H₀2: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of organizational commitment.

H_a2- Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of organizational commitment.

Research Question 3: Does the percentage of time employees spend performing virtual work predict increased levels of their perceived supervisory social support?

H₀₃- Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived supervisory social support.

H_{a3}- Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of their perceived supervisory social support.

Research Question 4: Does the percentage of time employees spend performing virtual work predict increased levels of their perceived coworker social support?

H₀₄: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived coworker social support.

H_{a4}: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of their perceived coworker social support.

Research Question 5: Does gender moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?

H₀₅: Gender does not moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

H_{a5}: Gender does moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

Research Question 6: Do full-time virtual workers (35 hours or more) have higher job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours)?

H₀₆: Full-time virtual workers (35 hours or more) do not have higher levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours).

H_{a6}: Full-time virtual workers (35 hours or more) have higher levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours).

Research Question 7: Does age moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?

H₀₇: Age does not moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

H_{a7}: Age does moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

These research questions were necessary to answer because up to 25% of the U.S. workforce engages in some form of virtual work (Global Workplace Analytics, 2016) and researchers have called for additional research on how organizational outcomes such as

job satisfaction, organizational commitment, and perceived social support may be affected by the conditions of virtual work (Burman & Shastri, 2013; Morganson et al., 2010; Singhapong, 2013). Prior research has not examined the variable of the percentage of time employees spend performing virtual work with organizational outcomes. Thus, further research was necessary to determine how the percent of time spent working virtually may be related to job satisfaction, organizational commitment, and perceived social support at work (Bartel et al., 2012; Scott & Timmerman, 1999). Additionally, little research has been conducted on how employee age or gender may affect the relationships between the percent of time spent performing virtual work and organizational outcomes.

This chapter is divided into eight main sections. The first section reviews studies on social presence, which is the theoretical framework for the study. The second section provides an overview of virtual work. The third section reviews relevant studies on the relation of virtual work to employees' job satisfaction. The fourth section reviews studies on the relation of virtual work to employees' organizational success. The fifth section reviews studies on the relation of virtual work to employees' perceptions of social support at work. This fifth section includes studies of perceived organizational support, supervisor support, and coworker support. The sixth section reviews studies on how gender and age are related to virtual work. The seventh section discusses methods used in the studies reviewed. The eighth section provides a summary of the studies that have been reviewed. Conclusions are drawn about the need for further research on how the percentage of time employees spend performing virtual work predict may be related to

job satisfaction, organizational commitment, and perceived organizational support and on how gender and age may be related to virtual workers' job satisfaction, organizational commitment, or perceived supervisor or coworker support.

Literature Search Strategy

In order to collect data for the study, several literature review queries were used for this study including EBSCO host, EBSCOhost Electronic Journals, Google, Google Scholar, Academic Search Premier, Business Source Premier, U.S Data and Statistics and Deepdyve.com. The key search terms and phrases used in the study when searching for relevant articles included the following terms singly or in combination: virtual work, telework, telecommuting, virtual teams, job satisfaction, organizational commitment, organizational support, social work support, supervisor support, coworker support, age, gender, and social presence. The scope of the literature was restricted to the last five years whenever possible and was restricted to peer-reviewed literature, relevant textbooks, and U.S data and statistics. Due to limited research on the percentage of time employees spend performing virtual work, and the organizational outcomes job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support literature searches were focused on virtual work within the realm of organizational outcomes, age, gender, social isolation, and full-time or part-time hours.

Theoretical Framework: Social Presence

The concept of social presence refers to a person's sense of being with another in a technologically mediated environment (Biocca, Harms, & Burgoon, 2003). Social presence is of crucial importance because it may counter the sense of isolation from

others that virtual workers potentially experience. Social presence may be linked to virtual workers' job satisfaction and organizational commitment (Cascio, 2000). In the study by Bloom et al. (2015), reviewed in the section of this chapter on job satisfaction, many of the employees assigned to the telework group decided to return to the main office at the conclusion of the study due to their experienced isolation, even though the teleworker group had higher levels of job satisfaction. Bloom et al. suggest that factors other than isolation may have resulted in the teleworkers' job satisfaction, while lack of social presence resulting in isolation may have detracted from job satisfaction.

Lack of social presence leading to a sense of isolation may also affect virtual workers' perceived social support at work. Gajendran and Harrison (2007) found that relationships with coworkers deteriorated when virtual workers spent most of their time out of the central office. Bentley et al. (2016), found that social isolation was negatively related to perceived organizational support and that social isolation partly mediated the relationship between organizational social support and job satisfaction. Bartel et al. (2012), Brunelle (2013), Sardeshmukh et al. (2012), and Wheatley (2012), suggested that deficient social presence leading to a sense of isolation may be negatively related to perceptions of organizational support.

Fonner and Roloff (2012) conducted a study of 89 high-intensity teleworkers and 104 office-based employees from a variety of workplaces and found that virtual workers' perception of the degree of social presence was positively related to their organizational identification. Fonner and Roloff also found that virtual workers and office-based employees reported similar perceptions of social presence. Fonner and Roloff suggested

that working remotely does not necessarily diminish the sense of personal connection in workplace interactions.

Fonner and Roloff (2012) noted that while the use of communication media of face-to-face, video conferencing, instant messaging, and phone communication was positively related to the teleworkers' perceptions of social presence, these relationships were not significant. The researchers concluded that increased communication appears to have a minimal effect on increasing perceptions of social presence. However, to support this conclusion, further studies appear to be needed that examine more closely how communication modes and media are related to virtual workers' sense of social presence.

Fonner and Roloff (2012) also found that virtual workers' use of communication media often has an adverse effect of causing unwanted interruptions. This result is in line with Leonardi, Treem, and Jackson's (2010) finding that although virtual workers used various communication strategies to reduce their sense of distance from coworkers, at times, they used other strategies to maintain a sense of distance from coworkers in order to maintain their productivity and efficiency.

Overall, the research reviewed suggests that a sense of social presence affects virtual workers' perceived support from their organization and coworkers because the alternative is a sense of isolation. Furthermore, it is possible that a reduction in perceived organizational support caused by reduced social presence may be associated with a reduction in organizational commitment and job satisfaction. However, the results of the studies by Fonner and Roloff (2012) and Leonardi et al. (2010) suggest that at least in

some instances, lack of social presence may be considered an advantage by virtual workers because it leads to fewer interruptions and higher productivity.

Overview of Virtual Work

Virtual work goes by several different names, including *telework* (Wheatley, 2012), *telecommuting* (Noonan & Glass, 2012), and *remote work* (Busch, Nash, & Bell, 2011). What all of these terms refer to is a type of employment in which employees do part or all of their work at a location different from their main office. What has made widespread virtual work possible in the business world is the development of computer and communication technology enabling almost instantaneous communication by email, voice, and video; the ability to develop and modify documents at any location that has a computer and suitable software; and the ability to quickly transmit text and graphics documents from one location to another. Virtual work may be conducted at home, a client's office, a satellite office, or a business center (Tremblay & Thomsin, 2012). Individuals may do the bulk of their virtual work on their own, or they may be organized into virtual teams of employees who may perform their work at different locations (Gilson, Maynard, Young, Vartiainen, & Hakonen, 2015). Employees who perform virtual work more than 2.5 days per week are considered to be high-intensity virtual workers (Gajendran & Harrison, 2007).

Lister and Harnish (2011) reported that an estimated 2.9 million employees work at jobs for which their home is considered their primary workplace, a number that amounts to 2.3% of the U.S. workforce. A large portion of virtual workers are engaged in professional services, management, sales, and consulting. Of the total number of virtual

workers, 76% work for companies in the private sector. However, over the last several years, the proportion of state and federal employees who are virtual workers has increased. Lister and Harnish (2011) claimed that the number of employees who work in jobs that are compatible with at least part-time virtual work from home is much larger than the number that works from home. A total of 50 million employees work in jobs compatible with virtual work from home, which amounts to 45% of the workforce. Approximately 37% of U.S. workers engage in some form of telework (Brumm, 2016).

Job Satisfaction in Virtual Work

Several studies have been conducted to examine the job satisfaction of virtual workers. For the most part, these studies have found that engaging in virtual work increases job satisfaction. Several studies reviewed in this section provide possible explanations for increased job satisfaction among virtual workers.

Vega, Anderson, and Anderson (2015) conducted a recent study which used a within-person methodology to investigate the job satisfaction of 180 supervisory and nonsupervisory employees employed by a large U.S. government organization. The employees performed telework on some but not all days during a five-day period, with the mean number of teleworking days among the participants being 2.13 days. The within-person methodology enabled the researchers to compare the job satisfaction of individual participants when they were doing telework with their job satisfaction when they were not doing telework.

Vega et al. (2015) found that overall, the employees reported statistically significantly higher levels of job satisfaction and job performance on the days they did

telework compared to days they did not. The employees also performed better on an objective, creative test when they were teleworking.

A strength of Vega et al.'s (2015) study is that it used a within-person design instead of the between-person design that most studies on virtual worker job satisfaction use. A limitation is that the participants were from only one organization of only one kind. Therefore, the results cannot be extended to other governmental organizations or nongovernmental organizations.

Fonner and Roloff (2010) suggested that higher job satisfaction among virtual workers may be partly due to reduced work-life conflict and reduced distractions at work. The researchers examined how the job satisfaction of 89 high-intensity virtual workers (labeled "teleworkers" in the study) was related to their work-life conflict, stress from meetings and other distractions, and frequency and quality of information exchange with colleagues, in comparison to 103 office-based workers. The group of teleworkers was noncontract employees who worked at least three days a week in a location other than the main office. The office workers consisted of individuals who did not have such an agreement with their employer.

Fonner and Roloff (2010) showed that high-intensity teleworkers had significantly higher job satisfaction than office workers and had significantly less work-life conflict. Also, stress from meetings, interruptions, and other distractions was significantly less for the teleworkers than for the office workers, and information exchange frequency was less for the teleworkers. Further analysis showed that work-life conflict and information exchange frequency each partly mediated the positive

association of telework with job satisfaction. Fonner and Roloff concluded that employees who telework the majority of their work time avoid some stressful and distracting workplace aspects, which leads to higher job satisfaction. Being away from the office enables teleworkers to decrease the flow of information and avoid distracting events that cause stress and interfere with their personal life.

A limitation of their study mentioned by Fonner and Roloff (2010) was not selecting their participants randomly. Also, the self-reporting nature of the study may have resulted in the teleworkers exaggerating the benefits of their situation. It is also notable that this study investigated only high-intensity teleworkers, and teleworkers who spent a relatively small percent of their weekly work time may have had different results.

Insofar as virtual workers have some flexibility in where and when they work, McNall, Masuda, and Nicklin (2010) suggested that the job satisfaction of virtual workers may be positively influenced by a better balance between work and family life. McNall et al. examined how flexibility in the workplace was related to job satisfaction, turnover intention, and work-family enrichment among 220 employed adults gathered from an Internet website of individuals interested in participating in studies. The researchers found that the availability of flexible working arrangements predicted work-family enrichment, that work-family enrichment predicted higher job satisfaction and reduced turnover intention, and that the availability of flexible working arrangements was indirectly associated with job satisfaction and turnover intention, mediated by work-family enrichment.

Limitations of their study cited by McNall et al. (2010) included the correlational nature of the study and the fact that the study examined only employees' perceptions of work-family enrichment. The study was restricted to one point in time rather than being longitudinal, and the sample included only individuals who had previously expressed interest in taking Internet surveys.

One study that did not find telecommuting to increase job satisfaction was performed by Masuda et al. (2012), who examined how job satisfaction of 3,918 managers in 15 countries was related to four kinds of flexible working arrangements: telecommuting, flextime, compressed work week, and part-time work. The 15 countries were grouped into three country clusters of five countries each: Anglo, Latin American, and Asian. The researchers assessed demographics, job satisfaction, turnover intention, what type of flexible work arrangement each manager had, and both strain-based and time-based work-family conflict.

Anglo cluster, Masuda et al. (2012) found that the availability of flextime predicted higher job satisfaction, lower turnover intentions, and decreased strain- and time-based work-family conflict. Other forms of flexible working arrangement, including telecommuting, were not related to the outcome variables for Anglos. Masuda et al. found that the availability of telecommuting for Asian workers was related only to increased strain-based work-family conflict, which they suggested were possible because Asian managers might interpret the availability of telecommuting in their companies as evidence that the company is not committed to them.

A limitation of the Masuda et al. (2012) study was the absence of a measure of the managers' frequency or intensity of use of telecommuting and other flexible working arrangements. Masuda et al. also noted that the work-family conflict scale might not have been fully transferable to different cultures, as cultural response tendencies might have affected how participants interpreted questionnaire items.

Gajendran and Harrison (2007) conducted a meta-analysis of 46 studies and suggested that job satisfaction among virtual workers increases at least partly due to lower work-family conflict, as well as increased autonomy. The 46 studies, which examined the benefits and disadvantages to employees of telecommuting, involved a total of 12,883 employees.

Gajendran and Harrison (2007) also found that telecommuting increased job satisfaction and job performance among studies with a total of over 7,000 participants and these outcomes were apparently at least partly mediated by teleworkers' perceived autonomy. Telecommuting also lowered work-family conflict, primarily when the telecommuting was of a high-intensity nature (more than 2.5 days per week), suggesting that lower work-family conflict may partially explain increased job satisfaction among teleworkers.

Gajendran and Harrison (2007) noted that none of the studies in their meta-analysis were randomized, controlled, double-blind studies, which they pointed out would be difficult to apply to telework. Therefore, no causal inferences could be drawn from the results of the analysis. They also pointed out that the self-selection aspect of some studies may have biased results.

Hornung and Glaser (2009) conducted a similar study and suggested that increased job satisfaction among virtual workers may be mediated by perceptions of greater autonomy and lower work-family conflict. Hornung and Glaser investigated 1,008 German workers in the public sphere, 631 of whom were virtual workers and found that intensity of telecommuting increased job satisfaction and the perceived quality of life and reduced work-family conflict among the virtual workers. The researchers also found evidence that beneficial results for job satisfaction and quality of life may be mediated by perceptions of greater autonomy and lower work-family conflict for high-intensity telecommuting.

Hornung and Glaser (2009) noted a limitation within the study was that the positive association of telecommuting with job satisfaction was only partly mediated by work-life conflict and autonomy. Moreover, the researchers suggested that other factors not taken account within the study may have also mediated the association.

Troup and Rose (2012) examined 856 Australian public-sector employees with dependent children less than 15 years of age to determine whether there was a difference in job satisfaction between employees who had taken advantage of available telework opportunities and those who had not. The researchers also investigated whether teleworkers' evaluations of their work-life balance differed depending on whether their telework arrangement was written in a contract or informal.

Troup and Rose (2012) found that teleworkers with both formal and informal arrangements had higher job satisfaction than other workers. However, the scores for job satisfaction were higher for women with a formal arrangement than with an informal

arrangement, and women with a formal arrangement had significantly higher job satisfaction than men with a formal arrangement. Men showed no significant difference in their job satisfaction depending on whether their telework arrangements were formal or informal. Whether the increased job satisfaction among teleworkers was due to a better balance between work and family responsibilities, greater perceived autonomy, or other factors was not determined by the study.

Troup and Rose (2012) noted that one limitation of the study included a relatively small size of the sample, with only seven percent (60) of the sample having formal telework arrangements. A second limitation was that it was not clear from the study whether employees who used telework arrangements did so primarily due to a need to meet work deadlines or because of family responsibilities.

Bloom et al. (2015), conducted a study that investigated job satisfaction, turnover, and work performance of virtual workers. The researchers randomly divided 249 call-center employees within a large Chinese international travel company into two even groups. One group worked from home for nine months, while the other was assigned to work in the office. Results from the experiment showed that the group working from home had higher job satisfaction than the office group, and the attrition rate from the virtual home workers was about half that of the office group. The virtual worker's group assigned to a home office had a 13 percent increase in performance. Bloom et al. attributed the increase to more calls per minute and more work minutes per shift. Bloom et al. noted that the firm found that productivity increased up to 30% and the company saved approximately \$2,000 annually per employee in the work-from-home condition

based on improvements in performance, turnover reduction, and reductions in required office space for employees who worked from home. At the end of the experiment, the company offered the work from home option to all of the firm's employees.

Bloom et al. (2015) suggested that it was a genuine experiment with two randomly chosen groups with two different conditions. It is possible, however, that the type of job involved, which was a call-center employee, was particularly suited to working from home and that other types of position are not as well suited for virtual work. It is notable that many of the employees who had volunteered to be considered for the work from home condition in the Bloom et al. (2015) study decided to return to working in the office at the completion of the study due to their desire not to work in such an isolated environment.

Two studies that investigated how virtual workers' geographical distance from the central office is related to their job satisfaction and other organizational outcomes found contrary results. Singhapong (2013), examined how the job satisfaction of virtual workers is related to the physical distance of the workers from the central office. The sample was 238 employees of a multinational mobile telecommunications company located in Thailand and Indonesia. The employees included engineers, managers, team assistants, human resources personnel, trainers, solution providers, and financial and control employees.

Singhapong's (2013) study showed that the physical distance of teleworkers from their central office was associated with increased job satisfaction. Also, the physical distance from the central office had a small significant positive effect on work

commitment, and job satisfaction had a positive association with affective organizational commitment but not with work commitment. Singhapong also found that if the nature of the work was considered challenging, this led to increased job satisfaction.

One limitation of Singhapong's (2013) study appears to be that it was not clear precisely how physical distance from the central office was measured. Furthermore, Singhapong used the term "virtual distance" throughout the article, even after explaining that virtual distance is conceived as a combination of physical, operational, and affinity distance and even though the study did not measure operational or affinity distance. Use of the term "physical distance" throughout the article might have been more accurate.

A second study on how geographic distance and dispersion are related to the job satisfaction of teleworkers was conducted by Agrifoglio and Metallo (2010). The researchers investigated 128 employees of the National Research Council Institutes of Italy who worked in a total of 76 virtual teams. Team members were located at 22 institute locations that had an average distance from each other of 538 kilometers and communicated by e-mail, phone, chat, or video conferencing.

Agrifoglio and Metallo (2010) found that geographic dispersion of virtual team members was significantly negatively associated with job satisfaction. In addition, the researchers found that the negative association between geographic dispersion and job satisfaction was mediated by team-member exchange quality, which increased job satisfaction. The researchers defined team-member exchange quality as "the reciprocity of relationships between people, regarding assistance and dissemination of ideas and feedback" (p. 13). Agrifoglio and Metallo (2010) suggested that the geographic

dispersion of team members adversely affected their socio-emotional dynamics, thereby reducing their job satisfaction.

Agrifoglio and Metallo (2010) mentioned several limitations to their study. One limitation was the relatively small size of the sample in addition to the lack of stratification of the sample into different areas of research, which could have led to an improved description of the sample. A final limitation was not having done a longitudinal study.

Results from most of the reviewed research suggest that various benefits such as autonomy, improved work-life balance, and greater efficiency may outweigh any concerns about lack of social presence among virtual workers. However, Bloom et al. (2015) suggested that some workers who had volunteered to be in the virtual worker group wanted to return to an office environment at the end of the study due to their perception of isolation. This result suggests that a lack of social presence may have influenced the participants' decision.

Agrifoglio and Metallo's (2010) findings that geographic dispersion of virtual team members was significantly negatively associated with job satisfaction may have been partly due to the virtual workers' sense of social presence decreasing with their geographical distance from each other. However, Singhapong (2013) found that geographic distance from a central office was positively associated with virtual workers' job satisfaction, which suggests that the sense of social presence does not decrease with geographic distance. The relation of geographic distance to virtual workers' sense of social presence is an area where more research is needed.

Organizational Commitment and Virtual Work

Several studies examined organizational commitment among virtual workers. Researchers often divide organizational commitment into three components: affective commitment, normative commitment, and continuance commitment (Meyer, Allen, & Smith, 1993). Affective organizational commitment refers to the employee's desire to remain with an organization based on his or her identification with, involvement in, and emotional attachment to the organization. Normative commitment consists of an employee's desire to stay with an organization based on the idea that staying is ethically obligatory. Finally, continuance commitment refers to an employee's desire to stay with the organization based on his or her realization of the costs of leaving (Meyer et al., 1993).

Sanchuli, Razavi, and Emamgholizadeh (2014) conducted a study of 251 staff and managers at Golestan Medical University and found that employees who performed telework had a significantly higher organizational commitment in three dimensions: affective, normative, and continuance. The correlation was highest between teleworking and affective organizational commitment. Sanchuli et al. (2014) did not investigate what variables may have mediated the relation between telework and organizational commitment. However, they did find that reported quality of life was higher for teleworkers than for non-teleworkers, which suggests the possibility that organizational commitment was more significant among teleworkers partly due to their perceiving that telework increased their quality of life.

A limitation of Sanchuli et al. (2014) was that the research was done with participants from only one Iranian medical organization. Results might not be the same outside Iran or for virtual workers in other kinds of organization. In addition, the sample of teleworkers in the study was small at only 15.

Kim and Shin (2015) examined whether working virtually (called “smart work” in the study) was associated with organizational commitment and investigated how age and gender are related to aspects of teleworkers’ jobs. The sample consisted of 147 teleworkers in the Korean global financial services industry. Kim and Shin examined whether specific aspects of performing telework, including This study investigated whether the percentage of time that weekly employees spend in virtual workspaces is related to job satisfaction (JS), organizational commitment (OC), perceived supervisor support (PSS) and perceived coworker support (PCS). One hundred thirty-five virtual workers employed by 1 of 5 large, privately owned companies reported the percentage of their work time spent performing virtual work and completed 4 instruments to measure JS, OC, PSS, and PCS. Data were analyzed using multivariate linear regression, multivariate multiple regression, and multivariate analysis of variance. Results showed that virtual workers who spent 75% or more of their time engaged in virtual work had higher JS, OC, and PSS than virtual workers who spent 25% or less of their work time working virtually. No relationship was found between the percentage of time spent working virtually and PCS. Results were also examined to determine whether gender or age moderated any of the relationships found between the percentage of time working virtually and organizational outcomes. Neither gender nor age moderated the

relationships found. The study results showed that as employee time performing virtual work increases, employee and organizational benefits also increase in large, privately owned companies. The results of the study have several potential implications for positive social change for organizations, employees, and society as a whole by providing information to organizations considering increasing the percentage of time employees spend engaging in virtual work, helping society determine how performing virtual work affects an employee's well-being. Finally, the study results may potentially provide insight to employees regarding the pros and cons of virtual work, Internet technology complexity, security risks, and task interdependence, were associated with the participants' organizational commitment, defined as the degree employees devote themselves to providing their best practices to the organization.

Kim and Shin (2015) found no association between any of the examined aspects of the telework environment and organizational commitment. The researchers did find that males and females differed in their perceptions of presenteeism and security, with females perceiving security risks in a virtual work environment as being more severe than males did. No differences were found among ages.

A limitation of Kim and Shin's (2015) study was it was limited to one industry, and all virtual workers were located in Korea. Thus the results may not apply to other industries located in other countries. Additionally, the researchers were somewhat unclear about the nature of presenteeism, which they defined as "attending and being exposed to work through ubiquitous accessibility and network" (p. 1), and they did not explain what was meant by a worker having a higher versus a lower perception of presenteeism.

Brunelle (2012) investigated 134 management consultant virtual workers in a large management consulting firm to determine how six dimensions of virtual work were related to the consultant's affective organizational commitment. The researcher found that the technology, work practices, diversity of organizational actors, and cultural dimensions of virtual work were positively related to affective organizational commitment, and the geography and temporal dimensions of virtual work were negatively related to affective organizational commitment.

Brunelle (2012) provided possible explanations for the study's results. The negative relation of physical and temporal distance to affective organizational commitment may have resulted because the management consultants likely desired high-quality interpersonal relationships with colleagues and may have believed that greater distance and time zone differences would hinder the development and maintenance of such relationships. The positive relationship between affective organizational commitment and the other dimensions of virtual work may have been due to management consultants appreciating the diversity, autonomy, and flexibility those other dimensions provided.

A limitation of Brunelle's (2012) study was that it dealt with only one type of virtual worker in one organization, which limits the study's generalizability. A second limitation was that it measured only one dimension of organizational commitment. The study also might have been improved if the researcher had measured whether the various aspects of virtual work that increased or decreased affective organizational commitment were also related to the virtual employees' job satisfaction.

Two studies reviewed in the previous section on job satisfaction also investigated the affective organizational commitment of virtual workers. The first of these was Singhapong's (2013) researched how affective organizational commitment and work commitment of 238 virtual workers were related to their physical distance from the central office. Work commitment was conceptualized as "the desire of employees to remain with their job because of the job itself" (Singhapong, 2013, p. 96).

Singhapong's (2013) study suggested that the physical distance of teleworkers from their central office had a small significant adverse effect on affective organizational commitment and a small significant positive effect on work commitment. In addition, Singhapong found that increased organizational commitment was positively associated with teleworkers' increased responsibility and opportunities provided by the organization to develop expertise. Also, affective organizational commitment was positively associated with job satisfaction.

The second study previously reviewed in the section on job satisfaction was by Agrifoglio and Metallo (2010), who also investigated how geographic distance and dispersion of 128 virtual workers was related to their affective organizational commitment. Agrifoglio and Metallo found that geographic dispersion of virtual team members was significantly negatively associated with affective organizational commitment and that the negative association between geographic dispersion and affective organizational commitment was mediated by team-member exchange quality. The researchers suggested that by adversely affecting their socio-emotional dynamics,

geographical distance reduced not only the virtual workers' job satisfaction but also their affective organizational commitment.

A study whose findings suggest that flexibility to choose their workplace adds to the organizational commitment of virtual workers was conducted by Hunton and Norman (2010). The study sample was 160 medical coders employed by a single health organization with five different hospitals in five cities. The employees were assigned to five different conditions, including a control group (the D group) of 28 employees who worked in a downtown office only. The remainder worked in one of four different telework conditions: home only (H, 31 employees); downtown office and home (DH, 35 employees); home and a satellite office that was closer to their home than the downtown office (HS, 29 employees); or downtown office, home, and satellite office (DHS, 37 employees).

Hunton and Norman's (2010) suggested that after six months showed no significant difference between the D control group and the H telework group in any of the three dimensions of organizational commitment. However, organizational commitment in all three dimensions was significantly higher than both the D and H conditions for employees who could choose to work from either the downtown office or home (the DH group). Furthermore, affective and continuance organizational commitment was significantly highest for the HS and DHS conditions. Normative organizational commitment for the HS and DHS conditions was significantly higher than for the D or H condition but not higher than the DH condition.

Hunton and Norman (2010) suggested that offering alternative telework conditions could be an effective strategy for firms offering telework options. They concluded that the option of choosing telework locations might support employee autonomy, which, according to self-determination theory, fosters greater autonomous self-regulation of externally motivated behavior among employees. This autonomous self-regulation promotes integrated motivation and increases their organizational commitment and performance.

Hunton and Norman (2010) noted that a limitation of their study was that it involved only one company and one occupation, limiting the study's generalizability. In addition, the employees helped decide the telework arrangements, possibly motivating them to make the arrangements successful. A third limitation mentioned by the Hunton and Norman is that throughout the study, other factors might have affected organizational commitment.

A study dealing with the organizational commitment of virtual teams was conducted by Burman and Shastri (2013). Burman and Shastri compared virtual teams to traditional teams in regard to organizational commitment, as well as occupational stress levels. The sample comprised 100 employees working for several software companies, with 50 employees working on virtual teams and 50 working on traditional teams.

Burman and Shastri's (2013) suggested members of virtual teams had significantly higher continuance and normative organizational commitment than the grouped members of traditional teams. However, there was no significant difference between the two teams in their affective organizational commitment. There was no

significant difference between the groups in relation to the aspects of occupational stress aspects.

Burman and Shastri's (2013) noted that a limitation of the study was that the sample was somewhat small. Burman and Shastri did not describe how the participants in the virtual team group worked together as a virtual team, how those ways differed from how the traditional team members worked, or how large or dispersed the virtual teams were.

Martin and MacDonnell (2012) suggested that the relationship between virtual work and organizational commitment may vary with age. The researchers did a meta-analysis of 19 prior studies to determine their overall results concerning possible associations of telework with employees' organizational commitment, retention, productivity, and performance. Papers had to be published since 1991, address one of the four organizational outcomes, measure variables concerning employees' or managers' perceptions, and include an effect size in their analysis or enough information to calculate an effect size.

Martin and MacDonnell's (2012) meta-analysis showed that telework had a small but significant positive relationship with organizational commitment and the other three outcomes. They also found that age was a moderator of the association of telework with organizational commitment, with the correlation being weaker for older employees. Martin and MacDonnell suggested that telework may be more attractive for younger workers and that offering telework might be a way to attract young talented employees.

Martin and MacDonnell (2012) noted that a limitation within their research was that the findings were contingent on variables not included in the study, such as perceptions of career prospects and employee stress. The researchers mentioned that the meta-analysis might have been confounded by the use of different meanings, assumptions, and theoretical frameworks in the different studies analyzed. For example, there were differences among the studies in what was considered to constitute telework, which limited the ability of the meta-analysis to report on the results of specific arrangements for telework, such as from home or satellite offices.

None of the reviewed research on the relation of virtual work to organizational commitment explicitly examined how the sense of social presence may modify the relation. However, Brunelle's (2012) finding that geographic distance was negatively related to virtual workers' organizational commitment suggests the possibility that this was due to social presence decreasing with distance. Agrifoglio and Metallo (2010) and Singhapong (2013) both found that geographic distance was negatively related to affective organizational commitment, which may have been due to social presence decreasing with geographic distance.

Perceived Social Support at Work

Workplace social support can be conceptualized as employees' perceptions of the degree they are valued by their organization and by individuals inside the organization (Kossek et al., 2011). Social support is essential to worker well-being (Demerouti, Derks, Ten Brummelhuis, & Bakker, 2014). Perceiving they are supported socially at work helps assure workers they are part of the organization (Wright, 2015). Individual sources of

social support may include support from supervisors and coworkers (Rousseau & Aube, 2010). Ng and Sorenson (2008) noted that because perceived supervisor support may be interpreted as organizational support, an employee's perceptions of limited supervisor support may affect his or her assessment of organizational support and the employee's attitude toward work.

Several studies conducted within nonvirtual work environments have found that employees' perceptions of the social support they receive at work were associated with outcomes related to organizational success. These include studies finding that perceived organizational support predicted affective, normative, and continuance organizational commitment (Gutierrez, Candela, & Carver, 2012); social support by both supervisors and coworkers predicted affective organizational commitment (Rousseau & Aube, 2010), which predicts organizational citizenship behavior and intention to continue in the job (Dávila & Jiménez, 2012); and perceived supervisor support predicted work engagement (Othman & Nasurdin, 2013) and less sickness absence (Knapstad, Hensing, & Overland, 2014). In addition, perceived organizational and supervisor social support predicted reduced work-family conflict (Kossek et al., 2011; Selvarajan, Cloninger, & Singh, 2013), while supervisor and coworker support enhanced work in teams and lessened adverse effects of family demands on teamwork (Ten Brummelhuis, Oosterwaal, & Bakker, 2012). Also, positive social interactions at work were found to be associated with beneficial physiological results for employees (Heaphy & Dutton, 2008). Finally, a meta-analysis by Ng and Sorenson (2008) examined studies published before 2006 on the possible associations of perceived supervisor support or perceived coworker support with

job satisfaction, affective organizational commitment, and turnover intention. Ng and Sorenson found that both supervisor support and coworker support were positively associated with all three outcome variables, with supervisor support being most strongly associated.

While the studies mentioned above were conducted in nonvirtual work environments, only a limited number of studies have examined how workplace support for virtual workers is related to organizational outcomes. The results of several such studies suggest that because of their unique working arrangements, virtual employees may experience isolation that results in a reduced degree of perceived social support from work sources (Wheatley, 2012). While virtual workers can communicate electronically with others, their distance from main offices may provide them with fewer opportunities to develop close relationships with coworkers. Not being part of social networks at main offices may reduce the social support they receive from the workplace (Sardeshmukh, Sharma, & Golden, 2012). Weinert, Maier, & Laumer (2015) found that virtual worker isolation from coworkers and reduced information significantly predicted work overload, work-home conflict, and role ambiguity. Mahler (2012) emphasized the importance of virtual leaders finding ways to reduce the sense of isolation and promote a sense of social support among virtual workers. The use of social networking technology for reducing teleworkers' sense of isolation was suggested by Bennett, Owers, Pitt, and Tucker (2010).

Bentley et al. (2016) conducted a study on teleworkers' social isolation in relation to their perceived organizational support. Participants for the research were 804 teleworkers for 28 organizations in New Zealand. Of these, 509 were low-intensity

teleworkers who did telework from 1 to 7 hours per week, while 295 did telework 8 hours or more each week (“hybrid” teleworkers, p. 210). Six percent of these hybrid teleworkers were also high-intensity teleworkers who worked more than three days a week. Measures for organizational social support included perceived supervisor, coworker, and organizational support. Also, social isolation, technical and manager support for telework, job satisfaction, and psychological strain were measured.

Bentley et al.’s (2016) suggested that all three components of organizational social support predicted increased job satisfaction and reduced psychological strain among the teleworkers. Organizational social support had the most substantial effect on job satisfaction for the low-intensity teleworkers. In addition, organizational support was negatively related to social isolation. Social isolation was also found to partly mediate the relationships between organizational social support and job satisfaction and psychological strain. The associations of organizational social support with job satisfaction and social isolation were higher for the low-intensity teleworkers than for the hybrid teleworkers.

Limitations of the Bentley et al. (2016) study included being correlational so that causality could not be attributed to the independent variable. Also, the number of high-intensity teleworkers in the sample limited the ability of the researchers to determine the association of organizational social support with high-intensity telework.

Weinert, Maier, Laumer, and Weitzel (2014) investigated the contribution of four teleworking stressors to information technology (IT) teleworkers’ psychological and behavioral exhaustion and their intention to discontinue teleworking. One of the stressors

was the social isolation of employees. The other three stressors were work overload, work-home conflict, and information underload. The sample consisted of 57 IT professionals.

Weinert et al.'s (2014) suggested that teleworker isolation from coworkers and reduced information significantly predicted work overload, work-home conflict, and role ambiguity. Furthermore, these three stressors reduced employees' intention to continue in telework. The stressor of social isolation predicted both the teleworkers' exhaustion and their intention to discontinue teleworking. The strongest predictor of isolation among the four stressors was work overload.

A strength of Weinert et al.'s (2014) study was the investigation of the relationships of several stressors that may negatively affect teleworkers. One of these was isolation. A limitation of the study was the sample size of 57, which seems to be somewhat small. In addition, the participants were all IT professionals, and the results may not be generalizable to teleworkers in other occupations.

Brunelle (2013) conducted a study on how isolation may affect virtual workers' perceptions of organizational support. The study investigated 286 international virtual workers in a management and information technology consulting firm to determine how geographical and psychological distance affect the perceived relational quality between subordinates and superiors. Brunelle noted that research has shown that if the quality of the supervisor-subordinate relationship is weak, the supervisor generally provides only limited emotional support to the subordinate, which tends to reduced worker performance.

Brunelle (2013) found that both geographical and psychological distance between supervisor and subordinate were negatively associated with the perceived quality of the subordinate-superior relationship. The researcher also found that a transformational leadership style moderated the associations between distance and relational quality. He suggested the need for organizations to support virtual workers who are working at a distance from their supervisors or managers.

A limitation of Brunelle (2013) was the restriction to virtual working professionals in a single company in a single sector, which limited generalization of the results. Moreover, the study was correlational and not experimental, so the results could not allow any direction of causality to be determined. Also, the research was limited by not investigating whether the percent of time participants spent doing virtual work was related to the quality of the perceived supervisor-subordinate relationship.

Bartel et al. (2012) conducted two studies on how virtual employees' degree of isolation from organizational members is related to their perceptions of the respect they receive from the organization. Perception of organizational respect is a concept that can be considered similar to virtual employees' perceptions of organizational support. In the first study, the researchers investigated 374 newly hired virtual workers in the consulting services division of a large U.S. technology organization to determine perceptions of organizational respect, physical isolation, and organizational identification. In the second study, the researchers examined the same variables in a sample of 146 virtual workers with varying degrees of tenure in a large technology firm.

Bartel et al. (2012) found that percentage of time working in isolated environments was associated with decreased perceived respect from the organization and decreased organizational identification for both newly hired and longer-tenured virtual workers. The researchers also determined that the decrease in organizational identification was mediated by the decrease in the virtual workers' perceived respect from the organization.

Limitations of Bartel et al.'s (2012) study include that the participants were selected from a single technology company. The researchers also noted that the study was further limited by the fact that it did not investigate what kind of virtual environment experience affected their sense of isolation. A strength of the research was that the same results were found from two independent studies.

Fay and Kline (2011) argued that it was important for organizations to develop coworker communication strategies in order for teleworkers to combat their sense of isolation. In their study, they investigated how the informal communication practices of high-intensity teleworkers relate to the teleworkers' job satisfaction and organizational commitment, and how coworker support in the form of coworker liking might influence those relationships. The study sample included 100 high-intensity teleworkers who worked from remote locations at least three days per week from 12 companies who were invited to take part in the study.

Fay and Kline's (2011) suggested that coworker liking was positively associated with the teleworkers' job satisfaction and organizational commitment and with their communication satisfaction with their coworkers. Teleworkers who had a high degree of

liking for the individual coworker they communicated with the most had a higher degree of organizational commitment no matter how much complaining was involved in the communication. Due to this relationship, Fay and Kline noted that coworker relationships appear to have a buffering effect on the adverse effect of complaining talk on organizational commitment, and that complaining talk, which is often viewed as a negative occurrence, may increase organizational commitment when done with a well-liked coworker. Fay and Kline suggested that such talk may help teleworkers manage and clarify their roles at work.

Limitations of their study mentioned by Fay and Kline (2011) included the fact that only high-intensity teleworkers were examined, and that different degrees of teleworking may require different amounts of interaction. Also, no causal inferences could be made based on the correlational study.

Sardeshmukh, Sharma, and Golden (2012) conducted a study, and the findings suggest that a sense of isolation among teleworkers may have an adverse impact on perceived supervisor and coworker support. The researchers investigated 417 teleworkers in a large Midwestern U.S. supply chain management company to learn how the number of weekly hours spent teleworking was related to their perceived combined organizational support from supervisors and coworkers. They also investigated how perceived organizational support was related to several other outcome variables. Sardeshmukh et al. reported that study participants did telework from 8 to 40 hours weekly, with their mean number of weekly hours being 33.34. The researchers found that the number of hours spent teleworking was negatively associated with the participants'

perceived organizational support from supervisors and coworkers, as well as organizational feedback. The researchers suggested that this might be due to separation from colleagues and reduced richness in communication media. Teleworkers' perceived organizational support was also found to be positively associated with autonomy, role ambiguity, and role conflict.

Limitations of Sardeshmukh et al.'s (2012) study include its restriction to teleworkers in a single company of a single type. The researchers also mentioned that variables such as work-life conflict were not investigated and that the correlational design of the study did not enable causal relations to be inferred from the relationships found.

In a study investigating perceived workplace support and organizational identification among virtual workers, Wiesenfeld et al. (2001) investigated 250 virtual workers who were employed by the sales division of a technology organization. Most of the virtual workers worked mainly from home and while on the road and spent some working time at the company offices. Workplace support included the virtual workers' perceived support by coworkers, their immediate supervisor, and upper management. Wiesenfeld et al. defined organizational identification as the "strength of members' psychological link to the organization" (p. 215). The researchers also measured the virtual workers' need for affiliation, which was the degree to which the teleworkers "value and are oriented toward group memberships and relationships with others" (p. 17).

Wiesenfeld et al.'s (2001) research results suggested a positive association between perceived workplace support and organizational identification. This relationship was especially strong for virtual workers who had a relatively lower need for affiliation

than others. However, perceived workplace support and organizational identification were also associated with the group of relatively higher need virtual workers. Wiesenfeld et al. recommended that in managing virtual workers, managers might consider attempting to strengthen organizational identification among those workers whose need for affiliation is low by increasing their workplace social support.

A limitation of their study mentioned by Wiesenfeld et al. (2001) was its correlational nature, which did not allow any conclusions about causality. The researchers also mentioned the changing nature of virtual work and pointed out that their study might be less relevant in the future when the norm may be virtual work. Like many other studies reviewed above, a third limitation was that the sample was taken from a single company and the results may not be the same for other companies in other sectors.

Azarbouyeh and Naini (2014) suggested that social support provided to teleworkers may sometimes be sufficient. Azarbouyeh and Naini surveyed 111 employees at an Iranian knowledge-based firm to examine whether teleworking had a significant relationship with eight different components of quality of working life. The researchers found that teleworking had a significant positive relationship with all components of quality of work life, including the social relevance of work life and social integration in work. They also found no significant difference in the quality of work life in any of the eight components depending on gender, age, management or non-management employment, or different degrees of education.

Limitations of Azarbouyeh and Naini's (2011) study included the fact that the researchers did not report the number of hours that surveyed employees typically

performed telework each week. They also did not report whether the teleworkers performed their work from home or some other location or whether they performed telework in virtual teams or individually.

Several of the studies reviewed in this section suggest that an inadequate sense of social presence resulting in perceptions of isolation were associated with virtual workers' decreased perceptions of social support at work. These studies include research by Gajendran and Harrison (2007), which indicated that virtual workers' relationships with their coworkers deteriorated when they spent most of their work time away from the main office. Also, Bentley et al. (2016) found that virtual workers' social isolation was negatively related to their perceptions of organizational support and that social isolation partly mediated the relationship between organizational social support and job satisfaction. In addition, research studies conducted by Bartel et al. (2012), Brunelle (2013), Sardeshmukh et al. (2012), and Wheatley (2012), suggest that among virtual workers, a deficient sense of social presence leading to a sense of isolation may be negatively related to perceptions of organizational support.

Gender and Age in Virtual Work

Dawson-Howard et al. (2013) claimed that demographic characteristics such as gender and age might affect how virtual work is associated with other organizational outcomes. However, little research has been conducted on how gender and age are related to virtual work.

One of the few studies done in this area was conducted by Tremblay and Thomsin (2012), who surveyed 1,343 teleworkers in a substantial Belgium information and

communications technology firm to examine several aspects of telework, including age and gender of teleworkers. A subsample of 870 teleworkers reported their degree of satisfaction and dissatisfaction with various aspects of telework.

Tremblay and Thomsin (2012) found that a higher proportion of men than women in the firm reported doing telework at least part of the time (70% vs. 44%). They found no differences in percentages of teleworkers between different ages.

A limitation of their research reported by Tremblay and Thomsin (2012) was the fact that the survey was conducted with telework employees within one organization and it included employees involved in a diverse range of professional categories. It also appears that the researchers did not examine or report whether different genders or different age groups differed on what they found satisfactory or unsatisfactory about telework.

Van Yperen, Rietzschel, & De Jonge, K. M. (2014) conducted a study of 348 workers in a wide variety of industries and suggested that the need for structure at work and relatedness were lower for older workers. Older workers also had a lower need for work-home segmentation. The researcher's results suggest that older workers were more amenable to working away from the central office at times of their choosing, which is a characteristic of virtual is working.

Van Yperen et al. (2014) suggested that younger workers may have a lower preference for working from home because they want to learn from their more experienced colleagues and may feel working from home adversely affects their opportunities to advance at work. Older workers, on the other hand, may rely on expertise

and experience and may have earned the trust necessary for managing their work as they work remotely.

A strength of Van Yperen et al.'s (2014) research was that the sample included virtual workers from a wide variety of industries. The study did have an advantage over other various studies that sampled virtual workers from only one company and one industry. A limitation of the study was its correlational nature that did not allow causal relationships to be determined.

It is notable that Van Yperen et al.'s (2014) research results suggest that older workers may more amenable to telework is contrary to Martin and MacDonnell's (2012) suggestion based on the results of their meta-analysis, which was reviewed earlier in the section on virtual work and organizational commitment. The researchers found that age moderated the association of telework an organizational commitment by making the correlation weaker for older employees. Based on this finding, Martin and MacDonnell suggested the possibility that telework may be more attractive to younger workers,

The U.S. government has issued several reports pertinent to the issue of what proportions of the different genders and different ages are virtual workers in the federal government. The United States Office of Personnel Management (2015) reported that in 2013, federal virtual workers were about equally divided between the genders, with 50% women and 50% men. The United States Office of Personnel Management also reported that in 2013, about three-quarters of federal virtual workers were 40 years of age or older. Using the results of the 2013 Federal Employee Viewpoint Survey (United State Office of Personnel Management, 2015), Bae and Kim (2016) found that females had lower

levels of job satisfaction than men when public agencies officially adopt virtual work but do not allow employees to utilize the program.

Researchers suggest that women and men may have different reasons for preferring to do virtual work. In a survey of 394 British Telecommunications PLC virtual workers, Maruyama and Tietze (2012) found that a higher percentage of women than men reported that doing virtual work helped in their coping with their caring responsibilities. Female teleworkers with dependent children were also significantly more likely than male teleworkers to report a concern about reduced work visibility and career development. Dawson-Howard et al. (2013) argued that research shows that women may need more social support at work than men in order to reduce stress and protect their psychological well-being.

A study reviewed in a previous section that dealt with the effects of gender and age on virtual work was Kim and Shin's (2015) study that found men and women differed in their perceptions of virtual working security, with women perceiving virtual work security risks as more severe than men did. The researchers found no differences among ages in perceptions of various aspects of virtual work.

Summary of Methods of Reviewed Studies

Researchers in the reviewed studies used several different basic research methods. The most common method was a correlational approach, in which the researchers first administered instruments to a sample of virtual workers to measure variables and then used statistical procedures to learn if there were any correlations of variables. This statistical method was used in studies by Bartel et al. (2012), Brunelle (2012), Fay and

Kline (2011), Kim and Shin (2015), Maruyama and Tietze (2012), McNall et al. (2010), Sardeshmukh et al. (2012), Tremblay and Thomsin (2012), Van Yperen et al. (2014), Weinert et al. (2014), and Wiesenfeld et al. (2001). Agrifoglio & Metallo, 2010, Brunelle, 2013, and Singhapong, 2013 used instruments with a sample of virtual workers and also measured their geographical distance from each other or from a central office to determine how distance was related to other variables.

In another group of studies, researchers administered instruments to two samples, a sample of virtual workers and a sample of non-virtual workers, and then compared data from the two samples to determine whether they differed in the outcomes being tested. These studies included research by Bloom et al. (2015), Burman and Shastri (2013), Fonner and Roloff (2010), Herman and Glaser (2009), Hunton and Norman (2010), Sanchuli et al. (2014), Troup and Rose (2012), and Vega et al. (2015).

The third group of studies divided virtual workers into different groups, administered instruments to all the workers, and statistically analyzed the data to learn if there were any differences between the groups. Studies using this statistical method were done by Bentley et al. (2016), Troup and Rose (2012), and Hunton and Norman (2010). Masuda et al. (2012) compared four groups of employees that had flexible work arrangements, with one of the groups being virtual workers.

Gajendran and Harrison (2007) conducted a meta-analysis of primarily or all correlational studies, and Martin and MacDonnell's (2012) did a meta-analysis of studies that included measuring virtual workers' age to examine how age is related to the organizational commitment of virtual workers.

Two similarities were common to the methods used in all or most of the studies. One commonality was the administration of instruments to measure various outcomes among virtual workers or to gather data on both virtual and non-virtual workers. The other commonality was that the vast majority of the studies used correlational methods to decide if there were statistical associations among various aspects of working virtually and the various outcomes measured. These two commonalities influenced the present study by suggesting the administration of instruments and use of a correlational approach for the study.

A second way the reviewed studies influenced the methods of the present study is that few of those studies measured how much time employees spent doing virtual work to determine how the variable of time spent doing virtual work was related to any outcome variables. One such study was done by Fonner and Roloff (2010), who measured whether employees performed virtual worker three days a week or more. Bentley et al. (2016) divided virtual workers into two categories: those who performed virtual work for less than eight hours a week and those who performed virtual work for eight hours or more. Gajendran and Harrison (2007) compared study results for virtual workers in two categories: those who worked more than 2.5 days per week and those who worked fewer hours per week. The only studies that measured the number or percent of weekly hours employees performed virtual work were the studies of Bartel et al. (2012) and Sardeshmukh et al. (2012). Due to the shortage of studies whose methodology included measuring the number or percent of weekly hours employees performed virtual work, it

was decided that for the present study, the percentage of weekly work time that study participants perform virtual work should be one of the key measures in the study.

A third way the reviewed studies influenced the present study's methods is that few of the reviewed studies had collected data on participants' gender or age that was then subjected to statistical analysis. Because of this shortage of studies, it was decided that the present study would include an analysis of the effect of participants' gender and age. In particular, the participants in the present study were asked to report their gender and age, and this data was statistically analyzed to determine whether those demographic variables influenced any associations between the percent of the time performing virtual work and the outcome variables.

A fourth way the reviewed studies influenced the present study is regarding the outcomes that were investigated. Most of the studies reviewed examined the outcomes of job satisfaction, organizational commitment, or perceived social support at work, and a few of the studies examined two of those outcomes. However, none of the reviewed studies examined all those outcomes. This absence of studies investigating all of those important outcomes helped lead to the decision in the present study, the outcomes of job satisfaction, organizational support, supervisory social support, and coworker social support would all be investigated.

The methodology for the present study also followed guidelines suggested by Creswell (2014), who stated that the primary way a study may investigate variables of interest is to conduct a correlational study. Such a study is one in which the degree of association between two or more variables is determined. Creswell maintained that in a

correlational study that uses instruments to measure variables, a detailed description of the instruments should be provided, including who developed the instrument, its reported internal reliability, and its construct validity. Following Creswell's suggestion, this information is reported in Chapter 3 of this dissertation for each instrument used in the study. Creswell advised that for a study using instruments, descriptive statistical analysis should be done, which includes reporting means, standard deviations, and ranges of scores. This study utilized the above approach. Creswell also suggested using Cronbach's alpha score as a measure of the internal reliability of instruments. In Chapter 3 of the present study, this score is reported for the responses to each instrument.

The statistical procedures used in the study included MANOVA, which is appropriate in cases where the independent variable is categorical, and the dependent variable is continuous (Creswell, 2014). The procedures also included multivariate regression, which is an appropriate regression technique when there is more than one dependent variable. Multivariate regression has several advantages over doing a separate regression for each dependent variable. These advantages include showing the joint effect of an independent variable on more than one dependent variable and showing the strength of association of the independent variable on each dependent variable (Snijders & Bosker, 2012).

Summary and Conclusions

This chapter provided a review of the literature on virtual work concerning job satisfaction, organizational commitment, perceived organizational support, age, and gender. The chapter also reviewed literature concerned with virtual work and social

presence. The reviewed studies on job satisfaction found that working virtually increased job satisfaction when compared to working in a central office location. This result was found in studies by Bloom et al. (2015), Fonner and Roloff (2010), Gajendran and Harrison (2007), Hornung and Glaser (2009), Singhapong (2013), Troup and Rose (2012), and Vega et al. (2015),

However, a study by Masuda et al. (2012) found that virtual working did not increase job satisfaction, while Agrifoglio and Metallo (2010) found that geographic dispersion of virtual workers predicted less job satisfaction. Additionally, the findings of several of the studies reviewed suggested explanations for increased job satisfaction among virtual workers included the factors of increased autonomy associated with virtual work, improved work-family relationship due to employees having greater flexibility in working places and times, and fewer interruptions leading to increased productivity (Bloom et al., 2015; Fonner & Roloff, 2010; Gajendran & Harrison, 2007; Hornung & Glaser, 2009; Singhapong, 2013; and Troup & Rose, 2012).

Moreover, several reviewed studies on organizational commitment found that teleworking increases organizational commitment (Martin & MacDonnell, 2012; Sanchuli et al., 2014). Brunelle (2012) and Singhapong (2013) found that several dimensions of virtual work were positively related to affective organizational commitment, while others were negatively related. Hunton and Norman (2010) found that some virtual work conditions were associated with increased organizational commitment and suggested that this might be due to increased autonomy in those conditions. Burman and Shastri (2013) showed that members of virtual teams had

significantly greater continuance and normative organizational commitment but not affective commitment than members of traditional teams.

Going further, researchers from two studies found somewhat contrary results. Agrifoglio and Metallo (2010) found that geographic dispersion of virtual team members was significantly negatively associated with affective organizational commitment while Kim and Shin (2015) found no relation between various aspects of virtual work and organizational commitment. Additionally, the findings of several other reviewed studies on virtual workers' perceptions of organizational social support at work, including supervisor and coworker support, suggest that virtual workers' isolation may decrease their perceptions of organizational support (Bartel et al., 2012; Bentley et al., 2016; Brunelle, 2013; Sardeshmukh et al., 2012).

Next, Weinert et al. (2014) found that isolation increased virtual workers' intention to discontinue virtual work. Fay and Kline's (2011) found that good co-worker relationships led to increased organizational commitment among virtual workers, and Wiesenfeld et al.'s (2001) showed a positive association between perceived workplace support and organizational identification. Azarbouyeh and Naini (2014) suggested, based on their results, that the social support provided teleworkers may sometimes be adequate.

In addition to the reviewed studies listed above, few researchers dealt with how gender and age may be related to working virtually. Yperen et al. (2014) and Martin and MacDonnell (2012) made contrary suggestions about whether virtual work is more attractive to older or younger workers. Regarding gender, studies have suggested that women and men may have different reasons for preferring virtual work and different

perceptions of aspects of virtual work, and women may need more social support as virtual workers. Notably, only one of the reviewed studies examined how different genders or different ages may differ on the organizational outcome variables of job satisfaction, organizational commitment, or perceived organizational support (Troup & Rose, 2012). Troup and Rose found that job satisfaction was higher for female than male virtual workers with a contract arrangement.

Findings in the literature review on social presence suggest that lack of social presence may detract from organizational outcomes such as job satisfaction, perceived organizational support, and organizational identification. Such relationships may be due to a lack of social presence reinforcing a sense of isolation that virtual workers may experience, while the use of communication methods such as telephone and video conferencing may increase social presence while combatting isolation. Fonner and Roloff (2012) and Leonardi et al. (2010) suggested that virtual workers may sometimes consider the lack of communication with other workers to be an advantage, even though this lack may decrease social presence.

The literature reviewed includes few studies that investigate how the amount of weekly time spent doing virtual work is related to organizational outcomes such as job satisfaction and organizational commitment. Exceptions include Vega et al.'s (2015) study that found that workers who divided their time between virtual and traditional work had higher job satisfaction on days they performed virtual work. Fonner and Roloff (2010) reported that virtual workers who worked at least three days a week in a location different from the home office had increased job satisfaction compared to other workers.

Gajendran and Harrison (2007) reported that virtual workers had less work-family conflict, primarily when the employees worked more than 2.5 days per week virtually. Finally, Bentley et al. (2016) found that perceived organizational social support was positively related to job satisfaction for workers who did virtual work for less than eight hours per week compared to those who performed virtual work for more than eight hours. All of these study exceptions divided the time employees spend doing virtual work into only two categories.

Two Studies investigated how the number of weekly hours doing virtual work was related to an outcome variable. Sardeshmukh et al. (2012) found a negative correlation between the number of weekly hours spent doing virtual work and the workers' perceived organizational support from supervisors and coworkers, as well as organizational feedback received. Bartel et al. (2012) found that percentage of time working in isolated environments was associated with decreased perceived respect from the organization and decreased organizational identification.

No other reviewed studies divided the amount of weekly time spent doing virtual work into several categories or a continuous value. Also, none of the studies investigated how weekly time spent doing virtual work is related to all three organizational outcomes of job satisfaction, organizational commitment, and perceived organizational social support.

In conclusion, it is clear from the review of literature that further studies are to determine how the percentage of time working virtually may be related to virtual workers' job satisfaction, organizational commitment, and perceived organizational

support from supervisors and coworkers. Furthermore, there is a dearth of studies that take account of how gender and age may be related to important organizational outcomes. For these reasons, the present study investigated how the percentage of weekly time employees spend doing virtual work is related to the employees' job satisfaction, organizational commitment, and perceived social support from supervisors and coworkers. It also investigated how employees' gender and age may be associated with any relationships found.

The next chapter describes how the methodology of the present study addressed the gaps in the literature by investigating how the percentage of weekly time employees spend working virtually is related to their job satisfaction, organizational commitment, and perceived social support at work and how the employees' gender and age may be associated with any relationships found.

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to investigate whether the percentage of weekly work time employees spend in virtual workspaces predicts their job satisfaction, organizational commitment, and perceived social support at work from their supervisor and coworkers. The study had seven research questions, which included the following:

Research Question 1: Does the percentage of time employees spend performing virtual work predict increased levels of job satisfaction?

H₀1: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of job satisfaction.

H_a1: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of job satisfaction.

Research Question 2: Does the percentage of time employees spend performing virtual work predict increased organizational commitment?

H₀2: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of organizational commitment.

H_a2- Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of organizational commitment.

Research Question 3: Does the percentage of time employees spend performing virtual work predict increased levels of their perceived supervisory social support?

H₀₃- Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived supervisory social support.

H_{a3}- Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of their perceived supervisory social support.

Research Question 4: Does the percentage of time employees spend performing virtual work predict increased levels of their perceived coworker social support?

H₀₄: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived coworker social support.

H_{a4}: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of their perceived coworker social support.

Research Question 5: Does gender moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?

H₀₅: Gender does not moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

H_{a5}: Gender does moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

Research Question 6: Do full-time virtual workers (35 hours or more) have higher job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours)?

H₀₆: Full-time virtual workers (35 hours or more) do not have higher levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours).

H_{a6}: Full-time virtual workers (35 hours or more) have higher levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours).

Research Question 7: Does age moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?

H₀₇: Age does not moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

H_{a7}: Age does moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

This chapter explains the research methods for the study. The chapter consists of four main sections following this introduction. In the first section, the research design and rationale for the study are explained. The second section, focuses on methodology and is

divided into several subsections: population, sampling and sampling procedures, procedures for recruitment, participation, and data Collection, instrumentation and construct operationalization, and the data analysis plan. The third section details threats to external, internal, and construct validity. The fourth section reviews the ethical procedures for the study and is followed by a summary of the chapter.

Research Design and Rationale

The study used a quantitative correlational design to determine whether there were any statistically significant associations between the independent variable and the dependent variables. The study's independent variable was the percentage of time employees spend performing virtual work, and the moderators were the employees' gender and age. The four dependent variables were the employees' job satisfaction, organizational commitment, and perceived social support at work from their supervisor and coworkers. Multivariate linear regression was conducted to determine if the percent of weekly work time spent in virtual workplaces was significantly correlated with any of the four dependent variables.

Multivariate multiple regression was then performed with moderators gender and age to determine if either of those factors modified the associations found between the percentage of weekly work time employees spent in virtual workspaces and the dependent variables. In addition, the multivariate analysis of variance (MANOVA) procedure was used to address Research Question 6 to determine if there were any statistical significance between full-time and part-time virtual workers with any of the dependent variables.

An overall quantitative methodology was appropriate for this study because quantitative methods provide numeric data about variables (Maxwell, 1998). Once the participant's responses were completed, the dataset was downloaded and analyzed using statistical methods to determine whether there were any statistically significant numeric relationships between the independent and dependent variables. The quantitative methods used were in contrast to the use of qualitative methods, which typically involve the gathering of textual or narrative data that are then analyzed using qualitative methods (Maxwell, 1998). This study was not concerned with textual or narrative data or its analysis.

The specific quantitative procedures used for this study included a multivariate regression analysis. Multivariate regression is a form of regression analysis and is the standard statistical procedure used in prior studies conducted on virtual workers (Brunelle 2012; Kim and Shin, 2015; Van Yperen et al., 2014). Multivariate regression was appropriate because the study consisted of multiple categorical dependent variables, a categorical independent variable, and two moderators (Quick, 2013). In particular, this study investigated whether there were any statistically significant relationships between one independent variable, two moderators, and four dependent variables. The analysis by multivariate linear regression and multivariate multiple regression made evident whether there were any significant statistical relationships between percentage of weekly work time employees spend in virtual workspaces and their job satisfaction, organizational commitment, or perceived coworker or supervisor social support, and how gender and age may have been related to any such relationship found. This analysis allowed six of

the study's seven research questions to be answered. The sixth research question was answered based on the results of the MANOVA procedure to determine if full-time virtual workers had a higher level in any of the dependent measures than part-time virtual workers.

A further rationale for the use of multivariate multiple regression was noted by Mendes (2011), who maintained that multivariate multiple regression is preferable to conducting one multiple regression for each dependent variable in analyses where the dependent variables may be correlated. It was considered that such a correlation might have been the case for the present study, where it was possible for there to be correlations among one or more of the dependent variables of employee job satisfaction, organizational commitment, perceived social support from coworkers, and perceived social support from a supervisor. Therefore, the multivariate multiple regression statistical procedure was selected over conducting several multiple regressions.

Methodology

Population

The population for this study consisted of employees of large privately owned companies in the United States who typically spend some percentage of their workweek performing virtual work. The exact size of this population is unknown, but it is estimated to number at least in the hundreds of thousands.

The population did not include self-employed individuals who work virtually, as some of the outcome variables of this study, such as organizational commitment and perceived supervisor support, did not apply to these individuals. The population also did

not include virtual workers in governmental organizations, publicly held companies, or smaller privately held companies with 500 or fewer employees. Only virtual employees of large privately held companies were included in the population.

Sampling and Sampling Procedures

Purposive sampling was used to select a sample to fulfill the purpose of the study. The sample was constructed from employees of large, privately owned companies that had a substantial number of employees who typically spent some percent of their workweek performing offsite virtual work.

Inclusion criteria for the study were employees at least 18 years of age who worked in a large privately owned company and who typically spent some percent of their workweek performing offsite virtual work. Excluded from the study were nonvirtual workers; self-employed virtual workers; and virtual workers in government organizations, publicly held companies, or companies with less than 500 employees.

A priori power analysis was conducted to determine the minimum number of participants needed for the study using the G*Power 3.1.9.2 statistical program (Faul, Erdfelder, Buchner, & Lang, 2009). For the ANOVA procedure with a power of .80, a statistical significance level of .05, and a squared effect size of .25, the minimum number was 128 according to the G*Power program (see Figure 1). The statistical significance level of .05 was selected as a generally accepted value for significance in most social science areas, and the power of .80 is a generally accepted minimum value for power in statistical tests (Zint, n.d.). The effect size of .25 indicates that the statistical procedure can detect what is considered to be a small effect size (Cohen, 1988).

For the multivariate regression procedures that will have multiple dependent variables, the G*Power program did not provide a power analysis procedure to determine sample size nor did the PASS version 15 sample size software (<https://www.ncss.com>). According to Saccetti and Timmerman (2016), methods for determining sample size for multivariate procedures are scarce. However, several rules of thumb exist for regression analysis with multiple variables. These include Dawson and Trapp's (2004) rule that participants should number at least ten times the number of variables in the regression and Green's (1991) rule of at least 50 participants plus eight times the number of independent variables.

Because all of these numbers are less than the 128 minimum number needed for the ANOVAs, 128 is the minimum number of participants needed for the statistical analyses. However, a total of at least 135 participants were sought if for some reason any of the surveys participants submitted were determined to be unusable.

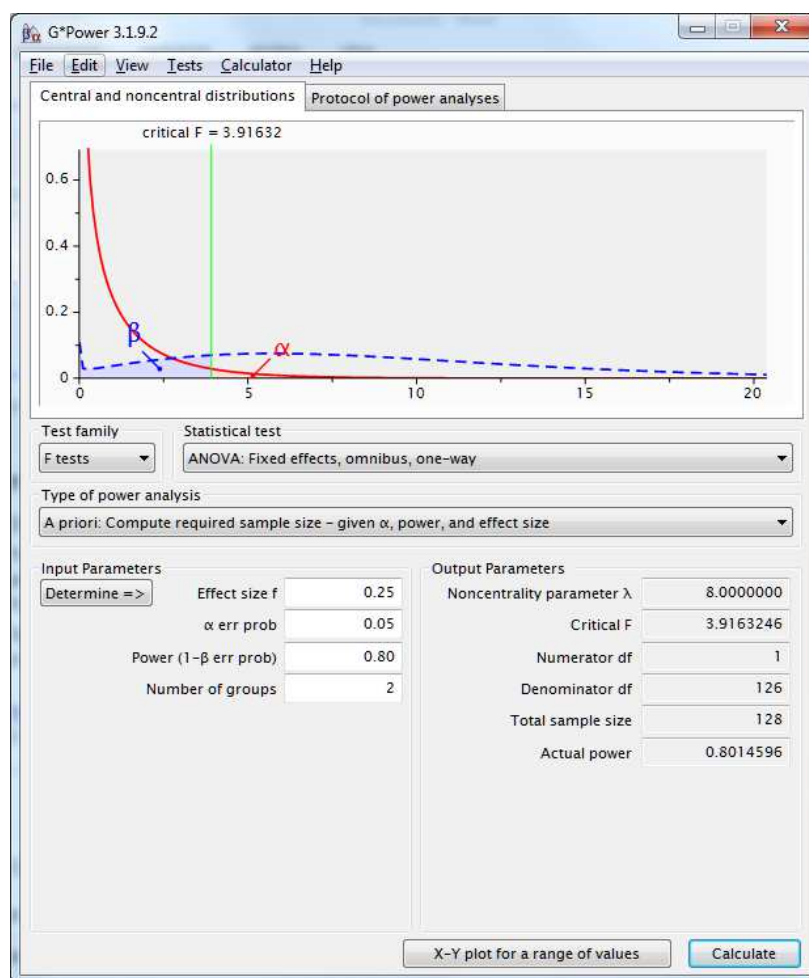


Figure 1. Minimum sample size for ANOVA procedures from the G*Power program.

Procedures for Recruitment, Participation, and Data Collection

Participants were recruited from large, privately-owned companies that had a substantial number of employees who typically spent some percent of their workweek performing offsite virtual work. The recruitment and data collection process consisted of five steps.

Step 1. I contacted, by e-mail and phone, key personnel in the human relations (HR) department of the company where she works to ask for permission to allow virtual

company workers, who total over 400 employees, to participate in the study (Appendix A). The HR personnel was then asked to distribute to their virtual workers, by e-mail, company newsletter, or other company means, a researcher-provided short invitation to take part in the study (Appendix B). The invitation to participate in the study included information about the nature of the study, including the fact that the participants' identity would be anonymous, with no names or personally identifying information collected during the survey. The invitation also included a link to the survey, which was available on the SurveyMonkey website (<https://www.surveymonkey.com>).

Step 2. Employees who followed the link to the survey first reviewed the informed consent form (Appendix C). The consent form included a description of the study, including the expected time it would take to complete the survey, assurances of anonymity, any risks or benefits of the study, and assurances that the participant could withdraw from the study at any time without any penalty. The researcher's name and contact information were also included on the consent form. The consent form page included a button on the bottom that asked whether the employee agreed to participate in the study. When the individual clicked on the button, he or she was taken to the survey. The participant could then take the survey and finish by submitting it online.

Step 3. If, after one week of the invitation being sent, the response appeared not to be sufficient, the researcher contacted key personnel in one or more additional large privately owned companies with a robust virtual workforce and asked them to make their virtual workers aware of the invitation to take part in the study.

Step 4. This process continued until 135 participants had completed the survey.

Step 5. When 135 participants had completed the survey, the results were downloaded so they could be input to perform the required statistical analysis.

Instrumentation and Operationalization of Constructs

The online survey consisted of a demographic questionnaire to measure the study's independent variables and four instruments to measure the dependent variables. The demographic questionnaire (Appendix D) asked participants to report whether they were considered full-time (working 35 hours or more) or part-time (below 35 hours) employees by their employer. They were also asked to report their gender, age, and what percent of their work week they usually performed virtual work by indicating the appropriate category. For the question about gender, participants could choose either male or female. For the question about age, participants could indicate one of four categories: 18-30, 31-45, 46-60, and over 60. For the question about weekly percent of work time spent working in virtual places, participants could indicate 25% or less, 26-50%, 51-75%, or 76-100%. Participants' responses to the questions on the demographic questionnaire were used to construct three categorical independent variables.

Four instruments were used to measure the dependent variables. Permission to use the instruments had been requested and granted for all four instruments (see Appendix K). The first instrument was the Job Satisfaction Scale (JSS; Ellwardt, Labianca, & Wittek, 2012), which was used to evaluate participants' level of job satisfaction (Appendix D). The JSS was used by Ellwardt et al. (2012) in their study of gossip at work among employees in a childcare organization. The scale asks four questions that respondents can respond to on a seven-point Likert scale ranging from very dissatisfied to

very satisfied. Specifically, the JSS asks participants how satisfied they are with their tasks, their salary, their collaboration with their colleagues, and their workload.

The construct validity of the JSS was reported by Ellwardt et al. (2012), who used exploratory factor analysis to determine that all items loaded on one factor, with an eigenvalue of 2.67. The factor explained 67% of the variance. The reliability of the scale, in terms of the Cronbach's alpha value, was .81, which meets the criterion of .80 for basic research suggested by Nunnally (1978). In the study, the dependent variable of Job Satisfaction was formed by calculating the mean numerical response to the four items on the JSS for each participant.

The second instrument was the Organizational Commitment Questionnaire (OCQ; Mowday, Steers, & Porter, 1979), which was used to evaluate participants' level of affective organizational commitment (Appendix F). The 15-item OCQ uses a seven-point Likert scale ranging from strongly agree to strongly disagree. Six of the items are reverse scored. Examples of items on the OCQ are, "This organization really inspires the very best in me in the way of job performance" and "There's not too much to be gained by sticking with this organization indefinitely."

To test the psychometric properties of the OCQ, Mowday et al. (1979) administered the survey to a total of 2,563 employees in nine work organizations. Construct validity was confirmed by a factor analysis that determined that the administrations to the various organizations generally result in a single factor, with variance explained ranging from 83.2% to 92.6%. The reliability of the OCQ as measured by Cronbach's alpha score for the administrations ranged from .82 to .93, with a median

of .90. In the study, the dependent variable of Organizational Commitment was formed by calculating the mean numerical response to the 15 items on the OCQ for each participant.

The third instrument was the Survey of Perceived Supervisory Support (SPSS; Kottke & Sharafinski, 1988), which was used to evaluate participants' perceived level of supervisor support (Appendix G). The SPSS has 16 items and uses a seven-point Likert scale ranging from strongly disagree to strongly agree, with two of the items reverse scored. Examples of items on the SPSS are, "My supervisor is willing to help me when I need a special favor," and "My supervisor cares about my general satisfaction at work."

To measure the validity of the SPSS, Kottke, and Sharafinski (1988) submitted the SPSS to 216 municipal employees in a small Southwestern U.S. city. Factor analysis of the results showed one factor for the SPSS that explained 74.1% of the variance. The instrument's reliability, in terms of the Cronbach's alpha score, was .98. The dependent variable of Perceived Supervisory Support was formed by calculating the mean numerical response to the 16 items on the SPSS for each participant.

The fourth instrument is the Perceived Coworker Support scale (PCS; Ladd & Henry, 2000), which was used to measure the perceived level of coworker support (Appendix H). The PCS has nine items and uses a seven-point Likert scale ranging from strongly disagree to strongly agree. Two items are reverse scored. Examples of items on the PCS are, "My coworkers care about my opinions" and "My coworkers are complimentary of my accomplishments at work."

To determine the construct validity and reliability of the PCS, Ladd, and Henry (2000) submitted the instrument to 428 employees who worked either for a Midwest manufacturing plant or a large government organization in Washington, D.C. When paired with a counterpart survey for perceived organizational support, factor analysis provided a two-factor solution that explained 65.6% of variance. Reliability in terms of the Cronbach Alpha score was .92, indicating strong internal reliability. The dependent variable of Perceived Coworker Support was formed by calculating the mean numerical response to the nine items on the PCS for each participant.

Data Analysis Plan

Data were analyzed using the Statistical Program for the Social Sciences (SPSS program). A relationship was considered to be statistically significant if it achieved at least the .05 significance level.

Data was downloaded from SurveyMonkey and entered into the SPSS statistics program. The data were cleaned and prepared for statistical analysis. First, the responses to the demographic questionnaire and each of the four instruments were checked for completion. There was no problem with uncompleted instruments because the instruments were programmed so that participants could not move to a new instrument until responses had been made to all items on the previous instrument. However, if a participant's information about any of the independent variables of gender, age, or percent of time doing virtual work were missing, that participant's data would not be used for any statistical procedures that required that type of information.

Second, any outliers in participants' responses to the items on each instrument were determined. Checking for outliers was achieved by calculating, for each instrument, the overall median for all participants' responses to all items on the instrument and dividing the dataset into quartiles. The method suggested by Sunith, BalRaju, Sasikiran, and Ramana (2014) was then used to determine, for each instrument, participants whose responses were outliers. This method was to multiply the difference between the third and first quartiles of the dataset by 1.5 and add the difference to the third quartile, with anything above that value being an outlier. Then subtract 1.5 times the difference from the first quartile, with anything below that value being an outlier. If there were any outliers on any of the surveys, that participant's responses were discarded for that survey. In addition, the four dependent variables were checked for multicollinearity.

Statistical analysis began by determining the internal reliability of each of the four instruments measuring dependent variables. In particular, Cronbach's alpha measure was calculated for the responses to each instrument. Participants' mean response to each survey item on all four instruments were then calculated, along with the standard deviations for each survey item. The overall means for all items on each instrument were then calculated to determine the values for the dependent variables. The data analyses to answer the research questions and evaluate the hypotheses were then conducted. The method for conducting the data analyses differed for the varying questions as follows.

The first through fourth research questions asked whether employees' spending a higher percentage of their weekly work time performing virtual work predicted an increased level of job satisfaction, organizational commitment, perceived supervisory

support, or perceived coworker support. To answer these research questions, a multivariate linear regression was conducted using data from all participants. The independent variable for the regression was participants' percent of weekly work time performing virtual work. The dependent variables were the participants' job satisfaction, organizational commitment, perceived supervisory support, and perceived coworker support.

The fifth research question was, "Does gender moderate the relationship between percent of time employees spend weekly performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?" To answer this question, a multivariate multiple regression was conducted. The independent variables were participants' percent of weekly work time spent doing virtual work and gender. The dependent variables were the participants' job satisfaction, organizational commitment, perceived supervisory support, and perceived coworker support.

The sixth research question was, "Do full-time virtual workers (35 hours or more) have higher job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours)?" To answer this question, the MANOVA procedure was conducted to determine if there were any significant differences between the full-time and part-time virtual workers.

The seventh research question was, "Does age moderate the relationship between percent of time employees spend weekly performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived

coworker support?” To answer this question, a multivariate multiple regression was conducted. The independent variables were participants’ percent of weekly work time spent doing virtual work and their age. The dependent variables were the participants’ job satisfaction, organizational commitment, perceived supervisory support, and perceived coworker support.

Threats to Validity

Threats to External Validity

Threats to external validity are conditions that threaten the generalizability of the results of a study. In this study, the threat to external validity came from the fact that a purposive sample was constructed for the study. Because the sample was not randomly selected from the population, this may have led to a distorted representation of the actual population (Heckman, 2010). It, therefore, cannot be assumed that the participants were representative of the population of U.S. virtual workers employed in privately owned companies. Thus, the results for the sample cannot be statistically generalized to that population and are only suggestive for that population

In addition, since the study sample was composed only of virtual workers who worked for large privately owned companies, the results of the study may not apply to virtual workers in different kinds of workplaces. Such virtual workers include those who are self-employed and those who work for governmental organizations, small privately owned companies, or publicly held companies.

Threats to Internal Validity

There were several threats to internal validity, which concerns whether there are any extraneous factors different from the independent variables that may affect statistical relationships. One such extraneous factor was selection bias due to the self-selection nature of the sample. This bias may have occurred if there was a relevant difference between virtual workers who decided to participate in the study and those who did not (Heckman, 2010). For example, virtual workers who decided to participate may have been more or less satisfied with their job or have had more or less organizational commitment than those who decided not to participate.

Also, situational variables may have influenced the results of the study. These variables are factors that affect participants while participating in a study but have no relationship to the independent variable (McLeod, 2008). For instance, at the time of completing the survey, a participant may have had a particularly frustrating workday or a particularly satisfactory work day, and his or her responses to the survey may have reflected the individual's frustrations or satisfaction.

It was also possible for a social desirability bias to affect participants' responses. Social desirability is a bias that results from a participant responding to items in the way he or she thinks would be most socially acceptable or desirable (King & Bruner, 2000). In this event, too, a participant's responses may have been affected by a factor that was different from any of the independent variables.

Finally, though this study investigated whether there were any statistically significant relationships between the independent and dependent variables, a statistical

correlation between variables could not be assumed to be the result of a causal relationship. Thus, even if such relationships were found, it could not be assumed that the relationship was a causal one (Campbell & Stanley, 1963). For example, even if it was found that workers who spent a higher percentage of their workweek performing virtual work had significantly higher job satisfaction than those who spent a smaller percentage of time working virtually, it could not be concluded that their higher job satisfaction was caused by their performing virtual work a higher percentage of time.

Threats to Construct Validity

Threats to construct validity included possibilities that an instrument did not measure the construct it was intended to measure. For the surveys that measured the dependent variables in this study, the researchers who developed and used the surveys reported satisfactory psychometric properties suggesting that the instruments measure what they were intended to measure.

Ethical Procedures

Before the study was undertaken, an application seeking permission to conduct research was submitted to Walden University Institutional Review Board (IRB). The IRB approved the application to conduct research and issued an approval number of 04-11-18-0313937. The approval number was required to be included in the informed consent issued to participants' and served as the official approval to conduct the research study. The study also abided by the ethical guidelines for the Protection of Human Subjects published by the American Psychological Association (Smith, 2003).

Before beginning the online survey, participants were furnished with an online informed consent form that included a description of the study, the expected time to complete the survey, assurances of anonymity and confidentiality, any risks or benefits of the study, assurance that the participant could withdraw from the study at any time without any penalty, and the researcher's name and contact information. When participants clicked on the Agreement button at the bottom of the informed consent, they were taken to the survey.

No participant names or personal identifying information was collected or recorded within the surveys. The online administrator, SurveyMonkey, assigned a consecutive numerical ID number to each completed survey. The researcher protected all of the survey results. These were and will be kept in computer files in a password-protected computer in the researcher's office for five years and then destroyed.

Summary

This chapter described the methodology that was used in the study. The study had a quantitative correlational research design and examined a purposive sample of at least 135 virtual workers who worked in one or more privately owned companies in the United States. Participants were invited to complete an online survey consisting of several demographic questions, a question asking the participant to report the percent of weekly work time he or she spent performing virtual work, and four instruments to measure the dependent variables of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

Analysis of variance, linear multivariate regression, and multiple multivariate regression was conducted to answer the study's seven research questions. The MANOVA procedure was used to determine whether employees who did virtual work full time versus part time had significantly higher scores on any of the dependent variable measures. Linear multivariate regression was used to determine whether the percentage of weekly work time performing virtual work was significantly related to any of the measures for the dependent variables. Multivariate multiple regression was used to determine whether participants' age or gender affected any relationships found between the percentage of weekly time doing virtual work and the dependent variables. Threats to external, internal, and construct validity were also discussed in this chapter. In addition, ethical procedures that were used to inform and protect participants were detailed.

In the next chapter, the results of the research are reported. The final chapter consists of a discussion and interpretation of the study results.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to investigate whether the percentage of weekly work time employees spend in virtual workspaces predicts their job satisfaction, organizational commitment, and perceived social support at work from their supervisor and coworkers. Due to advances in technology, an increasing number of organizations employ workers who spend some portion of their time engaged in virtual work. As such, it is essential for such organizations to understand how the amount of time spent in virtual workspaces may be related to the organizational outcomes of job satisfaction, organizational commitment, and perceived support.

The research questions relevant to this study were as follows:

Research Question 1: Does the percentage of time employees spend performing virtual work predict increased levels of job satisfaction?

H₀₁: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of job satisfaction.

H_{a1}: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of job satisfaction.

Research Question 2: Does the percentage of time employees spend performing virtual work predict increased organizational commitment?

H₀₂: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of organizational commitment.

H_{a2}- Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of organizational commitment.

Research Question 3: Does the percentage of time employees spend performing virtual work predict increased levels of their perceived supervisory social support?

H₀₃- Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived supervisory social support.

H_{a3}- Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of their perceived supervisory social support.

Research Question 4: Does the percentage of time employees spend performing virtual work predict increased levels of their perceived coworker social support?

H₀₄: Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived coworker social support.

H_{a4}: Higher levels of the percentage of time employees spend performing virtual work is related to increased levels of their perceived coworker social support.

Research Question 5: Does gender moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?

H₀₅: Gender does not moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

H_{a5}: Gender does moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

Research Question 6: Do full-time virtual workers (35 hours or more) have higher job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours)?

H₀₆: Full-time virtual workers (35 hours or more) do not have higher levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours).

H_{a6}: Full-time virtual workers (35 hours or more) have higher levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours).

Research Question 7: Does age moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?

H₀₇: Age does not moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

H_{a7}: Age does moderate the relationship between the percentage of time employees spend performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.

In this chapter, the results of the analyses described in Chapter 3 are presented. The chapter is divided into five sections following this introduction. In the first two sections, data collection and data cleaning are described. The third section presents the results of the descriptive analysis of the data. The fourth section presents the results of the inferential analyses. The final section provides a summary of the chapter.

Data Collection

Data collection for the study was done from spring to early summer, 2018. An insufficient number of workers from the first company that was contacted chose to participate in the study. Therefore, several other large, privately owned companies were contacted to ask them to invite their virtual workers to take part in the study. The steps for gaining participants that were explained in Chapter 3 were followed for each company contacted.

Data from virtual workers in five different companies were eventually collected for the study. Due to the anonymity of the study and the fact that the companies agreeing to invite workers to take part in the study did not reveal the number of invitations sent out to their virtual workers, it is impossible to determine the response rates for each company. Also, because it is unknown how many virtual workers are employed by large, privately owned companies in the U.S., it is impossible to determine how proportional the final sample was in relation to the total population of virtual workers employed by large, privately owned companies.

Data Cleansing

The dataset was assessed for outlying values. Outliers were determined using interquartile range, by multiplying the difference between the first and third quartiles of each dependent variable by 1.5, adding that value to the third quartile and subtracting that value from the first quartile. Anything above the value obtained for the third quartile was considered a high outlier, and anything below the value obtained for the first quartile was considered a low outlier (Sunith et al., 2014). For job satisfaction, any value above 7.72 or below 2.46 was considered an outlier. For organizational commitment, any value above 7.00 or below 2.25 was considered an outlier. For perceived supervisory social support, any value above 7.00 or below 3.00 was considered an outlier. For perceived coworker social support, any value above 6.56 or below 2.99 was considered an outlier. There were two low outliers for job satisfaction. There were no outliers for organizational commitment. There was one low outlier for perceived supervisory social support. There was one low outlier for perceived coworker social support. These outliers were removed.

The dataset was also assessed for missing data. Three participants were missing the majority of their data. Two did not answer any items measuring organizational commitment or perceived supervisor and co-worker support, and one did not answer any items measuring perceived supervisor and co-worker support. These three participants were removed. After removing for outliers and missing data, the dataset consisted of 135 participants.

Cronbach's alpha was calculated to determine the reliability of the subscales for this sample. Cronbach's alpha coefficients of .70 and above were considered acceptable

(George & Mallery, 2016). Each subscale had at least acceptable reliability. Table 1 presents the alpha coefficients for each scale.

Table 1

Cronbach's Alpha Coefficients

Scale	α
Job Satisfaction	0.70
Organizational Commitment	0.79
Perceived Supervisory Social Support	0.91
Perceived Coworker Social Support	0.80

Descriptive Analysis

This section reports the results of the descriptive analysis of the survey data. The section is divided into two subsections. The first subsection provides a summary of the demographic characteristics of the sample. The second part summarizes the descriptive results for responses to each of the survey instruments, including ranges, means, and standard deviations for each scale.

Demographic Characteristics

The dataset consisted of similar amounts of male (48.15%) and female (51.85%) participants. The most substantial proportion of participants were 31 to 45 years old (38.52%). A little over a third of the participants worked virtually 51-75% of the time. The majority of the sample worked virtually full time, 35 hours or more (71.85%). Table 2 presents the full frequencies and percentages of these demographic characteristics.

Table 2

Frequency Table for Demographics

Variable	<i>n</i>	%
Hours Worked Virtually		
Less than 35 hours	38	28.15
35 hours or more	97	71.85
Missing	0	0.00
Percent Worked Virtually		
Less than 25%	8	5.93
25-50%	35	25.93
51-75%	47	34.81
76-100%	45	33.33
Missing	0	0.00
Age		
18 to 30	15	11.11
31 to 45	52	38.52
46 to 60	46	34.07
over 60	22	16.30
Missing	0	0.00
Gender		
Male	65	48.15
Female	70	51.85
Missing	0	0.00

Note. Due to rounding errors, percentages may not equal 100%.

Descriptive Statistics for Survey Results

Participants scored an average of 5.17 ($SD = 1.05$) for job satisfaction.

Participants scored an average of 4.72 ($SD = 0.85$) for organizational commitment.

Participants scored an average of 5.08 ($SD = 1.01$) for perceived supervisory social support. Participants scored an average of 4.99 ($SD = 0.96$) for perceived coworker social support. Table 3 presents the full summary statistics for these scales.

Skewness and kurtosis were calculated for these scales as a preliminary measure of normality. Skew less than or equal to 2.00 in absolute value or kurtosis less than 3.00 in absolute value indicates evidence for normality (Westfall & Henning, 2013). As seen in Table 3, skewness and kurtosis for these variables are all within acceptable limits for normality.

Table 3

Summary Statistics for Interval and Ratio Variables

Variable	Min	Max	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
Job Satisfaction	2.75	7.00	5.17	1.05	-0.05	-0.66
Organizational Commitment	3.20	6.60	4.72	0.85	0.81	-0.06
Perceived Supervisory Social Support	3.06	7.00	5.08	1.01	0.54	-0.27
Perceived Coworker Social Support	3.00	7.00	4.99	0.96	0.70	0.03

Note. Min = minimum value found in the sample. Although the scale ranged from 1.00 to 7.00, no participant scored lower than the minimum value listed.

Multivariate Analysis and Hypothesis Testing

In this section, the results of the hypothesis testing for each of the research questions are presented. Variance inflation factor (VIF) values were calculated between the dependent variables of job satisfaction, organizational commitment, perceived supervisory social support, and perceived coworker social support in order to determine whether multicollinearity in the dependent variables would affect the multivariate

analyses. All VIFs were below 5.00, indicating that multicollinearity did not exist between these variables (Stevens, 2016).

Post-hoc Analysis

A post hoc power analysis was conducted using the G*Power 3.1.9.2 statistical program (Faul, Erdfelder, Buchner, & Lang, 2009). For the MANOVA procedure with a power of .80, a statistical significance level of .05, and a squared effect size of .10, the minimum number was 126 according to the G*Power program (see Figure 1). The statistical significance level of .05 was chosen as a generally accepted value for significance in most social science areas, and the power of .80 is a generally accepted minimum value for power in statistical tests (Zint, n.d.). The squared effect size of .10 indicates an effect size of .316, approximately halfway between a small (.2) and a medium (.5) effect size according to (Cohen, 1988). The multivariate regression procedures did not change when the post hoc power analysis was performed, however.

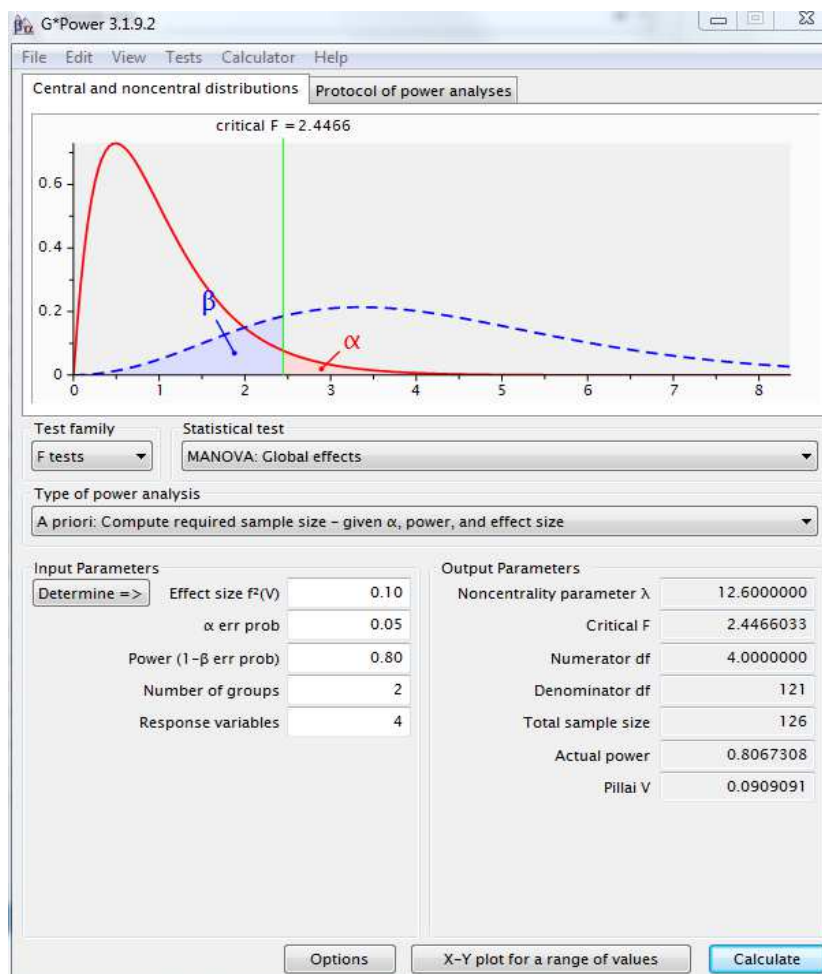


Figure 2. Minimum sample size for MANOVA procedure from the G*Power program.

Results

Research Questions 1-4

In order to answer Research Questions 1-4, multivariate regression was performed. Multivariate regression is the appropriate regression method to perform when there are multiple dependent variables (Quick, 2013). The continuous dependent variables for this analysis were job satisfaction, organizational commitment, perceived supervisory social support, and perceived coworker social support. The categorical

independent variable for this analysis was the percentage of time spent performing virtual work. As this was a categorical predictor (independent variable), dummy coding was necessary for inclusion in the regression model (Field, 2013). Dummy coding involves turning a multi-categorical variable into several binary variables (i.e., coded as 1 and 0), with the 0 category for each dummy variable representing a reference category (Field, 2013). Percentage of time sent performing virtual work was dummy-coded with 0-24% as the reference category.

Prior to interpreting the results of the regression, the assumptions of normality, homogeneity of variances, homogeneity of covariances, and absence of multicollinearity were assessed. Normality was evaluated using Shapiro-Wilk tests (Ghasemi & Zahediasl, 2012). Normality can be assumed if the results are not significant (Ghasemi & Zahediasl, 2012). Results of the Shapiro-Wilk tests are presented in Table 4. Some dependent variables did not meet this assumption at some levels of percentage of time worked. However, the F statistic used for calculating the multivariate regression is robust against violations of normality at large sample sizes (Stevens, 2016). Additionally, statistical tests of normality tend to become overpowered with large sample sizes, indicating that these results may be due to the high sensitivity of the tests (Ghasemi & Zahediasl, 2012).

Table 4

Results of Shapiro-Wilk Test

Scale	Level	Statistic	df	<i>p</i>
Job Satisfaction	Less than 25%	0.89	8	.220
	25-50%	0.97	35	.427
	51-75%	0.98	47	.392
	76-100%	0.92	45	.006
Organizational Commitment	Less than 25%	0.91	8	.326
	25-50%	0.88	35	.001
	51-75%	0.92	47	.002
	76-100%	0.92	45	.003
Perceived Supervisory Social Support	Less than 25%	0.93	8	.557
	25-50%	0.93	35	.020
	51-75%	0.93	47	.005
	76-100%	0.91	45	.001
Perceived Coworker Social Support	Less than 25%	0.86	8	.112
	25-50%	0.95	35	.084
	51-75%	0.95	47	.050
	76-100%	0.91	45	.002

Homoscedasticity was assessed using Levene's tests (Field, 2013). Levene's test was not significant for job satisfaction, $p = .842$, but was significant for organizational commitment, $p < .001$, perceived supervisory social support, $p = .044$, and perceived coworker social support, $p < .001$. This indicates that homoscedasticity could be assumed for job satisfaction, but not for the other dependent variables (Field, 2013). As such, results should be treated with caution. Table 5 presents the results of Levene's test.

Homogeneity of covariances was assessed with Box's M test, which was not significant at the $< .001$ level, $p = .001$, indicating that homogeneity of covariances could be assumed (Tabachnick & Fidell, 2014). VIF values were used to determine if multicollinearity existed between the predictors (independent variables). The VIF values

were all below 5.00, indicating that the assumption was met (Stevens, 2016). Table 6 presents the VIF values for these variables.

Table 5

Levene's Test Values for Percentage Time Spent Working Virtually

Dependent Variable	<i>F</i>	<i>p</i>
Job Satisfaction	0.28	.842
Organizational Commitment	8.11	< .001
Perceived Supervisory Social Support	2.77	.044
Perceived Coworker Social Support	7.09	< .001

Table 6

VIF Values for Dummy Variables of Percentage of Time Spent Working Virtually

Variable	<i>VIF</i>
% Time Spent Working Virtually (ref: 0-24%)	
25-50%	3.98
51-75%	4.48
76-100%	4.42

The results of the overall analysis indicated that percentage of time spent working virtually was not significantly related to the linear combination of the dependent variables for any level of percent time spent working virtually (see Table 7). When viewing the individual parameter estimates, however, the model predicted a significant relationship between high amounts of time spent working virtually (76-100%) and job satisfaction, $B = 0.80$, $p = .043$, organizational commitment, $B = 0.64$, $p = .043$, and perceived supervisory social support, $B = 1.02$, $p = .006$. This indicates that the model predicted that those who spent 76-100% of their time working virtually had 0.80 units higher job satisfaction than those who only worked virtually 0-24% of the time. Thus, the null

hypothesis for Research Question 1 was rejected. The model also predicted that those who worked virtually 75-100% of the time had 0.64 units' higher organizational commitment than those who only worked virtually 0-24% of the time. Thus, the null hypothesis for Research Question 2 was rejected. Finally, the model predicted that those who worked virtually 75-100% of the time had 1.02 units higher perceived supervisory social support than those who worked 0-24% of the time. Thus, the null hypothesis for Research Question 3 was rejected.

The model did not predict any significant differences between those who worked 25-50% of the time or 51-75% of the time and those who worked 0-24% of the time. The model did not indicate any significant relationships between the percentage of time spent working virtually and perceived coworker social support; thus, the null hypothesis for Research Question 4 was retained. Tables 7 and 8 present the full results of the analysis.

Table 7

Multivariate Results for Research Questions 1-4

Variable	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	<i>p</i>	η^2_p
% Time Spent Working Virtually (Ref: 0-24%)					
25-50%	0.65	4	128	.630	0.02
51-75%	0.76	4	128	.551	0.02
76-100%	2.21	4	128	.072	0.06

Table 8

Linear Regression Estimates for Research Questions 1-4

Dependent Variable	Variable	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	η^2_p
Job Satisfaction	% Time Spent Working Virtually (ref: 0-24%)					
	25-50%	0.21	0.40	0.53	.597	0.00
	51-75%	0.20	0.39	0.52	.603	0.00
	76-100%	0.80	0.39	2.04	.043	0.03
Organizational Commitment	% Time Spent Working Virtually (ref: 0-24%)					
	25-50%	0.13	0.32	0.39	.696	0.00
	51-75%	0.08	0.31	0.24	.807	0.00
	76-100%	0.64	0.31	2.04	.043	0.03
Perceived Supervisory Social Support	% Time Spent Working Virtually (ref: 0-24%)					
	25-50%	0.39	0.38	1.03	.304	0.01
	51-75%	0.32	0.37	0.88	.383	0.01
	76-100%	1.02	0.37	2.78	.006	0.06
Perceived Coworker Social Support	% Time Spent Working Virtually (ref: 0-24%)					
	25-50%	0.09	0.36	0.23	.815	0.00
	51-75%	0.18	0.35	0.52	.605	0.00
	76-100%	-0.48	0.36	1.35	.178	0.01

Research Questions 5

In order to answer Research Question 5, a moderated multivariate regression was performed. For this analysis, the independent variable was the percentage

of time spent working virtually. The dependent variables were job satisfaction, organizational commitment, perceived supervisory social support, and perceived coworker social support. The moderator was gender, coded as 0 = male and 1 = female.

Support for moderation requires meeting three conditions: (a) a significant relationship between the independent variable and the dependent variable, (b) a significant relationship between the moderator and the dependent variable, and (c) a significant relationship between the interaction term of the moderator and independent variable and the dependent variable (Baron & Kenny, 1986).

The first step of the analysis was already assessed in the analysis for Research Question 1-4. There was a significant relationship between one level of percentage of time spent working virtually and job satisfaction, organizational commitment, and perceived supervisory support. There was not a relationship between the percentage of time spent working virtually and perceived coworker social support. As such, moderation cannot be supported for perceived coworker social support, and the analysis was continued without this dependent variable in the model.

The second step of the analysis was assessed by adding gender to the model to determine if the moderator had a significant relationship with the dependent variables (non-interaction model). The assumptions of normality, homogeneity of variances, homogeneity of covariances, and absence of multicollinearity for the added variable of gender were assessed. The results of Shapiro-Wilk tests indicated mixed results for normality (see Table 9), which may be due to the sensitivity of the test with large sample

sizes (Ghasemi & Zahediasl, 2012). As the analysis is robust against violations of normality in large sample sizes (Stevens, 2016), the analysis was continued.

Table 9

Shapiro-Wilk Values for Gender

Dependent Variable	Gender	Shapiro-Wilk		
		Statistic	df	p
Job Satisfaction	Male	0.97	65	.069
	Female	0.96	70	.041
Organizational Commitment	Male	0.91	65	.000
	Female	0.91	70	.000
Perceived Supervisory Social Support	Male	0.92	65	.001
	Female	0.93	70	.001

Levene's tests indicated that equality of variances was met for job satisfaction and perceived supervisory social support, but not for organizational commitment (see Table 10). However, for results with gender, group sizes are approximately equal, indicating that the analysis is robust against violations of this assumption (Stevens, 2016). Box's M test was not significant at the $< .001$ level, $p = .011$, indicating that the assumption of homogeneity of covariances was met. VIF values were below 5.00, indicating that absence of multicollinearity may be assumed (see Table 11).

Table 10

Levene's Values for Percentage of Time Working Virtually and Gender

Dependent Variable	F	p
Job Satisfaction	0.57	.780
Organizational Commitment	3.62	.001
Perceived Supervisory Social Support	1.95	.067

Table 11

VIF Values for Percentage of Time Working Virtually and Gender

Variable	VIF
% Time Spent Working Virtually (ref: 0-24%)	
25-50%	3.98
51-75%	4.55
76-100%	4.42
Gender	1.06

Multivariate results for the noninteraction model indicated that there was not a significant relationship between gender and the linear combination of dependent variables, $F(3, 128) = 0.35, p = .791$. Table 12 presents the full results of the overall multivariate results for the non-interaction model. Assessing the parameter estimates, these results were confirmed, as there was no significant relationship between gender and any dependent variable (see Table 13). As such, step 2 of the moderation analysis was not supported, and the analysis was not continued. The null hypothesis for Research Question 5 was retained.

Table 12

Multivariate Results for Research Question 5 (Non-Interaction Model)

Variable	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	<i>p</i>	η^2_p
% Time Spent Working Virtually (ref: 0-24%)					
25-50%	0.42	3	128	.739	0.01
51-75%	0.34	3	128	.763	0.01
76-100%	2.73	3	128	.047	0.06
Gender (ref: male)					
Female	0.35	3	128	.791	.01

Table 13

Linear Regression Estimates for Research Question 5 (Non-Interaction Model)

Dependent Variable	Parameter	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	η^2_p
Job Satisfaction	% Time Spent Working Virtually (ref: 0-24%)					
	25-50%	0.21	0.40	0.53	.597	0.00
	51-75%	0.18	0.39	0.46	.644	0.00
	76-100%	0.79	0.39	2.02	.045	0.03
	Gender (ref: male)					
	Female	-0.08	0.18	0.43	.665	0.00
	Organizational Commitment	% Time Spent Working Virtually (ref: 0-24%)				
25-50%		0.13	0.32	0.39	.697	0.00
51-75%		0.09	0.32	0.27	.784	0.00
76-100%		0.64	0.31	2.04	.043	0.03
Gender (ref: male)						
Female		0.04	0.15	0.27	.789	0.00
Perceived Supervisory Social Support		% Time Spent Working Virtually (ref: 0-24%)				
	25-50%	0.39	0.38	1.03	.306	0.01
	51-75%	0.35	0.37	0.94	.350	0.01
	76-100%	1.03	0.37	2.79	.006	0.06
	Gender (ref: male)					
	Female	0.10	0.17	0.59	.559	0.00

Research Question 6

To answer Research Question 6, a multivariate analysis of variance (MANOVA) was conducted. The categorical independent variable was hours worked virtually (part-time, less than 35 hours vs. full time, 35 hours or more). The dependent variables were

job satisfaction, organizational commitment, perceived supervisory social support, and perceived coworker social support. Prior to interpreting the results of the analysis, the assumptions of normality, homogeneity of variances, and homogeneity of covariances were assessed.

Normality was assessed through Shapiro-Wilk tests (see Table 14). Results for normality were mixed. However, like in regression analyses, the F test used in the MANOVA analysis is robust against violations of normality at large sample sizes (Stevens, 2016). Homogeneity of variances was met for all variables (see Table 15). Homogeneity of covariance's was met ($p = .816$).

Table 14

Shapiro-Wilk Test for Time Spent Working Virtually

Variable	Time Spent Working Virtually	Shapiro-Wilk		
		Statistic	<i>df</i>	<i>p</i>
Job Satisfaction	Part-Time	0.97	38	.403
	Full-Time	0.96	97	.005
Organizational Commitment	Part-Time	0.91	38	.006
	Full-Time	0.90	97	< .001
Perceived Supervisory Social Support	Part-Time	0.92	38	.007
	Full-Time	0.93	97	< .001
Perceived Coworker Social Support	Part-Time	0.89	38	.001
	Full-Time	0.93	97	< .001

Table 15

Levene's Test Values for Time Spent Working Virtually

Dependent Variable	<i>F</i>	<i>p</i>
Job Satisfaction	660	.418
Organizational Commitment	.333	.565
Perceived Supervisory Social Support	.154	.695
Perceived Coworker Social Support	.647	.423

The results of the overall multivariate test indicated that there was not a significant difference between full-time and part-time virtual workers in the linear combination of the dependent variables (see Table 16). Looking at the individual between-subjects effects confirms this result (see Table 17). As such, the null hypothesis for Research Question 6 was retained.

Table 16

Multivariate Results for Research Question 6

Variable	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	<i>p</i>	η^2_p
Hours Worked Virtually	1.42	4	130	.233	.04

Table 17

Between-Subjects Effect for the MANOVA with Time Spent Working Virtually

Source	Dependent Variable	SS	df	MS	F	p	η^2_p
Corrected Model	Job Satisfaction	1.82	1	1.82	1.66	.199	0.01
	Organizational Commitment	0.56	1	0.56	0.78	.380	0.01
	Perceived Supervisory Social Support	0.09	1	0.09	0.08	.773	0.00
	Perceived Coworker Social Support	0.50	1	0.50	0.53	.466	0.00
	Error	Job Satisfaction	145.24	133	1.09	-	-
Error	Organizational Commitment	95.73	133	0.72	-	-	-
	Perceived Supervisory Social Support	136.12	133	1.02	-	-	-
	Perceived Coworker Social Support	123.36	133	0.93	-	-	-

Research Question 7

In order to answer Research Question 7, a moderated multivariate regression was performed. For this analysis, the independent variable was the percentage of time spent working virtually. The dependent variables were job satisfaction, organizational commitment, perceived supervisory social support, and perceived coworker social support. The moderator was age. As age was a categorical variable and percentage of time spent working virtually, dummy coding these variables would result in multiple interaction terms. As the power of moderation analysis already tends to be low (Aguinis, 2004), the age variable was dichotomized into 0 = 18-45 years and 1 = 46+ years in order to reduce the power requirements of the model. If moderation is supported using this dichotomized variable, the full categories will be explored.

For moderation to be supported, three steps must be met: (a) There must be a significant relationship between the independent (predictor) variable and the dependent variable, (b) there must be a significant relationship between the moderator and the dependent variable, and (c) there must be a significant relationship between the interaction term of the moderator and independent variable and the dependent variable (Baron & Kenny, 1986).

The first step of the analysis was already assessed in the analysis for Research Question 1-4. There was a significant relationship between one level of percentage of time spent working virtually and job satisfaction, organizational commitment, and perceived supervisory support. There was not a relationship between the percentage of time spent working virtually and perceived coworker social support. As such, moderation cannot be supported for perceived coworker social support, and the analysis was continued without this dependent variable in the model.

The second step of the analysis was assessed by adding age to the model to determine if the moderator had a significant relationship with the dependent variables (non-interaction model). The assumptions of normality, homogeneity of variances, homogeneity of covariances, and absence of multicollinearity for the added variable of time spent working virtually were assessed. The results of Shapiro-Wilk tests indicated mixed results for normality (see Table 18), which may be due to the sensitivity of the test with large sample sizes (Ghasemi & Zahediasl, 2012). As the analysis is robust against violations of normality in large sample sizes (Stevens, 2016), the analysis was continued.

Table 18

Shapiro-Wilk Values for Gender

Dependent Variable	Age	Shapiro-Wilk		
		Statistic	df	p
Job Satisfaction	18-45 Years	0.96	67	.034
	46+ Years	0.96	68	.030
Organizational Commitment	18-45 Years	0.90	67	< .001
	46+ Years	0.92	68	< .001
Perceived Supervisory Social Support	18-45 Years	0.90	67	< .001
	46+ Years	0.95	68	.010

Levene's tests indicated that equality of variances was met for job satisfaction and perceived supervisory social support, but not for organizational commitment (see Table 19). However, for results with age, group sizes are approximately equal, indicating that the analysis is robust against violations of this assumption (Stevens, 2016). Box's M test was not significant, $p = .326$, indicating that the assumption of homogeneity of covariances was met. VIF values were below 5.00, indicating that absence of multicollinearity may be assumed (see Table 20).

Table 19

Levene's Test Values for Percentage Time Working Virtually and Age

Dependent Variable	F	p
Job Satisfaction	0.37	.916
Organizational Commitment	3.83	.001
Perceived Supervisory Social Support	1.49	.175

Table 20

VIF Values for Percentage Time Spent Working Virtually and Age

Variable	VIF
% Time Spent Working Virtually (ref: 0-24%)	
25-50%	4.02
51-75%	4.55
76-100%	4.52
Age	1.03

Multivariate results for the non-interaction model indicated that there was not a significant relationship between age and the linear combination of dependent variables, $F(3, 128) = 0.08, p = .522$. Table 21 presents the full results of the overall multivariate results for the non-interaction model. Assessing the parameter estimates, these results were confirmed, as there was no significant relationship between gender and any dependent variable (see Table 22). As such, step 2 of the moderation analysis was not supported, and the analysis was not continued. The null hypothesis for Research Question 7 was retained.

Table 21

Multivariate Results for Research Question 7 (Non-Interaction Model)

Variable	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	<i>p</i>	η^2_p
% Time Spent Working Virtually (ref: 0-24%)					
25-50%	0.01	3	128	.669	0.01
51-75%	0.01	3	128	.705	0.01
76-100%	0.07	3	128	.028	0.07
Age (ref: 18-45 Years)					
46+ Years	0.08	3	128	.522	0.02

Table 22

Regression Estimates for Research Question 7 (Non-Interaction Model)

Dependent Variable	Parameter	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	η^2_p
Job Satisfaction	% Time Spent Working Virtually (ref: 0-24%)					
	25-50%	0.25	0.40	0.61	.542	0.00
	51-75%	0.25	0.39	0.63	.533	0.00
	76-100%	0.85	0.40	2.15	.033	0.03
	Age (ref: 18-45 Years)					
	46+ Years	-0.16	0.18	-0.91	.363	0.01
Organizational Commitment	% Time Spent Working Virtually (ref: 0-24%)					
	25-50%	0.16	0.32	0.50	.621	0.00
	51-75%	0.12	0.31	0.38	.707	0.00
	76-100%	0.69	0.32	2.19	.030	0.04
	Age (ref: 18-45 Years)					
	46+ Years	-0.16	0.14	-1.14	.258	0.01
Perceived Supervisory Social Support	% Time Spent Working Virtually (ref: 0-24%)					
	25-50%	0.44	0.38	1.17	.245	0.01
	51-75%	0.39	0.37	1.05	.295	0.01
	76-100%	1.10	0.37	2.98	.003	0.06
	Age (ref: 18-45 Years)					
	46+ Years	-0.25	0.17	-1.50	.136	0.02

Summary

The results of the study based on the statistical analyses of the variables are summarized in Table 23. In the following chapter, an interpretation of the findings within the context of the extant literature, limitations of the study, recommendations for future research, the implications of the study, and conclusions will be discussed.

Table 23

Summary of Research Questions and Statistical Results

Research Questions	Hypothesis	Results
RQ1- Does the percentage of time employees spend performing virtual work predict increased levels of job satisfaction?	H01- Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of job satisfaction.	The null hypothesis was rejected. Working virtually 75-100% of the time predicted increases in job satisfaction when compared to individuals who only worked virtually 0-24% of the time.
RQ2- Does the percentage of time employees spend performing virtual work predict increased organizational commitment?	H02- Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of organizational commitment.	The null hypothesis was rejected. Working virtually 75-100% of the time predicted increases in organizational commitment when compared to individuals who only worked virtually 0-24% of the time.
RQ3- Does a high level of the percentage of time employees spend performing virtual work predict increased levels of their perceived supervisory social support?	H03- Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived supervisory social support.	The null hypothesis was rejected. Working virtually 75-100% of the time predicted increases in perceived supervisory support when compared to individuals who only worked virtually 0-24% of the time.
RQ4- Does a high level of the percentage of time employees spend performing virtual work predict increased levels of their perceived coworker social support?	H04- Higher levels of the percentage of time employees spend performing virtual work is not related to increased levels of their perceived coworker social support.	The null hypothesis was retained. No significant relationship between percentage of time worked virtually and perceived coworker social support.
RQ5- Does gender moderate the relationship between percent of time employees spend weekly	H05- Gender does not moderate the relationship between percent of time employees spend weekly	The null hypothesis was retained. Moderation of the relationship between percentage of time worked

performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?	performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.	virtually and the dependent variables of job satisfaction, organizational commitment, perceived supervisory social support, or perceived coworker social support by gender was not supported.
RQ6-Do full-time virtual workers (35 hours or more) have greater job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours)?	H06- Full-time virtual workers (35 hours or more) do not have greater levels of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker social support than part-time virtual workers (below 35 hours).	The null hypothesis was retained. No significant difference between full-time and part-time virtual workers in job satisfaction, organizational commitment, perceived supervisory social support, or perceived coworker social support.
RQ7- Does age moderate the relationship between percent of time employees spend weekly performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support?	H07- Age does not moderate the relationship between percent of time employees spend weekly performing virtual work and their job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support.	The null hypothesis was retained. Moderation of the relationship between percentage of time worked virtually and the dependent variables of job satisfaction, organizational commitment, perceived supervisory social support, or perceived coworker social support by age was not supported.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative correlational study was to investigate whether the percentage of weekly work time employees spend in virtual workspaces predicts their job satisfaction, organizational commitment, and perceived social support at work from their supervisor and coworkers and whether any correlations that were found were affected by participants' gender or age. The study's independent variable was the percentage of work time performing virtual work. The dependent variables were job satisfaction, organizational commitment, perceived supervisor social support, and coworker social support at work. The moderators were gender and age.

The study included 135 employees who performed virtual work in one of five large privately owned companies. The participants also completed a survey consisting of demographic questions along with four instruments to measure job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support. Survey data were statistically analyzed using multivariate linear regression, multivariate multiple regression, and MANOVA.

Results revealed several statistically significant relationships between variables. Working virtually 75-100% of the time predicted significant increases in job satisfaction, organizational commitment, and perceived supervisory support when compared to individuals who only worked virtually 0-24% of the time. There was no significant relationship between the percentage of time worked virtually and perceived coworker social support. Neither participant gender nor age moderated the relationship between the

percentage of time worked virtually and the dependent variables of job satisfaction, organizational commitment, perceived supervisory social support, or perceived coworker social support. There was no significant difference between full-time and part-time virtual workers in job satisfaction, organizational commitment, perceived supervisory social support, or perceived coworker social support.

This chapter presents a discussion of the results. The chapter is divided into five sections following this introduction. The first section consists of an interpretation of the findings. The second section focuses on the limitations of the study. The third section provides several recommendations that follow from the findings. The fourth section presents a discussion of the study's implications for social change. The fifth section consists of the conclusion of the study.

Interpretation of the Findings

This study investigated how the percentage of work time spent doing virtual work is related to the important organizational outcomes of job satisfaction, organizational commitment, and perceived support from supervisors and coworkers. In regard to the outcome of job satisfaction, most of the studies on virtual work reviewed in Chapter 2 found that working virtually increased job satisfaction when compared to working in a central office location (Bloom et al., 2015; Fonner & Roloff, 2010; Gajendran & Harrison, 2007; Hornung & Glaser, 2009; Singhapong, 2013; Troup & Rose, 2012; Vega et al., 2015). However, only three of the studies (Gajendran & Harrison, 2007; Hornung and Glaser, 2009; Vega et al., 2015) investigated whether amount or percentage of time spent doing virtual work is associated with job satisfaction. Thus, there was a need for

further research on how virtual employees' job satisfaction is related to the time they spend doing virtual work.

This study found that employees of large private companies who spent three-quarters or more of their work time working virtually had higher job satisfaction than employees who spent one-quarter or less of their work time working virtually. These results agree with those of three previous studies in which researchers investigated how the length of work time spent working virtually is related to job satisfaction. First, Vega et al. (2015), found that workers who spent some of their days doing virtual work and other days performing traditional work had increased job satisfaction on the days they performed virtual work. Second, Fonner and Roloff (2010) found that virtual workers who worked three days a week or more in a location different from their home office had increased job satisfaction compared to those who spent less than three days doing virtual work. Third, Hornung and Glaser (2009) found that the percentage of time spent doing virtual work among virtual workers was significantly associated with increased employee job satisfaction and perceived quality of life. In a fourth study, Gajendran and Harrison (2007) reported that employees who worked virtually more than 2.5 days per week reported a reduced work-family conflict in comparison to those who did not. In this case, the factor of reduced work-family conflict may have also resulted in higher job satisfaction (Gajendran & Harrison, 2007). Considered together, the results of these previous studies suggest that virtual workers' spending a higher proportion of work time working virtually is positively associated with increased job satisfaction.

The results of the present study, which showed that job satisfaction increased among those employees who spent most of their work time (75% or more) doing virtual work compared to those who spent considerably less of their work time (25% or less) doing virtual work, are in agreement with the results found by Vega et al. (2015), Fonner and Roloff (2010), and Hornung and Glaser (2009). They are also in agreement with the results found by Gajendran and Harrison (2007), who suggested that reduced work-family conflict is a factor that tends to increase job satisfaction.

There are several possible explanations for the increased job satisfaction for virtual workers who spend a higher amount or percentage of their time doing virtual work as was found in the present study and others mentioned above. One possible explanation for these findings is that virtual workers perceive that they have increased autonomy when working virtually. This is evidenced by the finding that an increased sense of autonomy was found to at least partly mediate virtual workers' increased job satisfaction in the meta-analysis performed by Gajendran and Harrison (2007). Several other researchers have also referred to the perception of autonomy as a positive factor. Hornung and Glaser (2009) found evidence that perceptions of greater autonomy may mediate beneficial results for job satisfaction and quality of life. Brunelle (2012) viewed increased autonomy as a factor that employees appreciate. Hunton and Norman (2010) suggested that being able to choose virtual work may support employees' autonomy, thereby fostering greater self-regulation of externally motivated behavior among employees. In the present study, virtual workers who spent 75% or more of their work time performing virtual work may have had a greater sense of autonomy than those who

spent 25% or less of their work time doing virtual work, contributing to higher job satisfaction.

Another factor that may help explain the finding that virtual workers who spent 75% or more of their time doing virtual work had higher job satisfaction than those who spent 25% or less of their time doing virtual work is reduced work-family conflict, as suggested by Hornung and Glaser (2009) and Troup and Rose (2012). In their meta-analysis, Gajendran and Harrison (2007) also suggested that job satisfaction increases among virtual workers at least partly due to lower work-family conflict, especially among virtual workers who performed virtual work more than 2.5 days per week. Therefore, in the present study, employees who performed virtual work 75% or more of the time may have had less work-family conflict than employees performing virtual work 25% or less of the time, which may have helped lead to higher job satisfaction.

The present study also found that the perceived supervisor support of virtual workers who spent 75% or more of their work time working virtually was higher than the perceived supervisor support of those who spent 25% or less of their work time working virtually. This finding appears to be in opposition to Pyöriä's (2011) claim that an outcome of virtual work is a sense of isolation and Wheatley's (2012) finding that due to their working arrangements, virtual workers may experience isolation that results in a reduced degree of perceived social support from work sources. Also, the present study's finding in regard to perceived supervisor support for virtual workers who spent more time doing virtual work varies from a finding by Sardeshmukh et al. (2012), in which researchers found a negative correlation between weekly hours spent doing virtual work

and the workers' perceived organizational support from supervisors and coworkers. The present study's finding in relation to perceived supervisor support also appears to vary from Bartel et al.'s (2012) finding that amount of weekly time virtual workers worked in isolated environments was negatively associated with decreased perceived respect from the organization and decreased organizational identification.

One reason the present study's findings differed from those of Bartel et al. (2012), Sardeshmukh et al. (2012), and Wheatley et al. (2012) may be that virtual workers in the present study who performed virtual work 75% or more of the time may not have experienced a greater sense of isolation than those who spent a lower percentage of time working virtually. For instance, managers in the five companies at which participants worked may have instituted policies and practices to help forestall any sense of isolation that might result from doing virtual work. However, this study did not investigate the virtual working arrangements of workers or the degree to which they may have experienced a sense of isolation while doing virtual work. Thus, it is impossible to determine the relative strength of the sense of isolation of virtual workers who spent most of their time doing virtual work in comparison to those who spent one-quarter or less of their time doing virtual work.

The present study also found that organizational commitment of virtual workers was higher for those who spent 75% or more of their work time working virtually than for those who spent 25% or less of their work time working virtually. These results cannot be directly compared to any of the reviewed studies because none of those studies investigated the relationship of amount or percent of time performing virtual work with

employees' organizational commitment. However, the results are consistent with the findings of Burman and Shastri (2013), Martin and MacDonnell (2012), and Sanchuli et al. (2014) that working virtually was positively associated with employees' organizational commitment.

The researchers suggested that neither age nor gender moderated any of the relationships found between the independent variable and the dependent variables. There have been few prior studies focusing on how age or gender are related to virtual work, and no studies were located that examined age and gender in relation to amount or percentage of time doing virtual work. However, the present study's finding in regard to age not being associated with any of the relationships between variables appears to be contrary to the finding by Martin and MacDonnell (2012) that employee age weakened a positive association of virtual work with organizational commitment. In explanation of their finding, Martin and MacDonnell (2012) suggested the possibility that virtual work might be more attractive for younger than for older workers. However, the findings of the present study indicate that the beneficial results in terms of increased job satisfaction, organizational commitment, and perceived organizational support are the same for both younger and older virtual workers who spent at least 75% of their work time performing virtual work.

The theoretical framework for the present study was social presence, which refers to an individual's sense of being with others in a technologically mediated environment (Biocca et al., 2003). Having a reduced sense of social presence may increase a virtual worker's perception of being isolated from other workers and managers in his or her

organization and may lead to reduced job satisfaction and organizational commitment (Cascio, 2000). Reduced social presence leading to a sense of isolation may also reduce virtual workers' perceptions of organizational support at (Bartel et al., 2012; Bentley et al., 2016; Brunelle, 2013; Sardeshmukh et al., 2012). Fonner and Roloff (2012) found that virtual workers' sense of the amount of social presence was positively related to their organizational identification.

The findings of the present study suggest that working 75% or more of their time virtually did not substantially decrease the virtual workers' sense of social presence or increase their sense of isolation from others compared to virtual workers who worked virtually 25% or less of their time. This is in alignment with Fonner and Roloff's (2012) conclusion that doing virtual work remotely does not necessarily impair workers' sense of social presence. If workers who spent a larger percentage of their time working virtually did not have a decreased sense of social presence, this might have been due to their use of communication strategies to reduce their perception of distance from coworkers (Leonardi et al., 2010). It is also possible that employees in this study who worked a higher percentage of time virtually had a reduced sense of social presence but that any resulting adverse effects were canceled out by an increased sense of autonomy (Brunelle, 2012; Gajendran & Harrison, 2007; Hunton & Norman, 2010; Hornung & Glaser, 2009) or by their perception that working virtually increased their productivity (Leonardi et al., 2010). Because there was no measure of social presence in the present study, it is impossible to determine whether virtual workers who worked virtually three-

quarters or more of their time had a similar, decreased, or even greater sense of social presence than those who worked a lesser percentage of the time virtually.

Limitations of the Study

There were several limitations to this study. One limitation was that the study was restricted to investigating the relationship of variables for virtual workers who were employed by a large privately owned organization. It did not include virtual workers who were self-employed as the dependent variables of job satisfaction, organizational commitment, perceived supervisor support, and perceived coworker support was mainly pertinent to virtual workers who are employees of an organization. It also did not include virtual workers who were employed by governmental organizations, nonprofit organizations, small privately owned companies, or public companies.

A second limitation of the study was that the sample was a purposive sample of virtual workers in five companies and not a random sample of all full- and part-time virtual workers in the United States. This limitation was made because identifying all full-time, and part-time virtual workers in the United States who work for a large privately owned company was unfeasible both financially and technically. Due to this limitation, results of the study cannot be generalized to the larger population of virtual workers in large, privately owned companies, and the results can only be suggestive (Heckman, 2010).

A third limitation was that several variables that might affect the responses of participants were not be measured. Examples of such variables were the distance a participant was located from his or her central office, the nature of the location or

locations at which a participant performed virtual work, and companies' policies concerning virtual workers. This limitation was made due to the need to limit the complexity of the research and the size of the necessary sample. It was assumed that the potential effects of such variables would cancel out in the sample.

A fourth limitation was that several constructs were not measured that may have helped in understanding what factors contributed to results. These included participants' sense of social presence or isolation, how the percentage of time doing virtual work was related to their perceived work-life conflict, how doing virtual work was related to participants' sense of autonomy, and their reasons for liking or disliking virtual work. Determining any or all of these factors could have added in understanding the results of the study.

A fifth limitation was that the study was correlational. Finding a statistical correlation between variables cannot be assumed to be due to the causal relationship between the measured construct (Campbell & Stanley, 1963). Even though it was found that workers who spent 75% or more of their work time performing virtual work has significantly higher job satisfaction, organizational commitment, and perceived supervisor support than those who spent 25% or less of their time working virtually, it cannot be concluded that these outcomes were caused by their performing virtual work a higher percentage of time.

Recommendations

Several recommendations for further research can be made on the basis of this study. It is first recommended that the study be repeated with a new sample of virtual

workers from large privately-owned companies within the United States to confirm the results of the present study. While this study had the minimum number of participants needed for the various statistical procedures used, it is suggested that future studies of this nature seek a more significant number of virtual worker participants.

Second, it is recommended that the present study is repeated with samples of virtual workers from governmental organizations, nonprofit organizations, small and medium private companies, and publicly held companies. This is important because there may be relevant differences in how the percentage of time spent performing virtual work is related to job satisfaction, organizational commitment, and supervisor and coworker support depending on the type of company that employs the virtual workers.

Third, it is recommended that studies be conducted to measure factors that may help moderate how the percentage of time working virtually relates to virtual workers' job satisfaction and other organizational outcomes. Such factors include how perceived social presence, sense of isolation, perceived autonomy, and perceived work-family conflict might vary among virtual workers depending on the percentage of time spent performing virtual work.

Fourth, it is recommended that further studies be performed to determine how the demographic variables of gender and age are related to virtual workers' job satisfaction and other important organizational outcomes. Even after the present study, there continues to be a dearth of research on how gender and age may impact virtual workers' perceptions of their jobs and organizations. It is especially recommended that such

studies include a measure of amount or percentage of time the participants perform virtual work.

Implications

The study results have implications for social change for organizations, employees, and society as a whole. First, in regard to organizations, the findings that virtual workers who spent 75% or more of their work time doing virtual work had several improved positive organizational outcomes compared to workers who spent 25% or less time working virtually suggest that the perceived benefits to employees of working virtually increase as their virtual work time increases. This information is potentially useful to virtual work managers and their organizations because it suggests benefits to both employees and the organization from creating work positions that are wholly or almost entirely virtual. Study results especially suggest that creating such work positions may be beneficial to large, privately owned organizations, which were the type of organizations at which participants did virtual work in this study.

The study also has implications for social change for employees. At a time when an increasing number of jobs entail some degree of virtual work, the results of this study suggest that for many employees, working virtually has benefits that may increase as the time spent working virtually increases. Whether it is due to increased autonomy, improved efficiency, better balance between work and family, some combination of these, or some other benefits, the study found that workers who spent three-quarters of their time or more performing virtual work were more satisfied with their jobs than those who spent one-quarter or less of their time performing virtual work. This finding is good

news for employees who are transitioning or will transition from a lower to a higher percentage of virtual work time, as the study suggests that this transition may increase employee job satisfaction.

Finally, the study has implications for social change for society as a whole as virtual work becomes increasingly prevalent in society (Boel et al., 2016; Maruyama & Tietze, 2012). This increasing prevalence can be expected to result in an increase in the number of employees who work virtually all or most of their work time. The results of this study, along with the results of several other studies previously cited, suggest that this increasing amount of time performing virtual work will add to the job satisfaction of potentially millions of employees, which may also add to their and their families' quality of life. Also, insofar as virtual work may be more economically efficient than traditional office-centered work, the study's findings imply that by assigning more employees to a high percentage of virtual work, organizations will provide benefits not only to themselves and their employees but also to the U.S. economy.

Based on the findings of the study, it is suggested that organizations consider judiciously increasing the percentage of time virtual workers spend doing virtual work, as doing so may provide benefits for both the organization and virtual employees. However, it is also suggested that any organization that does increase the percentage of time employees perform virtual work on the basis of this study should monitor the effects of those increases. The results of increased time spent working virtually might be monitored by undertaking internal surveys of the workers to determine how the added virtual work time is related to their job satisfaction, organizational commitment, and perceived

organizational support. The workers' perceived social presence and perceived isolation should also be monitored so that remedies can be developed to increase the sense of social presence and reduce perceived isolation for virtual workers if necessary.

Conclusion

The purpose of this study was to help fill two gaps in the literature regarding important organizational outcomes associated with employees who perform virtual work. The first gap was regarding the amount or percentage of the work time employees spend performing virtual work and important organizational outcomes, an issue investigated by only a few previous studies. Using a sample constructed of virtual workers who worked in one of five different large, privately owned companies, the results of the study showed that virtual workers who spent 75% or more of their time doing virtual work have higher job satisfaction, organizational commitment, and perceived supervisor support compared to virtual workers who spent 25% or less of their time doing virtual work.

The second gap in the literature was in regard to how age or gender moderated any association of amount or percentage of time performing virtual work and virtual employees' job satisfaction, organizational commitment, and perceived supervisor and coworker support, an issue investigated by even fewer studies than the first gap. Using the same sample of virtual workers who worked in one of five different large, privately owned companies, the results of this study showed that neither age nor gender moderated any of the relationships found between the percentage of time performing virtual work and organizational outcomes.

A significant take-home message of this study is that several critical organizational outcomes of employees working virtually—job satisfaction, organizational commitment, and perceived supervisor support—were not limited by the percentage of their work time the employees spend work virtually. Instead, those employees who spent 75% or more of their work time working virtually had higher job satisfaction, organizational commitment, and perceived supervisor support than employees who spent 25% or less of their work time working virtually. Furthermore, neither age nor gender moderated these relationships. These findings suggest that the benefits of working virtually increase with the time spent doing so.

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Appendix A: Demographic Questionnaire

1. Please click the circle to indicate how many hours per week you spend working virtually.

35 hours or more

Less than 35 hours

2. What percent of your weekly work time do you spend working virtually?

25% or less

25 to 50%

51 to 75%

76 to 100%

3. Please indicate your age range.

18 to 30

31 to 45

46 to 60

Over 60

4. Please indicate your gender.

Female

Male

Appendix B: Job Satisfaction Scale

(Ellwardt, Labianca, & Wittek, 2012)

1. How satisfied are you with your tasks?
2. How satisfied are you with your salary?
3. How satisfied are you with the collaboration with your colleagues?
4. How satisfied are you with your workload?

Note: Items scored on a seven-point Likert scale from very dissatisfied to very satisfied.

Appendix C: Organizational Commitment Questionnaire

(Mowday, Steers, & Porter, 1979)

1. I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.
2. I talk up this organization to my friends as a great organization to work for.
3. I feel very little loyalty to this organization. (R)*
4. I would accept almost any type of job assignment in order to keep working for this organization.
5. I find that my values and the organization's values are very similar.
6. I am proud to tell others that I am part of this organization.
7. I could just as well be working for a different organization as long as the type of work were similar. (R)
8. This organization really inspires the very best in me in the way of job performance.
9. It would take very little change in my present circumstances to cause me to leave this organization. (R)
10. I am extremely glad that I chose this organization to work for, over others I was considering at the time I joined.
11. There's not too much to be gained by sticking with this organization indefinitely. (R)
12. Often, I find it difficult to agree with this organization's policies on important matters relating to its employees. (R)
13. I really care about the fate of this organization.
14. For me this is the best of all possible organizations for which to work.
15. Deciding to work for this organization was a definite mistake on my Part. (R)

Note: Items scored on a seven-point Likert scale from strongly agree to strongly disagree.

*(R) indicates item is reverse-scored.

Appendix D: Survey of Perceived Supervisor Support

(Kottke & Sharafinski, 1988)

1. My supervisor values my contributions to the well-being of our department.
2. If my supervisor could hire someone to replace me at a lower salary he/she would do so. (R)*
3. My supervisor appreciates extra effort from me.
4. My supervisor strongly considers my goals and values.
5. My supervisor wants to know if I have any complaints.
6. My supervisor takes my best interests into account when he/she makes decisions that affect me.
7. Help is available from my supervisor when I have a problem.
8. My supervisor really cares about my well-being.
9. If I did my best job possible, my supervisor would be sure to notice.
10. My supervisor is willing to help when I need a special favor.
11. My supervisor cares about my general satisfaction at work.
12. If given the opportunity my supervisor would take advantage of me. (R)
13. My supervisor shows a lot of concern for me.
14. My supervisor cares about my opinions.
15. My supervisor takes pride in my accomplishments.
16. My supervisor tries to make my job as interesting as possible.

Note: Items scored on a seven-point scale from strongly agree to strongly disagree.

*(R) Indicates item is reverse-scored.

Appendix E: Perceived Coworker Support Scale

(Ladd & Henry, 2000)

1. My coworkers are supportive of my goals and values.
2. Help is available from my coworkers when I have a problem.
3. My coworkers really care about my well-being.
4. My coworkers are willing to offer assistance to help me perform my job to the best of my ability.
5. Even if I did the best job possible, my coworkers would fail to notice. (R)*
6. My coworkers care about my general satisfaction at work.
7. My coworkers show very little concern for me. (R)
8. My coworkers care about my opinions.
9. My coworkers are complimentary of my accomplishments at work.

Note: Items scored on a seven-point Likert scale from strongly disagree to strongly agree.

*(R) indicates the item is reverse-scored.

Appendix F: Permission to use the Job Satisfaction Scale

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Appendix H: Permission to use the Survey of Perceived Supervisor Support

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Appendix I: Permission to use the Perceived Coworker Support Scale

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