An Analysis of the Effects of Family Responsibility and Teleworking Volume on Satisfaction with Teleworking in the United States Federal Government

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Public Administration

School of Public and International Affairs

University of Baltimore
Baltimore, Maryland

April 2015

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A Dissertation

Submitted to
Yale Gordon College of Liberal Arts
University of Baltimore
in partial fulfillment of the requirements for the degree of

Doctor of Public Administration

by

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April 2015

ACKNOWLEDGMENTS

I would like to express my special thanks to Dr. Lenneal J. Henderson, my dissertation chair, for his overwhelming encouragement, support, motivation, guidance, and contributions throughout the entire process of my dissertation work. Also, I would like to give special thanks to Drs. Ed Gibson and Heather Wyatt-Nichol for their excellent support, assistance, comments, and directions toward the research.

I would also like to extend my greatest thanks to my grandmother, Myeong Ok Park, father, Jae Cheon Sa, mother, Young Sun Hong, father-in-law, Sae Hyun Jang, mother-in-law, Mi Sook Lee, younger brother, Yong Jae Sa, sister-in-law, Hyun Joo Kim, and brother-in-law, Ki Bum Jang. My doctorate and academic success could not have been achieved without their constant encouragement, valuable support, and endless love.

More important of all, my greatest and deepest appreciation goes to my wife, Mi Jang. She has been an excellent and sincere supporter and has unconditionally loved me during my good and bad times. Mi was always there cheering me up through all of the troubles and difficulties of the dissertation process and my whole academic journey. Finally, I also would like to express my special love to our adorable and precious son, Benjamin Sa. I love you with all my heart.

ABSTRACT

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Yongjin Sa

This dissertation primarily aims to provide a better understanding of the factors that influence teleworkers' satisfaction with teleworking in United States federal agencies. Specifically, this study empirically tests and examines how and the extent to which federal government teleworkers' family responsibilities (i.e., child and elder care obligations), satisfaction levels with the dependent care programs provided by their organizations, and teleworking volume (frequency) are associated with their teleworking satisfaction levels.

This study utilizes the 2011 Federal Employee Viewpoint Survey published by the Office of Personnel Management to address the hypotheses and research questions. The respondents are U.S. federal employees who are full-time, permanent employees of all 29 departments and large agencies represented in the President Management Council and 54 small and independent agencies. The dependent variable in this study is a federal employee's satisfaction with teleworking. The independent variables include an employee's child and elder care responsibility, level of satisfaction with the child and elder care program, and volume (frequency) of telework. In addition, this study examines respondents' demographic factors and characteristics as its control variables. These variables include gender, age, supervisory status, years of tenure in the federal government and current agency, and work location. This study also includes several organizational factors or constraints that may influence the dependent variable of an employee's teleworking satisfaction level. To examine the hypotheses and research questions, this study employs both ordered probit analysis and ordinary least squares regression.

The empirical findings are summarized below. First, regarding the association between a teleworker's family responsibilities and her or his satisfaction with teleworking, the empirical findings of this study confirm that federal teleworkers who have child and elder care obligations exhibit lower levels of teleworking satisfaction than do the teleworkers who do not have such obligations. Second, with respect to the relationship between a teleworker's level of satisfaction with the dependent care programs provided by her or his organization and teleworking satisfaction, this study finds that the federal teleworkers with higher levels of satisfaction with their child and

elder care programs report higher levels of teleworking satisfaction. Third, regarding the link between a teleworker's satisfaction with teleworking and the volume (frequency) of teleworking, the empirical results show that federal teleworkers who telework 1 or 2 days per week report higher levels of teleworking satisfaction compared with teleworkers who telework 1 or 2 days per month and teleworkers who telework very infrequently on an unscheduled or short-term basis. However, teleworkers who telework 1 or 2 days per week exhibit lower levels of satisfaction with teleworking than the teleworkers who telework 3 or more days per week.

In conclusion, this study contributes to the teleworking and family-friendly policy literature in the public sector with the theoretical, methodological, and managerial implications. Several limitations that must be noted and that future research should address and some influential suggestions for future research that can contribute to the development of the body of teleworking scholarship are also discussed.

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CHAPTER 1

Introduction

Purpose and Research Question

This dissertation aims to provide a better understanding of factors that influence teleworkers' satisfaction with teleworking in all United States federal agencies. From the multiple family-friendly policies that U.S. federal agencies provide, this study primarily focuses on teleworking, which allows employees to "periodically, regularly, or exclusively perform work for their employers from home or another remote location that is equipped with the appropriate computer based technology to transfer work to the central organization" (Hunton & Norman, 2010, p. 67; Caillier, 2013). Based on a comprehensive literature review, the following research question guided this study: How and to what extent do teleworkers' family responsibilities (i.e., child and elder care), satisfaction with the dependent care programs provided the organization (i.e., child and elder care programs), and volume (frequency) of teleworking influence teleworkers' satisfaction levels with teleworking in the public sector?

Research Background

The nature of the contemporary workforce in the federal government has dramatically changed (Moon & Roh, 2010) as indicated by demographic shifts and changes (viz., the increased number of non-traditional employees, such as the increase in the number and rankings of women, dual-wage earners, single parents, and middle-aged employees) (Newman & Mathews, 1999; Saltzstein, Ting & Saltzstein, 2001; Moon & Roh, 2010). These groups of workers are more likely to suffer from work-family conflicts

(i.e., imbalances between work and family responsibilities) and seek to maintain balance among the conflicting demands of their developing career, their personal lives, and their responsibilities toward their families (Lee & Hong, 2011; Perry-Smith & Blum, 2000). In this context, as a class of employer, the government needs to support family-friendly policies to successfully recruit and retain competent employees who have to balance the strong demands from work and their family lives (Cayer, 2003; Hoyman & Duer, 2004; Saltzstein et al., 2001).

As part of an effort to respond practically to these types of needs, especially for female employees, family-friendly policies are "a necessary first step to improve the goodness of fit between the lives of women and the workplace experience" (Newman & Mathews, 1999, p. 35). Specifically, family-friendly workplace policies can be defined as "arrangements designed to support employees faced with balancing the competing demands of work and family in today's fast-paced, complex environment" (Newman & Mathews, 1999, p. 35; Reno, 1993).

Lee and Hong (2011) note that the literature on family-friendly policies as a whole has discussed how such policies are able to benefit both employees (e.g., by offering employees work-related flexibility in terms of time spent at work, their place of work, and the method of working; by strengthening employees' beliefs about their organizations' special support for work and family demands) (Julien, Somerville & Culp, 2011; Newman & Mathews, 1999; Perry-Smith & Blum, 2000) and employers (e.g., by enhancing organizational performance; by enhancing employees' organizational commitment and job satisfaction; by reducing employees' intentions to leave) (Rogers & Rodgers, 1989; Julien et al., 2011; Pfeffer, 1994; Mumford & Budd, 2006).

The telework program is a sub-category of alternative work schedules (AWSs), which are intended to provide employees with more flexible work arrangements, moving away from the traditional 8:00 a.m. to 4:30 p.m., Monday through Friday work schedule (Caillier, 2012; Julien et al., 2011). Such alternative work schedules or arrangements include teleworking, a compressed work week, job sharing, and flextime. The AWSs programs typically are intended to promote the flexibility and autonomy of an employee to control her or his time and place for performing job duties (i.e., when and where to work) and to support the employee's work-life balance.

As the popularity of teleworking has risen steadily (Caillier, 2012), the percentage of employees who telework (regularly or irregularly; frequently or infrequently) in U.S. federal agencies has also increased. According to the 2010 and 2012 Federal Employee Viewpoint Surveys (FEVSs) published by the U.S. Office of Personnel Management (OPM), the percentage of federal employees who teleworked on a regular basis (i.e., who teleworked at least one entire work day per week) increased from 9.7% in 2010 to 10.3% in 2012. In addition, the percentage of employees who teleworked infrequently or irregularly (i.e., who teleworked no more than 1 or 2 days per month or who teleworked on an unscheduled or short-term basis) also increased from 11.6% in 2010 to 13.4% in 2012.

The increased number of federal government teleworkers can be attributed to the fundamental assumption that both public managers and employees are able to benefit from teleworking in public sectors. Specifically, in terms of federal managers' perspectives, OPM (2011) stated that the implementation of telework programs plays a significant role in enhancing management effectiveness (e.g., reduction in employee

turnover, transit costs, management costs for offices and real estate), supporting an employee's work-family balance, and recruiting and retaining competent employees, especially with respect to the non-traditional workers noted above. Furthermore, in terms of employees' perspectives, teleworking helps to reduce an employee's costs and the stress caused by commuting every workday, thereby improving an employee's organizational commitment and job satisfaction, work performance as well as giving employees autonomy to perform their job duties. Those benefits tend to strengthen employees' perceptions that they are treated well and are appropriately supported by their organizations (OPM, 2011).

Finally, from a societal perspective, the implementation of teleworking can benefit the whole society by reducing energy consumption, forestalling environmental pollution, and decreasing the need for constructing and maintaining infrastructure, including offices and roads (OPM, 2011; Caillier, 2012). More importantly, teleworking plays a vital role in continuing the government's functions and operations, and citizens are able to receive public services even during national emergencies, such as natural disasters and other security incidents (OPM, 2011; Mello, 2007). In this way, teleworking can benefit individual employees, managers, organizations, and society.

Focus and Perspective of the Study

First, this study primarily focuses on teleworking programs and public employees' teleworking satisfaction levels in the federal government rather than other levels of state and local government. Previous studies of teleworking have focused on the impact of teleworking on several outcomes, including performance (e.g., Major, Verive

& Joice, 2008; Lee & Hong, 2011; Saltzstein et al., 2001; Christensen, 1988; Kossek, Lautsch & Eaton, 2005; Metzger & Von Glinow, 1988), job satisfaction (e.g., Caillier, 2012; Golden, 2006; Scandura & Lankau, 1997; Cooper & Kurland, 2002; Dubrin, 1991; Feldman & Gainey, 1997; Saltzstein et al., 2001), turnover intention (e.g., Caillier, 2013; Lee & Hong, 2011; Kossek et al., 2005), organizational commitment (e.g., Scandura & Lankau, 1997; Crooker & Grover, 1993), and work-family or work-life balance (e.g., Maruyama, Hopkinson & James, 2009; Julien et al., 2011; Baruch, 2000; Tietze & Musson, 2005; Saltzstein et al., 2001).

From the promised outcomes of teleworking, this study focuses entirely on a teleworker's satisfaction with teleworking itself. Most of the research studying the link between teleworking and job satisfaction has explored how and the extent to which teleworking implementation influences an employee's overall job satisfaction. Beyond the context of a teleworker's overall job satisfaction, however, very few studies have focused particularly on a teleworker's satisfaction with the teleworking arrangement itself. Thus, very few studies have empirically tested the factors that affect the teleworking satisfaction level in public sectors, although the extant teleworking studies have examined a teleworker's overall job satisfaction as one of the outcomes of teleworking program implementation in a broad sense. As a result, public managers, practitioners and public administration scholars do not have data regarding the factors that may be associated with federal teleworkers' satisfaction levels with teleworking because such associations have not been empirically examined in public organizations.

In particular, this line of research has produced very few public management studies on teleworking or family-friendly policies that have sought to empirically

examine the effects of federal government teleworkers' family responsibilities (i.e., child and elder care obligations), satisfaction levels with the dependent care programs provided by their organizations, and teleworking volume (frequency) on their teleworking satisfaction levels. In this context, the research question noted earlier are fundamentally driven by the purpose of addressing the theoretical and empirical gaps that remain to be examined in the scholarship on teleworking in the public sector; these questions also formulate the hypotheses of this study.

Time Frame of the Research

Teleworking was first designed and implemented in the 1970s as a strategy to address the oil and energy crisis; however, it did not gain much popularity with employees or employers and was not widely implemented until the early 1990s due to technical barriers (such as lack of technical support and inappropriate computer-based technology) and less support for telework programs by employees and employers (Bailey & Kurland, 2002; OPM, 2011; Caillier, 2013). However, according to the U.S. federal government and pursuant to Congress' efforts to pass several laws (e.g., the Department of Transportation and Related Agencies Appropriations Act of 1993, the Telework Enhancement Act of 2010), federal government employees have substantially participated in the telework program since the 1990s (OPM, 2011; GAO, 2003; Caillier, 2012). In this context, this study will primarily focus on the teleworking and family-friendly policy literature in the public sector from the last two decades to examine the research questions and hypotheses.

Organization of the Dissertation

This dissertation will proceed as follows: Chapter 2, Literature Review will discuss the background of family-friendly policies, the definition and background of teleworking, legislative actions on teleworking, social exchange theory, the relationship between telework, job satisfaction and work-family balance, and hypothesized factors such as teleworkers' family care obligations, their satisfaction level with the dependent care programs provided by their agencies, and their volume (frequency) of teleworking that positively or negatively correlate with teleworkers' satisfaction levels. Chapter 3, Research Methodology will describe the research question and hypotheses in this study, the data source, the sample used in the study, the methodological contributions, the variables and measurement, the research methodology and the data-analysis strategy, and the model specifications for the analysis. Chapter 4, Statistical Results & Findings will analyze descriptive statistics of the sample, distribution of the sample by demographics, distribution of the participants' responses for teleworking satisfaction, statistical analysis and findings, and results of hypotheses tests. Finally, Chapter 5, Conclusions & Discussion will include a summary of the empirical findings of this study, implications of the findings and the study, limitations of the study, and suggestions for future research.

Summary of Chapter One

As discussed above, the main purpose of this study is to contribute to the teleworking and family-friendly policy literature on the public sector by providing a better understanding regarding the factors that influence teleworkers' satisfaction with teleworking in United States federal agencies. To formulate and reinforce the research

question and hypotheses of this study, the following chapter will include a critical discussion based on a comprehensive review of the teleworking literature of the development, primary functions, concerns, and implications of teleworking as well as how a telework employee's dependent care obligations (i.e., family responsibilities), satisfaction with dependent support programs, and teleworking volume (frequency) are associated with her or his satisfaction with teleworking in public sectors.

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of this chapter is to review and assess the key theoretical orientations and discourse and empirical evidence relevant to teleworking and job satisfaction. This assessment facilitates the formulation of the research question and hypotheses of this study. With respect to the criteria used for selecting specific works from the whole body of the teleworking literature, the background of family-friendly policies and teleworking will first be discussed. Then, this chapter will identify a key discussion on social exchange theory, which has been used as the principal theoretical framework for explaining the link between teleworking and teleworkers' job satisfaction in the public sector. In addition, an extensive discussion of the empirical findings pertaining to a teleworker's satisfaction with teleworking will be provided. In particular, this chapter will discuss how and to what extent a teleworker's family responsibilities, satisfaction with dependent care programs, and volume of teleworking influence her or his satisfaction levels with teleworking in the public sector based on the extant teleworking literature. This chapter will also pay attention to the various methodologies, data samples, and model specifications the selected literature utilized to support their findings, observations, and analyses.

Definition and Background of Teleworking

The Telework Enhancement Act of 2011 (Public Law 111-292) provided the official definition of telework: "the term 'telework' or 'teleworking' refers to a work

flexibility arrangement under which an employee performs the duties and responsibilities of such employee's position, and other authorized activities, from an approved worksite other than the location from which the employee would otherwise work" (OPM, 2011). In practice, teleworking allows employees to work all or part of their hours at any approved alternative workplaces (e.g., employee residences, regional satellite facilities, any remote locations) other than their traditional offices, through the use of communications and computer-based technologies (Hunton & Norman, 2010; Caillier, 2012; Mello, 2007; Whittle & Mueller, 2009).

When teleworking, employees can perform their job duties from virtually anywhere, with allowed flexibility "to choose when and where to work as well as the ability to better manage their work and family obligations" (Caillier, 2013, p. 74). From an organizational or employer perspective, the implementation of teleworking indicates "a shift from managing by observation to managing by results" (GAO, 2003, p. 48) that also requires employers' willingness to change their traditional management systems for promoting telework programs in the public sector. Ultimately, teleworking and its implementation can contribute to the construction of a results-based (or output-oriented) organizational culture and management strategy in the public sector (OPM, 2011).

The Literature on Family-Friendly Policies

Family-friendly policies have been designed and implemented to maintain and balance an employee's competing demands between her or his work duties and family responsibilities, thereby reflecting an issue of human capital management (Lee & Hong, 2011; Newman & Mathews, 1999; Moon & Roh, 2010). Adopting a similar concept of

family-friendly policy, the 2011 FEVS (OPM, 2011) used the term "work/life program" to describe a program that supports an employee's maintenance of the balance between work and life (family) demands. Specifically, as part of an effort to enhance the implementation of work/life programs, the survey measured federal employees' satisfaction with several types of work/life programs that are currently implemented in federal agencies—telework, alternative work schedules, health and wellness programs, employee assistance programs, child-care programs, and elder-care programs (OPM, 2011).

With regard to a typology of workplace policies, Hoyman and Duer (1994) proposed the term "worker-friendly policies," which conceptually includes all dimensions of workplace policies as a broader range of family-friendly policies. They provided four distinct types of worker-friendly policies according to the following criteria, drawing from the focus, goals, and target group of the policies: 1) "family or personal policies" (e.g., maternity leave, child care, paid vacation, family medical, flexible use of sick days); 2) "removing impediments to work" (e.g., teleworking, flextime, telecommuting); 3) "training and education policies" (e.g., skill acquisition, higher education); and 4) "nontraditional incentives" (e.g., company care, awards, gyms, parking prizes) (p. 117).

Specifically, Newman and Mathews (1999) and Cayer (2003) illustrated what types of family-friendly workplace policies are currently implemented within U.S. federal cabinet-level departments and described the scopes and foci of each of the policies (e.g., alternative work schedule, telecommuting, job sharing, part-time employment, dependent care counseling and referral services, leave for parental and family responsibilities, employee assistance programs) (Newman & Mathews, 1999, p. 38-39). From these types

of family-friendly policies, this study primarily focuses on teleworking arrangement in U.S. federal agencies.

Legislative Actions for Teleworking

As a part of its efforts in human capital management, the U.S. Congress has continued to support the implementation of telework programs in federal agencies and to encourage government employees' positive use and participation through a number of legislative actions and public laws (GAO, 2008; Caillier, 2013; OPM, 2011). The legislative mandate for telework in the current executive branch of the federal government (Public Law 106-346) was initially passed in 2000 (GAO, 2008), stating that "each executive agency shall establish a policy under which eligible employees of the agency may participate in telecommuting to the maximum extent possible without diminished employee performance" (OPM, 2011, p. 2). The law also assigned the leading roles and duties relevant to the implementation of teleworking (e.g., the provision of guidelines and resources for telework programs and the management of its implementation in the federal government) to two federal agencies: the General Services Administration (GSA) and the Office of Personnel Management (OPM) (Caillier, 2012; OPM, 2011).

A decade later, Congress passed the Telework Enhancement Act of 2010 (Public Law 111-292), which specified the "roles, responsibilities and expectations for all federal executive agencies with regard to telework policies; employee eligibility and participation; program implementation; and reporting" (OPM, 2011, p. 3) in detail. One distinct point of the Act was to require every federal executive agency to designate a

Telework Managing Officer (TMO), who is a senior-level official at each agency and who has the primary responsibility for developing and implementing the telework program in her or his agency (OPM, 2011). By designating a single and accountable position in each agency as the TOM, the OPM can directly and effectively contact the TOM regarding issues about the agency's telework program (OPM, 2011 & 2013).

The Telework Enhancement Act of 2010 also assigned specific responsibilities and functions regarding telework program management to the OPM, GSA, Office of Management and Budget (OMB), and Department of Homeland Security (DHS), including the Federal Emergency Management Agency (FEMA) and the National Archives and Records Administration (NARA) (OPM, 2011). As a leading federal agency given the responsibility for collaborating with other federal agencies on telecommuting programs, the OPM takes responsibility for consulting policy guidance, rules, operations, and other management issues on telework implementation for each of the federal agencies as well as providing consultation on telework policy to the GSA in the areas of "telework centers, travel, technology, equipment and dependent care", FEMA in the areas of "continuation of operations and long-term emergencies", and NARA in the areas of "efficient and effective records management and preservation of records, including Presidential and Vice-Presidential records" (OPM, 2011, p. 8).

Furthermore, the Telework Enhancement Act of 2010 required the OPM to compile and provide annual reports to Congress. These reports identify the status of telework in the federal government in terms of the outcomes, effects, employees' participation and perceptions, and other management issues associated with the implementation of the telework program (OPM, 2013).

Social Exchange Theory

Relatively few studies on teleworking arrangements or family-friendly policies have tried to address the promised benefits of teleworking in governments, even as the number of teleworkers in public sectors has gradually increased to the point that teleworking has become the most common type of AWS (Caillier, 2013; OPM, 2011). In particular, because public management research has not yet provided empirical evidence regarding how and to what extent teleworking benefits an organization and its employees, little is known about whether the beneficial and expected policy outcomes of the implementation of teleworking suggested by public managers and scholars are really true in the public sector.

To explore the links between telework and both job satisfaction and work-family balance, the family-friendly policies literature has used social exchange theory (e.g., Caillier 2012 & 2013; Lee & Hong, 2010; Julien et al., 2010; Gould-Williams, 2005), which is derived from public choice theory (Anderfuhren-Biget, Simon, Varone, Giauque & Ritz, 2010) and the norm of reciprocity (Blau, 1964; Aryee, Budhwar & Chen, 2002). In regard to the primary logic of social exchange theory, Settoon, Bennett, and Liden (1996, p. 219) have asserted that "positive, beneficial actions directed at employees by the organization and/or its representatives contribute to the establishment of high quality exchange relationships that create obligations for employees to reciprocate in positive, beneficial ways."

Along a similar vein, social exchange theory can be used to explain the employee-employer relationship (Gould-Williams, 2007; Noblet & Rodwell, 2009), as well as to understand why employees are likely to reciprocate the benefits or support they receive

from their employers or organizations (Lambert, 2000; Lee & Hong, 2010). From the employer's perspective, Gould-Williams and Davies (2005, p. 3) mentioned that social exchanges are voluntary actions (Blau, 1964) that are "initiated by an organization's treatment of its employees, with the expectation that such treatment will be eventually reciprocated." Hammer et al. (2005) and Scandura and Lankau (1997) noted that social exchange theory corresponds to a psychological contract, which is defined as a set of "individual beliefs, shaped by the organization, regarding terms of an exchange agreement between individuals and their organization" (Rousseau, 1995, p. 9).

Therefore, from the perspective of social exchange theory, employees who feel that they receive a higher level of support and benefits from their employers or organizations are more likely to reciprocate with more positive work attitudes and behaviors (Gould-Williams & Davies, 2005; Aryee et al., 2002). Those reciprocal actions can contribute to enhanced performance and commitment to the organizations and can promote an employee's job satisfaction and intention to remain (Caillier, 2013; Gould-Williams & Davies, 2005; Julien et al., 2010).

Among the various types of benefits and support offered by organizations, a telework program offered as a type of family-friendly policy designed to support an employee's work-family (life) balance is also explained by the norm of reciprocity (i.e., social exchange theory) (Bailey & Kurland, 2002; Martinez-Sanchez, Perez-Perez, de-Luis-Carnicer & Vela-Jimenez, 2007). Specifically, teleworkers who feel that their need for balance between work and family is well-supported and who perceive that their employers or organizations care about their family issues are more likely to reciprocate in

a beneficial manner through enhanced job performance, loyalty, morale, and commitment to the organization, accompanied by a high level of job satisfaction.

In contrast, an employer who provides less support for addressing an employee's work-family conflicts and demands may encounter a lower level of employee job satisfaction and performance and an elevated intention to leave (Kossek et al., 2006; Scandura & Lankau, 1997; Julien et al., 2010; Lee & Hong; 2010). These theoretical arguments are consistent with assertions about the reciprocal employee-employer relationship that are supported by several studies (e.g., Aryee et al., 2002; Settoon et al., 1996; Gould-Williams, 2007).

Teleworkers' Family Care Responsibilities and Teleworking Satisfaction Levels

As discussed earlier, the literature on teleworking and family-friendly policies has examined how and to what extent the implementation of teleworking programs affects organizational outcomes (e.g., employees' overall job satisfaction, work performance, organizational commitment, work motivation, intention to remain, and work-life balance). However, few studies have investigated the level of teleworkers' satisfaction with teleworking in public sectors. Accordingly, the extant teleworking literature has not provided empirical evidence regarding the significant factors that might influence a teleworker's satisfaction level with teleworking. This study primarily aims to address these theoretical and empirical gaps.

The level of job satisfaction represents the way an employee perceives the overall quality of the work environment in her or his organization (Baba & Jamal, 1991) as well as the employee's level of organizational commitment (OPM, 2013). The OPM (2013)

reported that teleworkers are more likely to report higher levels of job satisfaction and work performance (Gajendran & Harrison, 2007) and are less likely to report intentions to leave (Rust, Stewart, Miller & Pielack, 1996) than non-teleworkers. Organizational efforts for the adoption and implementation of telework programs can contribute to "positively [shaping] and [influencing] the building of overall organizational competence and, ultimately, organizational performance" (OPM, 2103, p. 60; Illegems & Verbeke, 2004).

Based on its annual report and an analysis of the status of telework in the federal government, the OPM (2013) found that the opportunity to participate in telework programs can provide an effective incentive for employees to improve their performance levels given that teleworkers are usually likely to maintain their teleworking arrangements to balance their work and life (family) responsibilities by demonstrating good performance and productivity. Furthermore, through several qualitative approaches (e.g., internal surveys, focus groups, and labor management forums in selected federal agencies), the OPM (2013) showed that federal employees who are not permitted to telework are likely to report lower levels of job satisfaction and organizational commitment than employees who participate in telework arrangements. Therefore, allowing and encouraging telework can allow an agency to improve its employees' positive attitudes, such as job satisfaction and intention to remain in a job (OPM, 2013).

According to social exchange theory, a variety of studies have discussed the relationships of telework with both teleworking satisfaction and work-family balance. Saltzstein et al. (2001) found that working at home (i.e., teleworking) is negatively linked to employees' satisfaction with work-family balance, whereas it has a positive influence

on their job satisfaction, according to an empirical analysis applied to U.S. federal government employees. However, more importantly, Saltzstein et al. (2001) concluded that the impact of teleworking on an employee's job satisfaction and work-family balance might be different "across groups of similarly situated individuals" (p. 463) depending on "the nature of the home working environment" (p. 463), including factors such as marital status, the number of children 13 years of age or younger, the presence of elder/older dependent adults, the spouse's employment situation, and other family-related characteristics.

Scandura and Lankau (1997) tried to explore the link between employees' perceptions of flexible work hours including teleworking arrangement and their job satisfaction and organizational commitment with its sample of 160 matched male and female managers in public and private organizations. They found that both male and female managers who perceive that their organizations provide flexible work hours report higher levels of job satisfaction and organizational commitment than employees who do not have the same perception.

The telework literature has discussed how teleworking supports or hinders teleworkers' job satisfaction or work-family (life) balances. According to the norm of reciprocity derived from social exchange theory, employees who are satisfied with a telework policy are more likely to perceive that their organizations give special support for both the employees' well-being and their family issues. As a result, they tend to exhibit willingness and feel an obligation to reciprocate for the benefits they obtain from their organizations. Those attitudes and behaviors result in increased employee performance, job satisfaction, and loyalty; such attitudes and behaviors also lead to

decreased employee turnover intentions (Caillier, 2013; Gould-Williams & Davies, 2005; Julien et al., 2010).

In a similar vein, telework provides its users with a certain degree of flexibility to manage the place and time for performing their job duties (Tremblay, 2002; Madsen, 2003; Sullivan & Lewis, 2001; Perrons, 2003; Casimir, 2001; Baruch, 2000; Duxbury, Higgins & Neufeld, 1998; Maruyama et al., 2009). The flexibility in terms of time contributes to a teleworker's balanced relationship between work and family or life by allowing employees to meet their family-related needs and activities during working day, thanks to their flexible work schedules (Tremblay, 2002; Madsen, 2003; Sullivan & Lewis, 2001; Perrons, 2003; Casimir, 2001).

In addition, the flexibility in terms of place enables teleworkers to save in terms of commute time and costs as well as to reduce stress caused by daily commutes between home and the office (Baruch, 2000; Duxbury et al., 1998; Maruyama et al., 2009). The commuting time and costs reduced by engaging in telework can be transformed into opportunities to spend more time supporting employees' diverse family needs, such as involvement in family-related activities, communication, family care, and household chores with family members (Tremblay, 2002; Baruch, 2000; Harpaz, 2002; Mirchandani, 1998).

However, according to the teleworking and family-friendly policy literature, teleworkers are likely to have difficulties efficiently managing and controlling time that is separately devoted to housework (e.g., family care responsibilities for child or elder dependents and household work) and job duties (Baines, 2002; Jackson, 1999; Tietze & Musson, 2005; Lee & Hong, 2011). In addition, due to a low level of concentration

caused by interruptions for dependent care obligations while working at home, it is often challenging for teleworkers to fully meet both family care demands and to effectively perform their job duties (Salaff, 2002; Maruyama et al., 2009). Therefore, a teleworker's dependent care responsibilities can be a particular obstacle to achieving a balance between work and family duties, and such family obligations can result in greater levels of work stress and dissatisfaction with teleworking (Saltzstein et al., 2001; Caillier, 2013; Julien et al., 2010).

Lee and Hong (2011) noted that working at home (i.e., teleworking) may be very challenging due to "the blurring of home and work boundaries" (p. 877). Specifically, teleworking at home is likely to be interrupted by family demands, such as children, elders, and household care responsibilities. Such interruptions can result in reduced levels of performance, job satisfaction, and work-life balance and increased levels of teleworkers' work and family stress (Lee & Hong, 2011; Metzger & Von Glinow, 1988). In particular, based on an empirical analysis using several types of survey data from U.S. federal government employees, the study found that teleworking was positively associated with a teleworker's intention to remain with her or his organization, whereas it had a negative relationship with agency performance. Although Lee & Hong (2011) did not directly analyze a teleworker's satisfaction with teleworking as a dependent variable in their model, the negative link between teleworking and agency performance found in the study was contrary to social exchange theory, and the result might be attributed to a teleworker's reduced job satisfaction because of an increased burden of dependent family care responsibilities (Saltzstein et al., 2001; Baruch, 2000; Kossek et al., 2005).

Although a teleworker may be able to spend more time addressing family responsibilities and demands due to reduced commuting times, the arrangement also makes it difficult for a teleworker to clearly and effectively divide time into work and non-work schedules. In addition, dependent care obligations for children and elder family members also tend to interrupt teleworkers while working at home, which results in obstacles to accomplishing both job duties and family responsibilities. Finally, a teleworker may suffer from work-life conflicts and a lower level of job satisfaction and performance, contrary to the positive expectations between teleworking and outcomes derived from social exchange theory. Based on survey data from 60 federal government organizations in Canada, Julien et al. (2011) referred to these conflicting attributes of teleworking as "a double-edged sword" (p. 191) that makes it difficult for teleworkers to control their work and family schedules due to the permeable boundary between their work duties and family care obligations or other non-work related tasks in the same place (Shamir & Salomon, 1985; Kossek et al., 2005).

Caillier (2012) empirically examined whether teleworkers perceive or experience a higher level of job satisfaction than do non-teleworkers based on U.S. federal government data. Specifically, he paid more attention to the reasons why employees do not telework and examined whether the difference in job satisfaction between teleworkers and non-teleworkers is also influenced by the reasons for not teleworking. Caillier (2012) found that only non-teleworkers who do not telework because they have not received approval from agencies perceive a lower level of job satisfaction than teleworkers. With respect to other reasons why employees do not telework (e.g., being physically present, technical problems, choosing not to telework), the empirical link mentioned previously—

that teleworkers have higher job satisfaction than non-teleworkers—was not supported in the model. Although the results of Caillier's (2012) study did not directly show that a teleworker's family care obligations reduce her or his teleworking satisfaction or work motivation, resulting in lower levels of job satisfaction for teleworkers than non-teleworkers, it is evident that his empirical findings did not support social exchange theory, which generally asserts a positive association between teleworking and job satisfaction.

According to the OPM's 2010, 2011, and 2012 FEVSs, the percentage of female employees (13.3 percent in 2012; 10.3 percent in 2011; and 12.1 percent in 2010) who teleworked on a regular basis (i.e., who telework at least one entire work day per week) was higher than that of male employees (7.9 percent in 2012; 6.2 percent in 2011; and 7.8 percent in 2010) in the federal government. In addition, the percentage of female employees (14.2 percent in 2012; 13.6 percent in 2011; and 12.4 percent in 2010) who teleworked infrequently (i.e., who telework no more than 1 or 2 days per month; who teleworked on an unscheduled or short-term basis) was also higher than that of male employees (12.7 percent in 2012; 11.7 percent in 2011; and 10.9 percent in 2010). With regard to one of the explanations for why female teleworkers outnumbered male teleworkers in the public sector, female employees are more likely than males to prefer working in public organizations because they expect to be able to spend more time with their children and elder dependents as well as manage other family issues by choosing teleworking or other types of alternative work schedules on a regular basis or more frequently. (Major et al., 2008; Caillier, 2012).

According to the psychological contract between employees and employers, which is consistent with social exchange theory, employees who are provided with flexible work hours or other family responsive programs by their supervisors or organizations are likely to have more positive attitudes toward their organizations and reciprocate with enhanced performance and organizational commitment (Rousseau, 1995; Crooker & Grover, 1993). In particular, the extent to which an employee has family responsibilities for taking care of children and elder dependents and other household demands at home is associated with an employee's perception of the impacts of family-friendly policies on outcome variables (Beauvais & Kowalski, 1993; Saltzstein et al., 2001). The empirical evidence regarding whether the effects of teleworking or other flexible work schedules are influenced by gender differences or dependent care obligations (i.e., family responsibilities) also has shown mixed results.

With regard to the link between family responsibility and an employee's perceived effect of flexible work arrangements including teleworking, Scandura and Lankau (1997) discussed that employees who have family responsibilities, which are measured by whether the employee has children under 18 living with her or him, reported higher positive perceptions than those who do not have a similar living situation regarding the association between the perceived existence of flexible work hours in their organizations and job satisfaction or organizational commitment. Thus, whether employees have family responsibilities for dependent family members has a moderating effect on the link between family-friendly programs (e.g., teleworking) and their promised outcomes (Hunsaker, 1985; Beauvais & Kowalski, 1993; Scandura & Lankau, 1997).

In addition, Scandura and Lankau (1997) found that female employees showed a more positive association between flexible work arrangements (e.g., teleworking) and job satisfaction or organizational commitment than did male employees. The findings were also closely associated with "gender differences in responses to psychological contracts" (Scandura & Lankau, 1997, p. 380; Mathieu & Zajac, 1990). The empirical results also implied that female employees are more sensitive to and have a greater appreciation for their organizations' support and provision of family-friendly policies than do males (Hoschild, 1989; Hunsaker, 1985; Scandura & Lankau, 1997; Major et al., 2008).

In a sample of mostly female healthcare professionals, Thomas and Ganster (1995) found that an employee who uses flexible work arrangements is likely to report a lower level of depression. In addition, Grover and Crooker (1995) found that female employees are more likely than males to want to have more flexibility, which can help support both their family needs and job duties. In this context, the use of family-friendly programs has a more negative correlation with intentions to leave for female employees relative to male employees (Grover & Crooker, 1995).

In contrast, female employees, especially working moms with children, usually suffer from a higher level of work-family conflict and less job satisfaction when they use flexible work arrangements (e.g., flex-time work and teleworking) or other types of family-friendly policies because they are more likely to have increased responsibilities for household chores and child and elder care responsibilities in comparison to their husbands (Hoschild, 1989; Williams, 2000; Hammer et al., 2005). This finding may result from differences between female and male married employees in the primary reasons for the choosing to telework. In other words, women tend to perceive and choose

telework programs as a means to balance their family-work demands and address their conflicting duties, whereas males do so for their career or performance improvement (Sullivan & Lewis, 2001; Frone, Russell & Cooper, 1992; Maruyama et al., 2009; Major et al., 2008).

Studying 245 professional employees at two information and financial services firms, Kossek et al., (2006) tried to empirically test the interaction effect for female employees who had children on the links between the use of a teleworking policy and several outcome variables (e.g., performance, work-to-family conflict, family-to-work conflict, turnover intention, depression). They found that female employees with children who use telework programs show lower levels of depression; however, the interaction effects were not statistically significant in the cases of the other dependent variables.

According to the theoretical expectation that numerous types of employees' characteristics (i.e., personal factors), including gender, age, marital status, having children or dependent care obligations, family income, and the presence of an employed spouse, have significant influences on teleworkers' satisfaction with teleworking and work-family balance, Saltzstein et al. (2001) compared the effects of several types of family-friendly policies, including a flexible schedule, a compressed schedule, a part-time schedule, a child-care program, and a telework program, on job satisfaction and satisfaction with work-family balance for 14 subgroups of public employees categorized by employees' characteristics in the U.S. federal government. The following subpopulations were tested in their empirical models: "single men under 30, single women under 30, married men over 60, unmarried men over 60, married women over 60 with a spouse unemployed, unmarried women over 60, men with an unemployed spouse

and children, women with an unemployed spouse and children, unmarried mothers, unmarried fathers, men under 35 with dual incomes and no children, women under 35 with dual incomes and no children, women with dual incomes and children, and men with dual incomes and children" (Saltzstein et al., 2001, p. 457).

Unlike the arguments that female employees, especially those working with dependent care obligations, suffer from a higher level of stress than males when they take advantage of family friendly policies, which have been supported by previous studies (e.g., Grover & Crooker, 1995; Thomas & Ganster, 1995; Hammer et al., 2005; Scandura & Lankau, 1997), Saltzstein et al. (2001) found that working at home shows similar levels of negative associations between employee satisfaction with both work-family balance and job satisfaction for the following three groups of employees: 1) men under 35 years of age who are dual-income, no children; 2) women under 35 years of age who are dual-income with no children; and 3) dual-income women with children.

Maruyama et al. (2009) investigated the difference in teleworkers' perceived work-life balance according to several factors, such as teleworkers' ages, the extent to which teleworkers control their working hours and the amount of working hours at home in a sample of 1,566 teleworkers who were registered under a telework program based in British Telecommunications. They found that teleworkers in the 55+ age group reported perceived their work-life balance more strongly and positively compared to the other age groups of teleworkers. Offering an explanation for these results, Maruyama et al. (2009) stated that teleworkers in the 55+ age group were less likely than members of younger age groups to be interrupted by family responsibilities such as child and elder care

obligations and other household related work while they were working at home (Christensen, 1988; Scandura & Lankau, 1997).

Older teleworkers were able to experience more beneficial effects of teleworking (e.g., work-family balance, job satisfaction, work performance) by having lower levels of child and elder care obligations. In addition, because they had worked longer in the organization and might therefore be in higher positions, teleworking enabled them to balance their work and family relationships well (Maruyama et al., 2009). In this context, Maruyama et al. (2009) found support for the proposition that teleworkers' age and family responsibility (dependent care obligation) can be another important factor influencing the links between telework and both job satisfaction and work-life balance. In a similar vein, Saltzstein et al. (2001, p. 463) found that "older unmarried men working at home" are likely to have higher levels of satisfaction with teleworking than younger married women, who are likely to have dependent family members who require their support, due to the members of the former group having fewer family care responsibilities and more efficient, workplace-friendly environments in their homes.

When taken together, a number of teleworking studies have found that a teleworker's family responsibilities (e.g., child or elder care obligations) can be a factor that interrupts working at home and makes it difficult for teleworkers to clearly separate time for work duties from time for family demands. Accordingly, such interruptions and the negative influence of family obligations are likely to reduce teleworkers' teleworking satisfaction levels and work-life balance (Maruyama et al., 2009, Saltzstein et al., 2001, Lee & Hong, 2011, Julien et al., 2011, Scandura & Lankau, 1997, Baruch, 2000, etc.).

However, according to the social exchange theory discussed above, teleworkers who perceive that they receive a higher level of support and benefits for their dependent care obligations from their employers and that have positive perceptions of the dependent care programs in their organizations are likely to reciprocate with more beneficial work attitudes and behaviors such as enhanced levels of job satisfaction, organizational commitment, and performance (Gould-Williams & Davies, 2005; Aryee et al., 2002; Caillier, 2013; Julien et al., 2011).

The positive association between employees' satisfaction with the family care programs in their organizations and their levels of job satisfaction can also be explained by the theory of work adjustments developed by Dawis, Lofquist and Weiss (1968). The theory states that employees are satisfied with their jobs and organizations when they can fully achieve their work requirements such as the skills and abilities required by their organizations, and the employees feel that their organizations fully support their work-life benefits, including dependent family care programs and other demands related to their family issues (Pierce & Newstrom, 1980). Therefore, the requirements and expectations of both employees and employers should be determined mutually so that the employees can achieve higher levels of job satisfaction (Dawis et al., 1968). Pierce and Newstrom (1980) particularly focused on work-life benefits and extended the theory of work adjustments by asserting that an employee who is more satisfied with her of his work-life benefits programs including child and elder care programs is likely to show higher levels of job satisfaction and increased organizational commitment.

By conducting an empirical analysis of U.S. federal government employees, Lee and Hong (2011) also found that an employee's level of satisfaction with the child care

subsidy policy offered by her or his federal agency was positively associated with organizational performance and an intention to remain with the agency. In addition, Caillier (2013) examined whether public employees' satisfaction levels with each of five types of work-life programs provided by U.S. federal government agencies (telework, alternative work schedules, health and wellness benefits, child care programs, and older adult care programs) are associated with employees' perceived levels of organizational commitment and job involvement based on U.S. federal government data. Using an empirical analysis, the author found that federal employees' levels of satisfaction with the child and elder care programs in their agencies were statistically and positively linked to their organizational commitment levels.

Although those two studies did not directly consider an employee's job satisfaction level as a dependent variable and the two studies included both teleworkers and non-teleworkers in their analyses, the empirical findings imply that both a teleworker's level of satisfaction with dependent care programs and the organization's support for family demands should be considered to provide a better understanding of the association between family responsibilities and job satisfaction with teleworking.

When taken together, the extant teleworking literature has not focused on what factors significantly influence the extent to which a teleworker is satisfied with her or his teleworking in the public sector. The literature has mainly discussed whether teleworkers, compared with non-teleworkers, have higher levels of perceived outcomes (e.g., job satisfaction, performance, organizational commitment, and work-life balance), without thorough attention to a teleworker's level of teleworking satisfaction and with little empirical analysis that can identify the significant factors associated with such

satisfaction levels. Thus, based on the comprehensive literature review discussed so far, this study aims to examine the effects on teleworkers' levels of satisfaction with teleworking in U.S. federal agencies from family responsibilities, including child and elder care obligations, and their satisfaction levels with their child and elder care programs.

Although one of the policy goals or outcomes from the implementation of a teleworking arrangement is to balance an employee's work duties and family responsibilities (e.g., dependent care obligations) and to improve the employee's work outcomes (e.g., job satisfaction, performance, or organizational commitment), a teleworker's level of satisfaction with teleworking and her or his work-life balance would likely be reduced if dependent care responsibilities are interrupted while working at home. For example, if the benefits provided by participation in a teleworking arrangement to support a teleworker's dependent care obligations are less than the drawbacks, such as low work quality and a lack of concentration due to interruptions caused by family care demands while working at home, then a teleworker's satisfaction with teleworking and her or his work-life balance will likely be reduced.

However, a teleworker's level of satisfaction with dependent care programs such as the child and elder care support provided by her or his organization would likely influence the level of satisfaction with teleworking. For example, with support and benefits from dependent care programs and a high level of satisfaction with them, teleworkers are likely to maintain improved concentration while teleworking and to have stronger perceptions that their family demands and responsibilities are supported by their

organizations and employers. Thus, they would likely have higher levels of teleworking satisfaction and other work-related outcomes.

Therefore, mere participation in or reliance on a teleworking arrangement is not likely to solely influence a teleworker's satisfaction with teleworking. More precisely, the association and its direction can depend on whether the teleworker has family obligations for dependent care and the extent to which she or he is satisfied with child and elder care program provided by her or his organization. To examine these issues, this study constructs the following hypotheses that test the effect of family responsibilities (child and elder care obligations) and satisfaction with dependent care programs on a teleworker's satisfaction with teleworking.

The reference group includes teleworkers who have child or elder care responsibilities.

H1: Teleworkers who do not have child care responsibilities will report higher levels of satisfaction with teleworking than teleworkers who have child care responsibilities;

H2: Teleworkers who do not have elder care responsibilities will report higher levels of satisfaction with teleworking than teleworkers who have elder care responsibilities;

H3: Satisfaction with child care programs will be positively related to satisfaction with teleworking; and

H4: Satisfaction with elder care programs will be positively related to satisfaction with teleworking.

Teleworkers' Volume of Teleworking and Teleworking Satisfaction Levels

According to OPM's 2011 and 2012 FEVS, regardless of any volume (extent) of telework arrangements, the percentage of federal employees who teleworked in 2012 was higher than it was in 2011. Specifically, 2.6 percent in 2012 (2.1 percent in 2011) of employees reported that they teleworked 3 or more days per week; 7.7 percent of employees reported that they teleworked 1 or 2 days per week in 2012 (6.0 percent in 2011); 3.8 percent of employees reported that they teleworked, but no more than 1 or 2 days per month in 2012 (3.3 percent in 2011); and 9.6 percent of employees reported that they teleworked very infrequently, on an unscheduled or short-term basis, in 2012 (9.4 percent in 2011).

Bailey and Kurland (2002) stated that the impact of frequency (i.e., volume or extent) of teleworking on differences in benefits from teleworking has been overlooked and has remained unanswered in the teleworking literature. They noted that several studies (e.g., McCloskey & Igbaria, 1998; Duxbury & Neufeld, 1999; Olszewski & Mokhtarian, 1994) explored whether the extent of teleworking had a moderating effect on the link between teleworking and outcomes by comparing frequent teleworkers with infrequent teleworkers. However, for the most part, empirical evidence that demonstrates how and to what extent the volume (frequency) of teleworking affects teleworkers' benefits or outcomes (e.g., work-life balance, job satisfaction or organizational commitment) has thus far not been sufficiently provided by the extant research (Bailey and Kurland, 2002).

With regard to the association between the volume (extent) of teleworking and a teleworker's satisfaction with teleworking, there are conflicting arguments in the

teleworking literature. On the one hand, social exchange theory supports the positive link between the volume (frequency) of teleworking and a teleworker' level of satisfaction with teleworking. Employees who feel they receive more support from their organizations or supervisors for establishing a work and family balance as a consequence of greater levels of flexibility in controlling their working hours and places of work under the telework program are more likely to report higher level of job satisfaction and have a higher level of intention to stay in the organizations (Lambert, 2000; Lee & Hong, 2010; Gould-Williams & Davies, 2005; Julien et al., 2010). Accordingly, employees who telework on a regular basis are likely to perceive higher levels of benefits from teleworking, to have reciprocity for their organizations, and to experience higher job satisfaction than employees who telework infrequently or irregularly (Eisenberger, Armeli, Rexwinkel, Lynch & Rhoades, 2001).

In a similar vein, Maruyama et al. (2009) used a sample of all of the telework employees at British Telecommunications to examine the factors that most strongly influence teleworkers' perceived quality of work-life balance. Based on their empirical results, time flexibility, which is the extent to which teleworkers perceive they can control their working hours and the amount of working hours spent at home, was the most influential and positive factor in improving teleworkers' work-life balance. Thus, employees who conduct a higher proportion of their tasks through home-based working (i.e., teleworking) were more likely to have positive perceptions of work-life balance and job satisfaction than employees who spent the majority of their working hours at the office because of their increased flexibility to control their working time and place (Maruyama et al., 2009). Several studies, such as those by Guimaraes and Dallow (1999)

and Feldman and Gainey (1997), also support the positive effects of a teleworker's perception of greater autonomy to adjust her or his working environment on the level of job satisfaction and other outcomes. The perception of autonomy can serve as a significant psychological factor to increase work motivation (Golden, 2006).

On the other hand, some studies have provided explanations for why and how teleworking could negatively impact teleworkers' job satisfaction levels. Compared with non-teleworkers, it is likely that teleworkers have greater perceptions of social and professional isolation, fewer opportunities for face-to-face interaction with coworkers or managers, and less connectedness to their organizations or employers due to increased reliance on electronic communication and technologies to perform their work duties (Cooper & Kurland, 2002; Bailey & Kurland, 2002; Baruch, 2000; Gainey, Kelley, & Hill, 1999, Caillier, 2012; Duxbury & Neufeld, 1999; Golden, 2006, etc.).

According to the literature, employees who telework more frequently are likely to have higher levels of such negative feelings of isolation, invisible interaction and disconnectedness with their organizations, and therefore, they are likely to have lower levels of job satisfaction and organizational commitment while working at home compared with employees who telework less frequently or non-teleworkers. From another perspective, teleworkers are likely to have work-time management problems regarding housework or family obligations and job duties (Lee & Hong, 2011; Tietze & Musson, 2005) as well as a need to address interruptions from family demands (Salaff, 2002; Maruyama et al., 2009) while working at home. Likewise, such negative factors could generally result in higher levels of work stress and job dissatisfaction among teleworkers.

In a similar vein, using a sample from the Department of Health and Human Services (DHHS) in the U.S. federal government, Caillier (2012) provided empirical findings that seem to contradict social exchange theory. The research examined whether infrequent teleworkers- those who telework less than one work day per week- had lower levels of three components of work motivation such as job satisfaction, organizational commitment, and job involvement than did frequent teleworkers, particularly those who teleworked at least one entire work day per week. Contrary to social exchange theory, the research found that frequent teleworkers reported lower levels of all three of the work motivation outcomes than did infrequent teleworkers. Caillier (2012) noted that his empirical results partially supported the curvilinear, inverted U-shape relationship between the extent (volume) of teleworking and job satisfaction proposed by Golden (2006) despite his study's limitation by including a dichotomous variable (frequent vs. infrequent teleworkers) rather than the consideration and inclusion of an exact number of days or hours of teleworking per week, which was the procedure that Golden (2006) followed.

In his survey, Golden (2006, p. 326) measured the extent (volume) of telecommuting using two measures: 1) "the average number of hours per week they spent consistently away from their office working as a telecommuter", and 2) "the proportion of the average workweek that they spent telecommuting." The survey was administered to full-time and professional-level employees who participated in a teleworking arrangement with multiple ranges of teleworking volume in a high technology & communication corporation in the United States. Golden (2006) found no significant

differences between these two indicators and utilized the number of hours of teleworking per week to measure the extent (volume) of teleworking in his analysis.

With regard to the relationship between volume of teleworking and a teleworker's satisfaction with teleworking, Golden (2006) provided a substantive contribution to the teleworking scholarship. As discussed above, there are two conflicting arguments in the telework literature regarding whether teleworking leads to a positive (e.g., increased autonomy and flexibility to control work hours and places and enhanced reciprocal behaviors and attitudes) or negative (e.g., increased isolation and decreased interactions with organization and co-workers because of excessive reliance on electronic technology and devices) association with a teleworker's job satisfaction.

To explain the conflicting arguments, Golden (2006) suggested by virtue of his empirical evidence that the shape of the relationship between teleworking and a teleworker's satisfaction with teleworking follows a curvilinear inverted U-shape. Accordingly, a teleworker's satisfaction with teleworking increases as the volume (extent) of telework increases with the receipt of the positive benefits of teleworking; however, the increase in teleworking satisfaction drops off and begins to decline because of the negative influence of the increased reliance on electronic communication tools when teleworking is conducted extensively (Golden, 2006).

Finally, based on the empirical findings, Golden (2006) suggested a practical implication and a managerial lesson that supervisors should manage and limit the extent of employees' teleworking to approximately two days per week (i.e., 14.56 hours per week in the study), when a teleworker's job satisfaction level is at its apex. In this way, both organizations and employees can maximize the positive effects of teleworking on

teleworking satisfaction. Furthermore, Golden (2006) found that the curvilinear inverted U-shape relationship between the extent of teleworking and satisfaction with teleworking was mediated by a teleworker's leader-member relationship quality, team-member exchange quality, and work-family conflict. In particular, these three mediators, the volume (extent) of teleworking, and a teleworker's satisfaction with teleworking were closely connected to and influenced by each other.

Based on the discussions and arguments in the extant teleworking literature, particularly Golden's (2006) curvilinear relationship between the volume of teleworking and a teleworker's satisfaction with teleworking, this study constructs the following hypotheses to be examined.

The reference group includes teleworkers who telework 1 or 2 days per week.

H5: Teleworkers who telework 1 or 2 days per week will report higher levels of satisfaction with teleworking than teleworkers who telework 3 or more days per week;

H6: Teleworkers who telework 1 or 2 days per week will report higher levels of satisfaction with teleworking than teleworkers who telework 1 or 2 days per month; and

H7: Teleworkers who telework 1 or 2 days per week will report higher levels of satisfaction with teleworking than teleworkers who telework very infrequently on an unscheduled or short-term basis.

Prospective Theoretical and Managerial Contributions of the Study

The study can contribute to the development of the teleworking and family-friendly workplace policies literature in the public sector in the following ways. First, very few studies have discussed and focused on teleworking and its related outcomes (e.g., performance, turnover intention, job satisfaction, work-family balance) using empirical analyses of U.S. federal government agencies (e.g., Lee & Hong, 2011; Saltzstein et al., 2001; Caillier, 2012 & 2013, etc.). An empirical study by Julien et al. (2011) used survey data from the Canadian federal government. Thus, this study can contribute to the teleworking literature by examining several factors that may affect an employee's teleworking satisfaction level with empirical evidence from U.S. federal agencies.

Second and more importantly, as noted above, the extant teleworking literature has primarily focused on the effects of teleworking programs or participation on an employee's overall job satisfaction. Thus, theoretical arguments and empirical evidence examining the significant factors in teleworkers' satisfaction levels largely remain to be explored. In this context, the examination of the research questions and hypotheses from this study is necessary to effectively achieve policy goals or benefits from teleworking arrangements, improve teleworkers' satisfaction levels and to address the theoretical and empirical gaps in the current teleworking literature on public sectors. In addition, this study is able to provide theoretical contributions and empirical evidence by advancing the previous teleworking literature, which has merely compared the different influences of family-friendly policies on outcomes within or across a variety of employee

demographics and family-structure conditions (e.g., Saltzstein et al., 2001; Scandura & Lankau, 1997; Maruyama et al., 2009; Kossek et al., 2006, etc.).

Third, through its empirical findings, this study can identify managerial and practical implications of telework programs for the benefit of public managers, supervisors, and top teleworking managers, such as the Telework Managing Officer (TMO), who has the primary responsibility for implementing the agency's telework program, designated by the Telework Enhancement Act of 2010 (Public Law 111-292) (OPM, 2011, p. 18). This study is able to provide information for managers regarding which characteristics of federal teleworkers are associated with their satisfaction with teleworking. Specifically, using the empirical findings and implications from this study, public managers can obtain a better sense of how dependent care programs and teleworkers' dependent care obligations are related to and interact with employees' satisfaction with teleworking programs. In addition, the empirical evidence provided in this study on the association between teleworking volume and satisfaction with teleworking can allow managers to more effectively implement teleworking arrangements in federal agencies.

Fourth, this study can help to connect a teleworker's characteristics (i.e., dependent care responsibilities and volume of teleworking in this study) and teleworking satisfaction with agency performance by providing empirical evidence on this association in the federal government. Previous teleworking research revealed that the implementation of telework programs can directly and positively influence the level of job performance or organizational productivity (e.g., Major et al., 2008; Martinez-Sanchez et al., 2007; Manoochehri & Pinkerton, 2003; OPM 2013). Furthermore,

according to the social exchange theory (Lee & Hong, 2010; Julien et al., 2010; Gould-Williams, 2005; Caillier, 2013), employees who have higher levels of satisfaction with teleworking are more likely to reciprocate in a beneficial manner to their organizations through enhanced job performance and organizational commitment, accompanied by a high level of job satisfaction. Therefore, this study is able to provide federal agencies with managerial implications regarding how teleworkers' family responsibilities and volume (frequency) of teleworking are associated with the employees' satisfaction with their teleworking arrangements, thereby contributing to a richer understanding of work/agency performance.

Summary and Synthesis of the Literature

The literature discussed in this chapter provides an overview of the development, role, and function of family-friendly policy, particularly with regard to teleworking in the public sector. This chapter discussed the official definition and background of teleworking, the legislative efforts favoring its implementation in the U.S. federal government, and the pros and cons of teleworking in terms of three perspectives—those of the employees, managers, and society. In addition, this chapter reviewed social exchange theory, which has been widely utilized in the past teleworking literature to explore the nature of the relationship between teleworking or family-friendly policy and its outcomes. Finally, the key empirical findings and implications regarding the association between teleworking and outcomes, particularly focused on a teleworker's job satisfaction, were discussed in this chapter. In this way, this chapter provided the

conceptual or theoretical background and assessment associated with the implementation of teleworking and family-friendly policy in public organizations.

A number of studies have provided empirical evidence on the associations between teleworking and several outcome variables (e.g., job satisfaction, performance, intention to leave, work-family balance, organizational commitment) in the public sector over the last two decades. As discussed in this chapter, those empirical studies have employed a variety of methodologies, data samples, analytical techniques and model specifications.

The findings of these empirical studies have supported mixed and conflicting results. Some studies have suggested a positive relationship between teleworking and outcome variables. In contrast, others have supported the negative or insignificant associations between them. Additionally, several studies have shown that the implementation of teleworking manifests positive links with particular outcomes but that it also leads to negative outcomes for particular situations. More importantly, several studies have tried to examine and have supported the notion that the link between teleworking and outcomes can be significantly influenced by an employee's various characteristics (i.e., person-level factors), such as gender, age, material status, whether the employee has young children, family income, presence of an employed spouse or other family members, and volume (extent) of telework.

However, the extant teleworking literature has merely compared the effects of teleworking or other types of family-friendly policies on outcome variables among different groups of employees who are categorized by demographic factors, as noted above. In addition, the literature has mainly focused on whether teleworkers, compared

with non-teleworkers, have more positive perceptions of several work-related outcomes (e.g., job satisfaction, performance, organizational commitment, and work-life balance). As a result, very few studies have focused on a teleworker's satisfaction with teleworking itself in the public sector. Understandably, few empirical analyses have examined what factors have significant effects on a teleworker's satisfaction with teleworking.

The theoretical and empirical gaps in previous teleworking studies lead to the formulation of the research questions and hypotheses to be examined in this study. Specifically, this study aims to provide a better understanding of an employee's teleworking satisfaction in U.S. federal agencies by examining how and to what extent federal government teleworkers' family responsibilities (i.e., child and elder care obligations), satisfaction levels with the dependent care programs provided by their organizations, and the volume (frequency) of their teleworking influence their job satisfaction levels.

Consequently, this study will be able to contribute to the body of teleworking and family-friendly policy literature in the public sector by providing empirical evidence, methodological strategies, and practical implications for public managers. More detailed descriptions of the data source, variables, research methodologies, and analytical model specifications can be found in the following chapter.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

The purpose of this chapter is to propose and explain the research methodology and strategies employed in this study to examine the factors that are associated with a teleworker's satisfaction with teleworking in U.S. federal agencies. Specifically, this chapter states the research question and hypotheses of this study. It also explains the data source and samples that are used in the study, including descriptions of the dependent, independent, and control variables included in the analytical models used to address the research questions and hypotheses. Finally, this chapter describes the research methodologies and strategies and discusses how they are employed to examine the effects of a teleworker's family responsibilities, satisfaction with dependent care programs, and volume (frequency) of teleworking on her or his teleworking satisfaction level.

Research Question

Based on a comprehensive literature review, the following research question guided this study: How and to what extent do teleworkers' family responsibilities (i.e., child and elder care), satisfaction with the dependent care programs provided the organization (i.e., child and elder care programs), and volume (frequency) of teleworking influence teleworkers' satisfaction levels with teleworking in the public sector?

Hypotheses

Hypotheses Related to the Relationship between Teleworkers' Family Care Responsibilities and Teleworking Satisfaction Levels

This study empirically tests and examines how and the extent to which federal government teleworkers' family responsibilities (i.e., child and elder care obligations) and satisfaction levels with the dependent care programs provided by their organizations are associated with their teleworking satisfaction levels. Thus, the following hypotheses are constructed.

The reference group includes teleworkers who have child or elder care responsibilities.

Hypothesis 1: Teleworkers who do not have child care responsibilities will report higher levels of satisfaction with teleworking than teleworkers who have child care responsibilities;

Hypothesis 2: Teleworkers who do not have elder care responsibilities will report higher levels of satisfaction with teleworking than teleworkers who have elder care responsibilities;

Hypothesis 3: Satisfaction with child care programs will be positively related to satisfaction with teleworking; and

Hypothesis 4: Satisfaction with elder care programs will be positively related to satisfaction with teleworking.

Hypotheses Related to the Relationship between the Volume (Frequency) of Teleworking and Teleworking Satisfaction Levels

This study empirically tests and examines how and the extent to which federal government teleworkers' volume (frequency) of teleworking is associated with their teleworking satisfaction levels. Thus, the following hypotheses are constructed.

The reference group includes teleworkers who telework 1 or 2 days per week.

Hypothesis 5: Teleworkers who telework 1 or 2 days per week will report higher levels of satisfaction with teleworking than teleworkers who telework 3 or more days per week;

Hypothesis 6: Teleworkers who telework 1 or 2 days per week will report higher levels of satisfaction with teleworking than teleworkers who telework 1 or 2 days per month; and

Hypothesis 7: Teleworkers who telework 1 or 2 days per week will report higher levels of satisfaction with teleworking than teleworkers who telework very infrequently on an unscheduled or short-term basis.

Data Source

This study utilizes the 2011 Federal Employee Viewpoint Survey published by the Office of Personnel Management to address the hypotheses and research questions proposed above. From 2002 to 2008, the Federal Human Capital Survey (FHCS) was conducted and published every two years. The name of the survey was changed to the FEVS in 2010.

The main function of this survey is to provide federal agencies with a tool that represents employees' perceptions of "whether, and to what extent, conditions that characterize successful organizations are present in their agencies" (OPM, 2011, p. 27). In particular, the FEVS has the following three objectives and utilizations. First, it provides measures of "how well the federal government is running its human resource management systems" for federal agencies. Second, the survey provides straightforward implications "to develop policies and action plans for improving agency performance" for senior managers. Third, it offers a critical tool for the OPM to "assess individual agencies and their progress on strategic management of human capital" (OPM, 2011, p. 27).

The survey uses a probability sample (i.e., a known and non-zero probability of selection), which is beneficial in generalizing survey results to attributes of the overall population of federal employees. The FEVS is conducted by a self-reported survey administered on-line; however, employees who have problems accessing the web-based survey can participate using a paper version of the survey (OPM, 2011). The 2011 FEVS has 95 items in its questionnaire that are grouped into eight topic components, including "personal work experiences, work unit, agency, supervisor/team leader, leadership, satisfaction, work/life, and demographics" (OPM, 2011, p. 27).

The respondents are U.S. federal employees who are full-time, permanent employees of all 29 departments and large agencies represented in the President's Management Council (PMC) and 54 small and independent agencies. The participating agencies account for 97 percent of the executive branch workforce. Appendix A specifically represents a list of agencies and departments that participated in the 2011

Federal Employee Viewpoint Survey. Of the 540,727 employees who received the 2011 FEVS, 266,376 completed it (for a 49.3 percent response rate).

Sample of the Study

In OPM's effort to examine the effectiveness of the telework program's implementation, the 2011 FEVS asked federal government employees about their current telework situation: "Please select the response below that best describes your current teleworking situation" (q73): (a) "I telework 3 or more days per week"; (b) "I telework 1 or 2 days per week"; (c) "I telework, but no more than 1 or 2 days per month"; (d) "I telework very infrequently, on an unscheduled or short-term basis"; (e) "I do not telework because I have to be physically present on the job"; (f) "I do not telework because I have technical issues"; (g) "I do not telework because I did not receive approval to do so, even thought I have the kind of job where I can telework"; and (h) "I do not telework because I choose not to telework."

The final sample used in this study only includes federal government teleworkers who chose one of the first four categories presented above because this study primarily focuses on the factors that significantly influence a federal teleworker's satisfaction with teleworking and excludes federal employees who do not telework, regardless of their reported reasons. Finally, the model in this study included 91,386 employees, who accounted for 36.91% of the total of 247,588 employees who responded to the survey item (q73).

Variables and Measurement

Dependent Variable

To measure a federal employee's satisfaction level with the work/life programs implemented by federal agencies, the 2011 FEVS examined the extent to which an employee is satisfied with each such programs as telework, alternative work schedules, health and wellness programs, employee assistance programs, child care programs, and elder care programs. Among such work/life programs in federal agencies, the dependent variable in this study is a federal employee's satisfaction with teleworking, which was measured using the following survey question: "How satisfied are you with the following Work/Life programs in your agency? Telework" (q79). The employees' responses were measured using a five-point Likert-type scale: 1 (very dissatisfied), 2 (dissatisfied), 3 (neither satisfied nor dissatisfied), 4 (satisfied), 5 (very satisfied), and X (no basis to judge).

With regard to the use of a single Likert-type item as a dependent variable, Bergkvist and Rossiter (2007) discussed how there is no serious difference or bias in the predictive validity of single-item versus multiple-item measures for measuring the same variable. Along a similar vein, Moynihan and Pandey (2010) suggested that single-item measures are unlikely to have less reliability than multiple-item measures, especially when multiple-item measures have such a high level of inter-item correlation as to allow them to be aggregated into a single scale, based on arguments from previous studies (Bergkvist & Rossiter, 2007; Gardner, Cummings, Dunham & Pierce, 1998; Wanous & Hundy, 2001).

Independent Variables

As noted previously, the main purpose of this study is to empirically test the effects of a teleworker's family care responsibilities (i.e., child and elder care obligations), satisfaction with child and elder care programs, and volume (frequency) of teleworking on her or his satisfaction with teleworking.

First, the family responsibility variable encompassed child care programs and was measured using the following survey questions: "Do you participate in the following Work/Life programs? Child Care Programs (e.g., daycare, parenting classes, parenting support groups)" (q77). The variable also included elder care programs and was further measured using the following survey item: "Do you participate in the following Work/Life programs? Elder Care Programs (e.g., support groups, speaker)" (q78). The employees were provided the following choices for their responses: 1 = yes, 2 = no, and 3 = not available to me. Obviously, some employees may not actually participate in the child or elder care programs provided by their agencies for various reasons, even though they may have dependent care responsibilities. However, it is important to note that the overall premise of this study is that employees who have family care obligations currently participate in their agencies' corresponding work/life programs.

Second, an employee's level of satisfaction with the child care programs was measured using the following item: "How satisfied are you with the following Work/Life programs in your agency? Child Care Programs" (q83). The employee's level of satisfaction with the elder care programs was measured using the following question: "How satisfied are you with the following Work/Life programs in your agency? Elder Care Programs" (q84). The employees were provided the following choices for their

responses: 1 = very dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied, 5 = very satisfied, and X = no basis to judge.

Third, the volume (extent) of telework represents how frequently federal employees carry out their job duties by teleworking. As discussed above, federal employees who currently telework are placed in one of four categories—coded 1 for "I telework 3 or more days per week," 2 for "I telework 1 or 2 days per week," 3 for "I telework no more than 1 or 2 days per month," and 4 for "I telework very frequently on an unscheduled or sort-term basis,"—depending on their responses to the survey item, "Please select the response below that best describes your current teleworking situation" (q73).

Control Variables

This study examined respondents' demographic factors and characteristics as its control variables. These variables included gender, age, supervisory status (managerial level), years of tenure in the federal government and current agency, and work location. These control factors may affect an employee's level of job satisfaction (Caillier, 2013, Moynihan & Pandey, 2007; Fernandez, 2008). The selection of race (ethnicity) aimed to control the influence of this variable separate from the effects of other variables on the dependent variable of teleworking satisfaction. Based on the literature review, I did not find a thorough discussion or empirical evidence that teleworkers' race (ethnicity) influences their levels of job satisfaction with teleworking. In this context, a teleworker's race was not considered as a control variable, and this study did not focus on this demographic factor.

In the survey, the gender variable is coded 0 for males, 1 for females. Employees are categorized into five groups depending on their age: coded 1 for under 29 years, 2 for 30–39 years, 3 for 40–49 years, 4 for 50–59 years, 5 for 60 years or older. In addition, federal employees' managerial levels are coded as follows: 1 = non-supervisors or team leaders; 2 = supervisors; and 3 = managers or executives. The tenure in federal government variable is coded as follows: 1 = up to 3 years; 2 = 4 to 5 years; 3 = 6 to 10 years; 4 = 11 to 14 years; 5 = 15 to 20 years; and 6 = more than 20 years. The tenure in current agency variable is coded as follows: 1 = up to 3 years; 2 = 4 to 5 years; 3 = 6 to 10 years; 4 = 11 to 20 years; and 5 = more than 20 years. In addition, an employee's work location is coded 0 for headquarters, 1 for fields.

According to previous job satisfaction research (e.g., Caillier, 2012 & 2013; Pitts, 2009; Fernandez, 2008; Moynihan & Pandey, 2007), several organizational factors or constraints that may influence the dependent variable of employees' teleworking satisfaction were included in the models as control variables: (1) "supervisory support," measured by responses to the item, "My supervisor supports my need to balance work and other life issues" (q42); (2) "sufficient resources," measured by responses to the item, "I have sufficient resources (for example, people, materials, budget) to get my job done" (q9); (3) "awards for performance," measured by responses to the item, "Awards in my work unit depend on how well employees perform their jobs" (q25); (4) "performance appraisal," measured by responses to the item, "My performance appraisal is a fair reflection of my performance" (q15); (5) "leaders' integrity," measured by responses to the item, "My organization's leaders maintain high standards of honesty and integrity" (q54); (6) "person-job fit," measured by responses to the item, "My talents are used well

in the workplace" (q11); (7) "cooperation," measured by responses to the item, "The people I work with cooperate to get the job done" (q20); and (8) "sharing job knowledge," measured by responses to the item, "Employees in my work unit share job knowledge with each other" (q26). Employees' responses to all of these items are measured using a five-point Likert-type scale: 1 (strongly disagree); 2 (disagree); 3 (neither agree nor disagree); 4 (agree); and 5 (strongly agree).

Research Methodology & Model Specification

Level of Analysis

This analysis is conducted at an individual level rather than at an agency or organizational level because the central purpose of this study is to examine how and to what extent federal teleworkers' family care responsibilities, satisfaction with child and elder care programs, and volume of teleworking influence their levels of satisfaction with teleworking in the federal agencies. In addition, based on the discussions from Lee and Hong (2011) and Saltzstein et al. (2001) described above, using an individual level of analysis is more straightforward than an agency-level analysis to fully capture the nature of the relationship between such factors and a teleworker's teleworking satisfaction. Therefore, although using a large-scale sample analysis, as in this study, may lead to false statistically significant relationships between independent and dependent variables, using employees' perceptual data at an individual level is reasonable to address the previously stated research questions and hypotheses.

Research Methodology and Data-Analysis Strategy

This study will provide the descriptive statistics showing the overall features of the sample chosen for the empirical analyses. From the descriptive statistics, the distributions of the dependent, independent, and control variables to be employed in this study, including their central tendencies (identified by means) as well as their dispersion (identified by standard deviation and range) will be specified in the following chapter. Furthermore, to explain the distribution of the sample of federal government teleworkers using demographics, this study will provide tables that analyze the characteristics of the sample based on teleworkers' demographic factors, including gender, age (by generations), volume of telework, supervisory level, tenure measured as years in the federal government, tenure measured as years in the current agency, and work location. Finally, to examine how a teleworker might hold different perceptions with respect to the level of satisfaction with teleworking, depending on her or his demographic factors, a series of cross-tabulation analyses and contingency tables will be employed in the following chapter.

Then, to explore the effects of a teleworker's family care responsibilities, satisfaction with child and elder care programs, and volume of teleworking on her or his teleworking satisfaction, this study will employ an ordered probit analysis because the dependent variable is measured using a five-point Likert-type scale. If an ordinary least squares (OLS) regression is used to explore the determinants of ordinal dependent variables, which violate the assumptions of OLS regression, the analysis results are likely to be biased compared with the true attributes of the population. However, this study will employ both ordered probit analysis and OLS regression based on the assumption that

there will not likely be a problematic difference in results between OLS regression and ordered probit analysis in the case of a large-N data analysis, as is the case in this study (Dittrich, Francis, Hatzinger, & Katzenbeisser, 2007; O'Brien, 1981; Pitts. 2009). Thus, this study will compare the statistical results derived from both OLS and ordered probit models to investigate any significant differences. If there is no significant difference between those two analyses, then this study will focus more on the findings drawn from OLS regression analysis because the interpretation of OLS regression results is more straightforward or intuitive than the interpretation of an ordered probit model.

Finally, this study will address the expected correlated error terms of individual employees who work in the same federal government agency by clustering the standard errors by agency. The 2011 FEVS used in this study included federal employees' responses to the survey questionnaire, which were grouped by agency. In this case, without clustering the standard errors by agency, we might have risked correlating error terms that would be similar for employees of the same agency. Moreover, the correlated errors are likely to deflate the standard errors of the independent variables and likely to make the statistical associations between the dependent and independent variables statistically significant even though they may not actually exist. Therefore, this study will cluster the standard errors for individuals within the same agency when conducting a series of ordered probit and OLS regression analyses.

Model Specifications for the Analysis

The first stage aims to examine how and to what extent a teleworker's family responsibilities (i.e., child and elder care obligations) and satisfaction with child and elder

care programs are associated with her or his level of satisfaction with teleworking, representing Hypotheses 1 through 4. To address this goal, this study will compare teleworkers who do not have such dependent care responsibilities (coded 0) with a reference group of teleworkers who have family care responsibilities (coded 1). Thus, the coefficient of the child or elder care variable represents the difference in teleworkers' teleworking satisfaction between those two groups of federal teleworkers.

The second stage aims to examine the association between volume (frequency) of teleworking and a teleworker's level of satisfaction with teleworking, representing Hypotheses 5 through 7. To address this aim, the stage will compare teleworkers from each of the three different teleworking arrangements with a reference group of teleworkers who teleworked 1 or 2 days per week. Specifically, the stage will be composed of three sub-models, each having different volumes of teleworking arrangements for its teleworkers: 1) model 1 includes teleworkers who telework 3 or more days per week (coded 0) and teleworkers who telework 1 or 2 days per week (coded 1); 2) model 2 includes teleworkers who telework 1 or 2 days per month (coded 0) and teleworkers who telework 1 or 2 days per week (coded 1); and 3) model 3 includes teleworkers who telework very infrequently on an unscheduled or short-term basis (coded 0) and teleworkers who telework 1 or 2 days per week (coded 1). The coefficient of the volume of teleworking variable in each model indicates the difference in employees' teleworking satisfaction between teleworkers corresponding to each volume of telework and the reference group (i.e., teleworkers who telework 1 or 2 days per week).

Coding Information for Analysis

Dependent Variable (Y)

Teleworking Satisfaction
Q79) How satisfied are you with the following Work/Life programs in your agency? Telework

Value Scales;
5(Very Satisfied); 4(Satisfied); 3(Neither Satisfied nor Dissatisfied); 2(Dissatisfied); 1(Very Dissatisfied)

Independent Variables (X)

Child Care Responsibility
Q77) Do you participate in the following Work/Life programs? Child Care Programs (for example, daycare, parenting classes, parenting support groups)

Value Scales;
0 (No); 1 (Yes)

Elder Care Responsibility
Q78) Do you participate in the following Work/Life programs? Elder Care Programs (for example, support groups, speakers)

Value Scales;
0 (No); 1 (Yes)

Satisfaction with Child Care Program
Q83) How satisfied are you with the following Work/Life programs in your agency? Child Care Programs (for example, daycare, parenting classes, parenting support groups)

Value Scales;
5(Very Satisfied); 4(Satisfied); 3(Neither Satisfied nor Dissatisfied); 2(Dissatisfied); 1(Very Dissatisfied)

Satisfaction with Elder Care Program
Q84) How satisfied are you with the following Work/Life programs in your agency? Elder Care Programs (for example, support groups, speakers)

Value Scales;
5(Very Satisfied); 4(Satisfied); 3(Neither Satisfied nor Dissatisfied); 2(Dissatisfied); 1(Very Dissatisfied)

Volume of Teleworking
Q73) Please select the response below that BEST describes your current teleworking situation

Value Scales;
1 “I telework 3 or more days per week”;
2 “I telework 1 or 2 days per week”;
3 “I telework, but no more than 1 or 2 days per month”;
4 “I telework very infrequently, on an unscheduled or short-term basis”;
5 “I do not telework because I have to be physically present on the job”;
(e.g., Law Enforcement Officers, Park Rangers, Security Personnel)”;
6 “I do not telework because I have technical issues (e.g., connectivity, inadequate equipment) that prevent me from teleworking”;
7 “I do not telework because I did not receive approval to do so, even though I have the kind of job where I can telework”; and
8 “I do not telework because I choose not to telework”

<u>Control Variables</u>

Gender
Q) Are you~?

Values Scales;
0 (Male); 1 (Female)

Age
Q) What is your age group?

Values Scales;
1 (29 and under); 2 (30-39); 3 (40-49); 4 (50-59); 5 (60 or over)

Supervisory Level
Q) What is your supervisory status?

Value Scales;
1 (Non-Supervisor/Team Leader)
2 (Supervisor)
3 (Manager/Executive)

Tenure in Federal Government
Q) How long have you been with the Federal Government (excluding military service)?

Value Scales;
1 (Up to 3 years); 2 (4 to 5 years); 3 (6 to 10 years); 4 (11 to 14 years); 5 (15 to 20 years); 6 (More than 20 years)

Tenure in Current Agency
Q) How long have you been with your current agency (for example, Department of Justice, Environmental Protection Agency)?

Value Scales;
1 (Up to 3 years); 2 (4 to 5 years); 3 (6 to 10 years); 4 (11 to 20 years); 5 (More than 20 years)

Work Location
Q) Where do you work?

Value Scales;
0 (Headquarters); 1 (Fields)

Supervisory Support
Q42) My supervisor supports my need to balance work and other life issues

Value Scales;
5 (Strongly Agree); 4 (Agree); 3 (Neither Agree nor Disagree); 2 (Disagree); 1 (Strongly Disagree)

Sufficient Resources
Q9) I have sufficient resources (for example, people, materials, budget) to get my job done

Value Scales;
5 (Strongly Agree); 4 (Agree); 3 (Neither Agree nor Disagree); 2 (Disagree); 1 (Strongly Disagree)

Awards for Performance
Q25) Awards in my work unit depend on how well employees perform their jobs

Value Scales;
5 (Strongly Agree); 4 (Agree); 3 (Neither Agree nor Disagree); 2 (Disagree); 1 (Strongly Disagree)

Performance Appraisal
Q15) My performance appraisal is a fair reflection of my performance

Value Scales;
5 (Strongly Agree); 4 (Agree); 3 (Neither Agree nor Disagree); 2 (Disagree); 1 (Strongly Disagree)

Leaders' Integrity
Q54) My organization's leaders maintain high standards of honesty and integrity

Value Scales;
5 (Strongly Agree); 4 (Agree); 3 (Neither Agree nor Disagree); 2 (Disagree); 1 (Strongly Disagree)

Person-Job Fit
Q11) My talents are used well in their workplace

Value Scales;
5 (Strongly Agree); 4 (Agree); 3 (Neither Agree nor Disagree); 2 (Disagree); 1 (Strongly Disagree)

Cooperation
Q20) The people I work with cooperate to get the job done

Value Scales;
5 (Strongly Agree); 4 (Agree); 3 (Neither Agree nor Disagree); 2 (Disagree); 1 (Strongly Disagree)

Sharing Job Knowledge
Q26) Employees in my work unit share job knowledge with each other

Value Scales;
5 (Strongly Agree); 4 (Agree); 3 (Neither Agree nor Disagree); 2 (Disagree); 1 (Strongly Disagree)

Summary

As discussed in the chapter, this study utilizes the 2011 Federal Employee Viewpoint Survey and includes only those federal employees who teleworked at any volume to address the proposed research questions and hypotheses. The dependent variable of this study is the teleworking satisfaction of teleworkers. The independent variables consist of the teleworkers' family care responsibilities, satisfaction with child and elder care programs, and volume (frequency) of teleworking. Additionally, this study controls for teleworkers' other demographic factors, including gender, age, supervisory level, tenure in terms of years in the federal government, tenure in years in their current agency, and work location, as well as several organizational factors, such as supervisory support for the balance between work and life, sufficiency of resources, awards for performance, fairness of performance appraisals, leaders' integrity, fitness between the person and her or his job, cooperation with co-workers, and sharing job knowledge in the work unit.

By calculating descriptive statistics and conducting a series of ordered probit analyses and OLS regressions at an individual level of analysis, this study will provide empirical evidence for how and to what extent a teleworker's family responsibilities, level of satisfaction with child and elder care programs, and volume of teleworking influence her or his satisfaction with teleworking in the U.S. federal government. More detailed descriptions of statistical research methods, procedures, and model specifications to be employed in this study can be found in the following chapter, with statistical findings and results drawn from the statistical analyses.

CHAPTER 4

STATISTICAL RESULTS

Introduction

This chapter will describe and explain the statistical results drawn from the proposed research methods. These results include the characteristics of the sample based on the teleworkers' demographic factors, the difference in the levels of teleworking satisfaction based on the teleworkers' demographic factors, and the effects of a teleworker's family responsibilities (child and elder care obligations), her or his satisfaction with the agencies' dependent care programs, and the volume (frequency) of teleworking on the level of satisfaction with teleworking in U.S. federal agencies. Finally, this chapter will summarize the results of the tests of the study's hypotheses.

Characteristics of the Sample

As described above, the study sample included those United States federal government employees who reported that they currently participated in the telework program. Namely, this study excluded federal employees who did not telework regardless of the particular reasons that they did not engage in such work. As a result, the final sample had 91,386 teleworkers, corresponding to 36.91% of the total 247,588 employees who participated in the 2011 FEVS. This section presents three components of characteristics of the study sample, as follows: 1) the descriptive statistics, including central tendency and dispersion, for the dependent, independent and control variables included in this study; 2) the distribution of the sample according to demographic factors;

and 3) the distribution of the teleworkers' responses concerning satisfaction with teleworking, according to their demographics.

Descriptive Statistics of the Total Sample

The descriptive statistics are provided in Table 1. The distributions, including the central tendencies (identified by means) and dispersion (identified by standard deviation and range), of the dependent, independent, and control variables included in the statistical analysis were analyzed. As shown in Table 1, the mean score of the federal teleworkers' satisfaction levels with teleworking (3.979) was quite close to the "satisfied" scale (indicated by 4). Furthermore, for all of the organizational factors employed as control variables that might influence the dependent variable of job satisfaction, the federal teleworkers revealed satisfaction levels that were greater than 3 and close to the "satisfied" scale. However, the mean scores of the federal teleworkers' satisfaction levels with child and elder care programs (3.248 and 3.195, respectively) were close to "neither satisfied nor dissatisfied" (indicated by 3).

Table 1. Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max
Teleworking Satisfaction (1-5)	3.979	1.011	1	5
Volume of Teleworking (1-4)	2.940	1.052	1	4
Child Care Responsibility (1: Yes; 0: No)	.031	.174	0	1
Elder Care Responsibility (1: Yes; 0: No)	.023	.150	0	1
Satisfaction with Child Care Program (1-5)	3.248	.817	1	5
Satisfaction with Elder Care Program (1-5)	3.195	.690	1	5
Gender (1: Females; 0: Males)	.532	.499	0	1
Age (1-5)	3.307	1.058	1	5
Supervisory Level (1-3)	1.346	.651	1	3
Tenure in Federal Government (1-6)	4.179	1.833	1	6
Tenure in Current Agency (1-5)	3.291	1.463	1	5
Work Location (1: Field; 0: Headquarter)	.490	.500	0	1
Supervisory Support (1-5)	4.217	.923	1	5
Sufficient Resource (1-5)	3.141	1.222	1	5
Awards for Performance (1-5)	3.330	1.176	1	5
Performance Appraisal (1-5)	3.840	1.080	1	5
Leader's Integrity (1-5)	3.625	1.125	1	5
Person-Job Fit (1-5)	3.546	1.157	1	5
Cooperation (1-5)	3.972	.915	1	5
Sharing Job Knowledge (1-5)	3.906	.980	1	5

Coding information and unit of the variables are notified above.

Distribution of the Sample by Demographics

This section describes the distribution of the study sample according to the teleworkers' demographic factors, including gender, age, volume of teleworking, supervisory level, tenure (years in the federal government and years in the current agency), race, and work location.

Distribution of the Teleworkers by Gender

The study sample included 46,731 female teleworkers (53.18%) and 41,138 male teleworkers (46.82%).

Table 2. Distribution of the Teleworkers by Gender

Gender	Frequency	Percent	Cumulative Percent
Male	41,138	46.82	46.82
Female	46,731	53.18	100.00
Total	87,869	100.00	

Distribution of the Teleworkers by Age Group

The ages of the federal teleworkers who participated in the 2011 FEVS were categorized into the following five groups: 29 years and under; 30-39 years; 40-49 years; 50-59 years; and 60 years or over. As shown in Table 3, 4,765 teleworkers (5.47%) were under 29 years old; 14,987 teleworkers (17.19%) were between 30 and 39 years old; 26,411 teleworkers (30.30%) were between 40 and 49 years old; 30,753 teleworkers (35.28%) were between 50 and 59 years old; and 10,250 teleworkers (11.76%) were over 60 years old.

Table 3. Distribution of the Teleworkers by Age Group

Age Group	Frequency	Percent	Cumulative Percent
29 and under	4,765	5.47	5.47
30-39	14,987	17.19	22.66
40-49	26,411	30.30	52.96
50-59	30,753	35.28	88.24
60 or over	10,250	11.76	100.00
Total	87,166	100.00	

Distribution of the Teleworkers by Volume of Teleworking

As shown in Table 4, the federal teleworkers reported their current volume of teleworking as follows: 1) 8,368 teleworkers (9.16%) teleworked 3 or more days per week; 2) 28,423 teleworkers (31.10%) teleworked 1 or 2 days per week; 3) 14,930 teleworkers (16.34%) teleworked no more than 1 or 2 days per month; and 4) 39,665 teleworkers (43.40%) teleworked very infrequently, on an unscheduled or short-term

basis. Namely, the highest percentage (43.40%) of survey respondents currently teleworked on an infrequent and irregular basis.

Table 4. Distribution of the Teleworkers by Volume of Teleworking

Volume of Teleworking	Frequency	Percent	Cumulative Percent
3 or more days per week	8,368	9.16	9.16
1 or 2 days per week	28,423	31.10	40.26
1 or 2 days per month	14,930	16.34	56.60
Very Infrequently	39,665	43.40	100.00
Total	91,386	100.00	

Distribution of the Teleworkers by Supervisory Level

The survey identified a federal employee's supervisory (managerial) level within the following three categories: 1) non-supervisors or team leaders, 2) supervisors, and 3) managers or executives. The results showed that 66,558 teleworkers, corresponding to 75.23% of the sample, were non-supervisors or team leaders; 13,182 teleworkers, corresponding to 14.90% of the sample, were supervisors; and 8,729 teleworkers, corresponding to 9.87% of the sample, were managers or executives.

Table 5. Distribution of the Teleworkers by Supervisory Level

Supervisory Level	Frequency	Percent	Cumulative Percent
Non-Supervisors/Team Leaders	66,558	75.23	75.23
Supervisors	13,182	14.90	90.13
Managers/Executives	8,729	9.87	100.00
Total	88,469	100.00	

Distribution of the Teleworkers by Tenure (Years in the Federal Government)

The participating teleworkers' tenures in the federal government were grouped into the following six categories: 1) 11,709 teleworkers, corresponding to 13.41% of the sample, had served less than 3 years; 2) 6,904 teleworkers, corresponding to 7.91% of the

sample, had served 4 to 5 years; 3) 14,681 teleworkers, corresponding to 16.82% of the sample, had served 6 to 10 years; 4) 9,416 teleworkers, corresponding to 10.79% of the sample, had served 11 to 14 years; 5) 9,938 teleworkers, corresponding to 11.39% of the sample, had served 15 to 20 years; and 6) 34,638 teleworkers, corresponding to 39.68% of the sample, had served 21 years or more in the federal government.

Table 6. Distribution of the Teleworkers by Tenure in Federal Government

Tenure in Federal Government	Frequency	Percent	Cumulative Percent
Up to 3 years	11,709	13.41	13.41
4 to 5 years	6,904	7.91	21.32
6 to 10 years	14,681	16.82	38.14
11 to 14 years	9,416	10.79	48.93
15 to 20 years	9,938	11.39	60.32
More than 20 years	34,638	39.68	100.00
Total	87,286	100.00	

Distribution of the Teleworkers by Tenure (Years in the Current Agency)

The tenures in the current agency of the teleworkers who participated in the survey were categorized into the following five groups: 1) 16,971 (19.39%) teleworkers had served less than 3 years; 2) 9,283 (10.60%) teleworkers had served 4 to 5 years; 3) 17,117 (19.55%) teleworkers had served 6 to 10 years; 4) 19,661 (22.46%) teleworkers had served 11 to 20 years; and 5) 24,513 (28%) teleworkers had served more than 20 years in their current agency.

Table 7. Distribution of the Teleworkers by Tenure in Current Agency

Tenure in Current Agency	Frequency	Percent	Cumulative Percent
Up to 3 years	16,971	19.39	19.39
4 to 5 years	9,283	10.60	29.99
6 to 10 years	17,117	19.55	49.54
11 to 20 years	19,661	22.46	72.00
More than 20 years	24,513	28.00	100.00
Total	87,545	100.00	

Distribution of the Teleworkers by Race

The study sample included 58,149 non-minority (white) teleworkers, corresponding to 67.70% of the sample, and 27,745 minority (non-white) teleworkers, corresponding to 32.30% of the sample.

Table 8. Distribution of the Teleworkers by Race

Race	Frequency	Percent	Cumulative Percent
Non-Minority	58,149	67.70	67.70
Minority	27,745	32.30	100.00
Total	85,894	100.00	

Distribution of the Teleworkers by Work Location

Of the teleworkers, 44,894 (51.04%) identified that they worked in their headquarters, whereas 43,058 (48.96%) reported that they worked in the field.

Table 9. Distribution of the Teleworkers by Work Location

Work Location	Frequency	Percent	Cumulative Percent
Headquarters	44,894	51.04	51.04
Fields	43,058	48.96	100.00
Total	87,952	100.00	

Distribution of the Participants' Responses for Teleworking Satisfaction

This section discusses the differences in the federal government teleworkers' perceptions of their satisfaction with teleworking according to their demographics, including gender, age, volume of teleworking, supervisory level, tenure (years in the federal government and years in the current agency), race and work location.

Teleworking Satisfaction

This study assessed federal employees' teleworking satisfaction, which was measured by the following survey question: "How satisfied are you with the following work/life programs in your agency? Telework" (q79) in the 2011 FEVS. As shown in the table below, the respondents who participated in the survey revealed their teleworking satisfaction on a five-point scale, ranging from 1 (very dissatisfied) to 5 (very satisfied).

Distribution of the Participants' Responses for Teleworking Satisfaction by Gender

Figure 1 and Table 10 below show the differences in teleworking satisfaction of the female and male teleworkers who participated in the survey. Of the female teleworkers, 17,895 (39.37%) and 16,893 (37.17%) indicated their teleworking satisfaction levels as satisfied and very satisfied, respectively. Of the male teleworkers, 16,751 (42.12%) and 12,927 (32.50%) described their teleworking satisfaction levels as satisfied and very satisfied, respectively. A higher percentage of the female teleworkers (7.94%; 2.69%) compared with the male teleworkers (6.75%; 2.42%) reported that they were dissatisfied and very dissatisfied with teleworking, respectively. However, overall,

most of the female and male teleworkers were satisfied or very satisfied with teleworking.

Figure 1. Teleworkers' Satisfaction with Teleworking by Gender

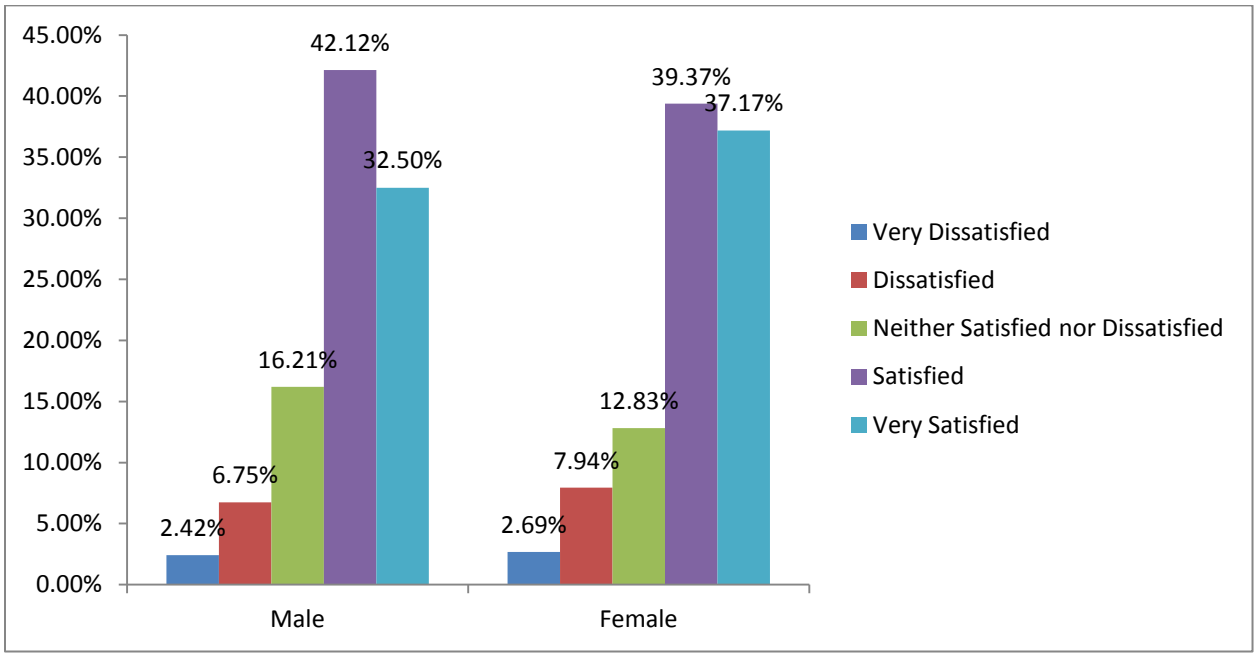

Table 10. Teleworkers' Satisfaction with Teleworking by Gender

Gender	Teleworking Satisfaction					
	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	Total
Male	961 2.42%	2,684 6.75%	6,449 16.21%	16,751 42.12%	12,927 32.50%	39,772 100.00%
Female	1,224 2.69%	3,607 7.94%	5,832 12.83%	17,895 39.37%	16,893 37.17%	45,451 100.00%
Total	2,185 2.56%	6,291 7.38%	12,281 14.41%	34,646 40.65%	29,820 34.99%	85,223 100.00%

Distribution of the Participants' Responses for Teleworking Satisfaction by Age Group

As shown in Figure 2 and Table 11, the highest percentage (41.87%) of survey respondents who were satisfied with teleworking were over 60 years old. In addition, 37.44% of the teleworkers who were under 30 years of age indicated that they were very satisfied with teleworking, representing the highest percentage among the five age groups in the sample. In contrast, the highest percentage (8.20%) of survey participants who were dissatisfied with teleworking belonged to the 30- to 39-year-old range. Furthermore, 2.93% of the teleworkers who were between 40 and 49 years old reported that they were very dissatisfied with teleworking, representing the highest percentage among the five age groups.

Figure 2. Teleworkers' Satisfaction with Teleworking by Age Group

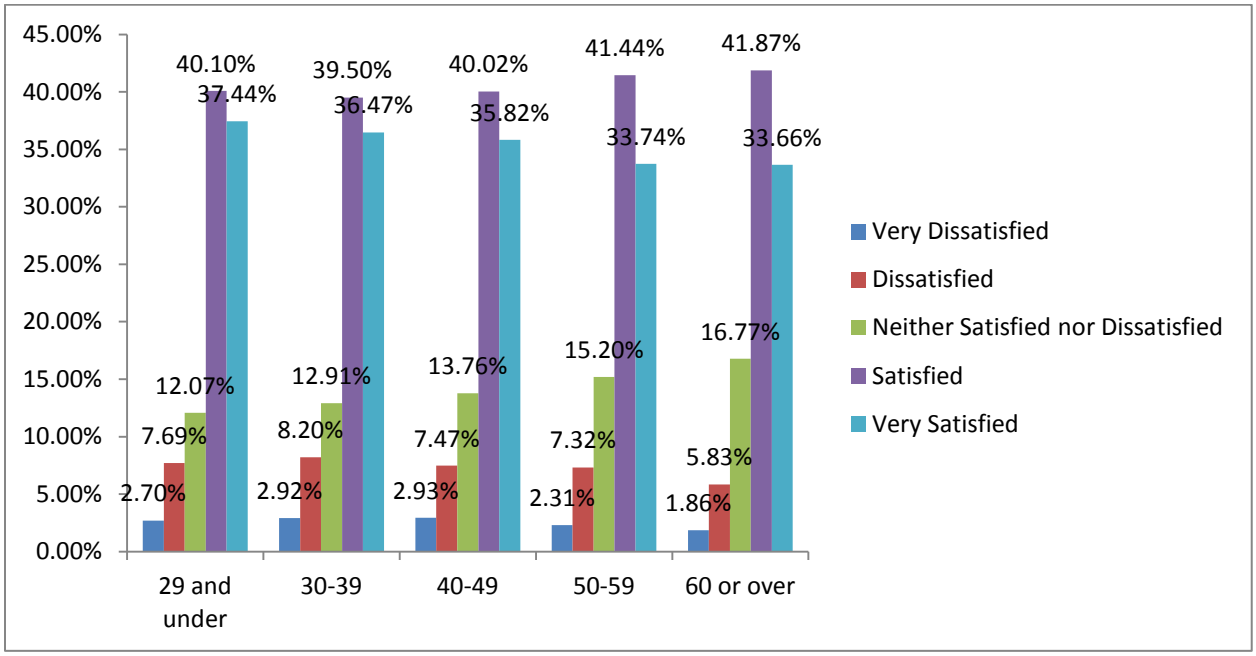

Table 11. Teleworkers' Satisfaction with Teleworking by Age Group

Age Group	Teleworking Satisfaction					
	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	Total
29 and under	124 2.70%	353 7.69%	554 12.07%	1,841 40.10%	1,719 37.44%	4,591 100.00%
30-39	425 2.92%	1,194 8.20%	1,879 12.91%	5,748 39.50%	5,307 36.47%	14,553 100.00%
40-49	754 2.93%	1,921 7.47%	3,538 13.76%	10,290 40.02%	9,211 35.82%	25,714 100.00%
50-59	687 2.31%	2,181 7.32%	4,528 15.20%	12,346 41.44%	10,051 33.74%	29,793 100.00%
60 or over	184 1.86%	577 5.83%	1,659 16.77%	4,141 41.87%	3,329 33.66%	9,890 100.00%
Total	2,174 2.57%	6,226 7.36%	12,158 14.38%	34,366 40.65%	29,617 35.03%	84,541 100.00%

Distribution of the Participants' Responses for Teleworking Satisfaction by Volume of Teleworking

As shown in Figure 12 and Table 3 below, the teleworkers who teleworked more than 3 days per week indicated that they were very satisfied with teleworking, having the highest percentage with this response (68.04%) among the four groups into which volume of teleworking was classified. In addition, 45.20% of the teleworkers who teleworked 1-2 days per month revealed that they were satisfied with their teleworking, representing the highest percentage among the four groups in the sample. By contrast, the highest percentage of teleworkers who indicated that they were dissatisfied and very dissatisfied with teleworking (10.34%; 3.76%, respectively) were those who teleworked very infrequently.

Figure 3. Teleworkers' Satisfaction with Teleworking by Volume of Teleworking

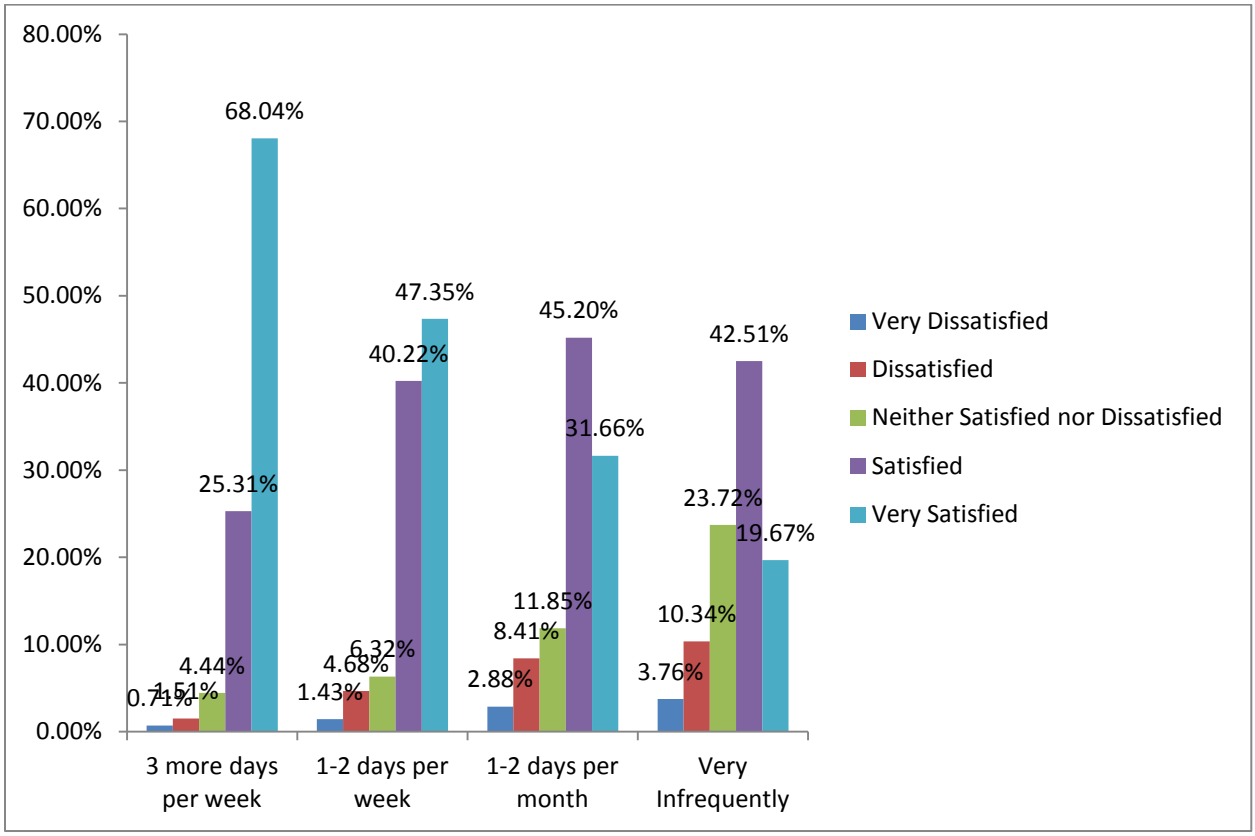

Table 12. Teleworkers' Satisfaction with Teleworking by Volume of Teleworking

Volume of Teleworking	Teleworking Satisfaction					
	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	Total
3 more days per week	58 0.71%	124 1.51%	364 4.44%	2,077 25.31%	5,583 68.04%	8,206 100.00%
1-2 days per week	403 1.43%	1,316 4.68%	1,778 6.32%	11,321 40.22%	13,327 47.35%	28,145 100.00%
1-2 days per month	423 2.88%	1,237 8.41%	1,742 11.85%	6,645 45.20%	4,654 31.66%	14,701 100.00%
Very Infrequently	1,410 3.76%	3,873 10.34%	8,884 23.72%	15,924 42.51%	7,367 19.67%	37,458 100.00%
Total	2,294 2.59%	6,550 7.40%	12,768 14.43%	35,967 40.64%	30,931 34.95%	88,510 100.00%

Distribution of the Participants' Responses for Teleworking Satisfaction by Supervisory Level

Figure 4 and Table 13 below show the differences in teleworking satisfaction according to the respondents' supervisory (managerial) levels. The highest percentage (36.35%) of survey respondents who were very satisfied with teleworking were non-supervisors or team leaders. In addition, 43.17% of the teleworking supervisors reported that they were satisfied with teleworking, representing the highest percentage among the three groups in the sample. Interestingly, the lowest percentage (6.87%; 1.66%, respectively) of teleworkers who revealed that they were dissatisfied and very dissatisfied with teleworking was reported among managers and executives.

Figure 4. Teleworkers' Satisfaction with Teleworking by Supervisory Level

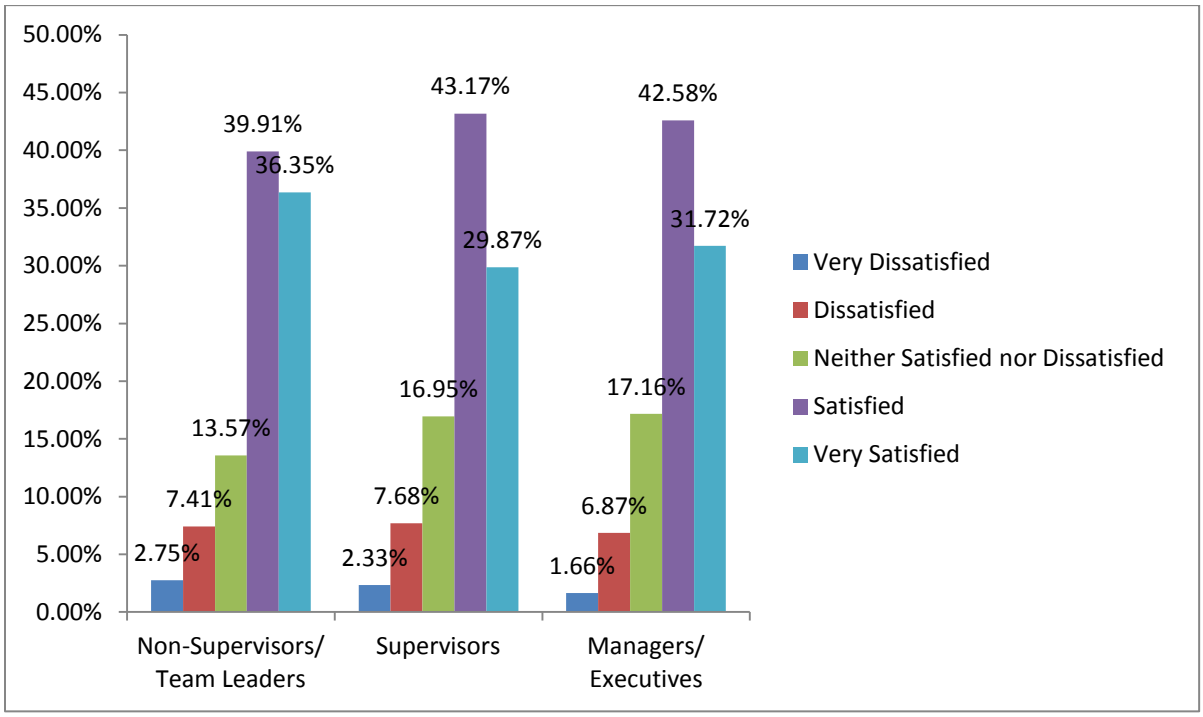

Table 13. Teleworkers' Satisfaction with Teleworking by Supervisory Level

Supervisory Level	Teleworking Satisfaction					
	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	Total
Non-Supervisors/Team Leaders	1,776 2.75%	4,786 7.41%	8,760 13.57%	25,760 39.91%	23,466 36.35%	64,548 100.00%
Supervisors	298 2.33%	982 7.68%	2,168 16.95%	5,521 43.17%	3,821 29.87%	12,790 100.00%
Managers/ Executives	141 1.66%	582 6.87%	1,454 17.16%	3,607 42.58%	2,687 31.72%	8,471 100.00%
Total	2,215 2.58%	6,350 7.40%	12,382 14.43%	34,888 40.66%	29,974 34.93%	85,809 100.00%

Distribution of the Participants' Responses for Teleworking Satisfaction by Tenure (Years in the Federal Government)

As shown in Figure 5 and Table 14 below, the highest percentage (41.15%) of survey respondents who were satisfied with teleworking were those who had served more than 20 years in the federal government. In addition, 35.54% of the teleworkers who had served 4-5 years revealed that they were very satisfied with teleworking, representing the highest percentage among the six groups of tenure years in the federal government. In contrast, the highest percentage (8.06%; 2.94%, respectively) of survey respondents who revealed that they were dissatisfied and very dissatisfied with teleworking were those who had served 15-20 years in the federal government.

Figure 5. Teleworkers' Satisfaction with Teleworking by Tenure in Federal Government

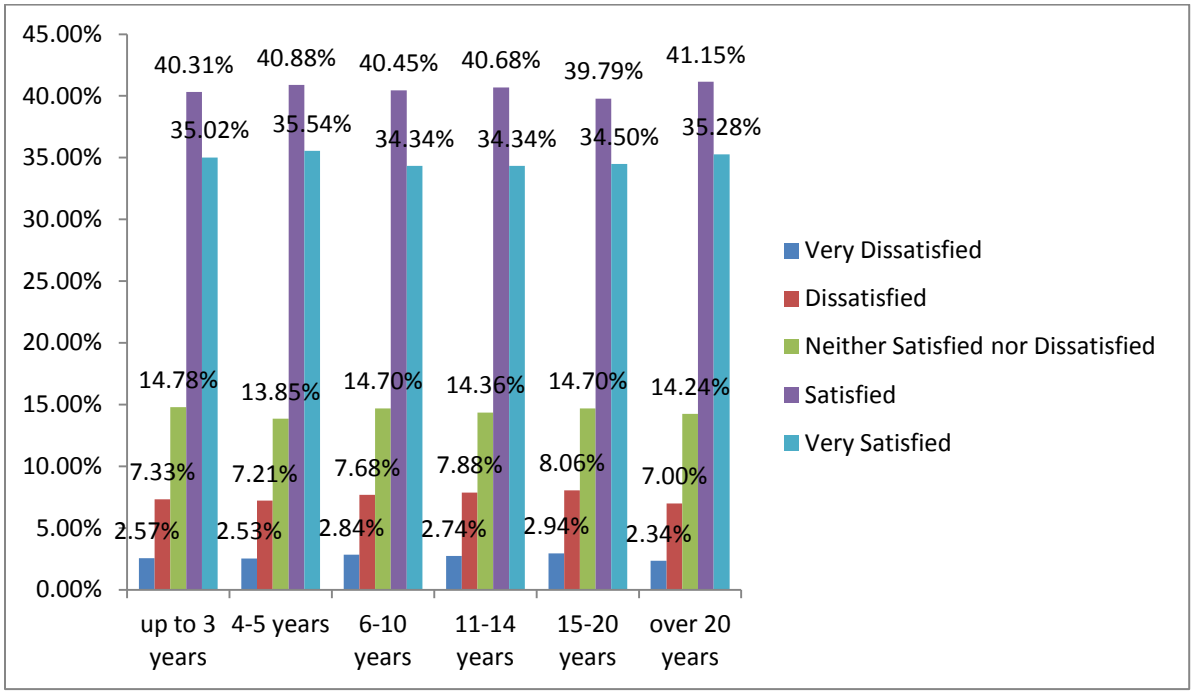

Table 14. Teleworkers' Satisfaction with Teleworking by Tenure in Federal Government

Tenure in Federal Government	Teleworking Satisfaction					
	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	Total
Up to 3 years	288 2.57%	823 7.33%	1,659 14.78%	4,526 40.31%	3,932 35.02%	11,228 100.00%
4 to 5 years	169 2.53%	482 7.21%	926 13.85%	2,734 40.88%	2,377 35.54%	6,688 100.00%
6 to 10 years	403 2.84%	1,091 7.68%	2,089 14.70%	5,749 40.45%	4,880 34.34%	14,212 100.00%
11 to 14 years	251 2.74%	721 7.88%	1,314 14.36%	3,722 40.68%	3,142 34.34%	9,150 100.00%
15 to 20 years	284 2.94%	777 8.06%	1,418 14.70%	3,838 39.79%	3,328 34.50%	9,645 100.00%
More than 20 years	788 2.34%	2,360 7.00%	4,805 14.24%	13,880 41.15%	11,901 35.28%	33,734 100.00%
Total	2,183 2.58%	6,254 7.39%	12,211 14.42%	34,449 40.69%	29,560 34.92%	84,657 100.00%

Distribution of the Participants' Responses for Teleworking Satisfaction by Tenure (Years in the Current Agency)

The highest percentages (41.84% and 35.30%, respectively) of survey respondents who indicated that they were satisfied and very satisfied with teleworking were those who had served more than 20 years in their current agency, as shown in Figure 14 and Table 23. By contrast, the highest percentage (7.95%) of survey participants who were dissatisfied with teleworking was reported by the teleworkers who had served less than 3 years in their current agency. In addition, 2.91% of the teleworkers who had served 4-5 years reported that they were very dissatisfied with teleworking, representing the highest percentage among the five groups in the sample.

Figure 6. Teleworkers' Satisfaction with Teleworking by Tenure in Current Agency

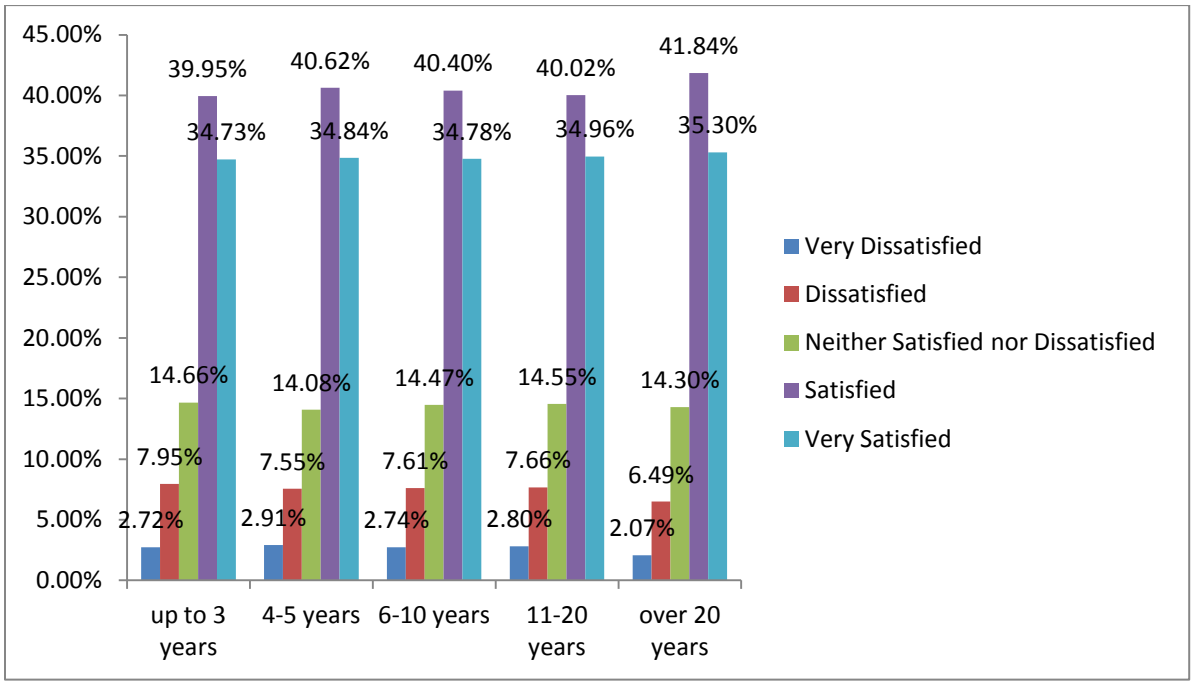

Table 15. Teleworkers' Satisfaction with Teleworking by Tenure in Current Agency

Tenure in Current Agency	Teleworking Satisfaction					
	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	Total
Up to 3 years	444 2.72%	1,298 7.95%	2,394 14.66%	6,524 39.95%	5,672 34.73%	16,322 100.00%
4 to 5 years	262 2.91%	681 7.55%	1,270 14.08%	3,663 40.62%	3,142 34.84%	9,018 100.00%
6 to 10 years	454 2.74%	1,263 7.61%	2,401 14.47%	6,702 40.40%	5,770 34.78%	16,590 100.00%
11 to 20 years	535 2.80%	1,465 7.66%	2,782 14.55%	7,651 40.02%	6,683 34.96%	19,116 100.00%
More than 20 years	495 2.07%	1,549 6.49%	3,411 14.30%	9,982 41.84%	8,421 35.30%	23,858 100.00%
Total	2,190 2.58%	6,256 7.37%	12,258 14.44%	34,522 40.66%	29,688 34.96%	84,914 100.00%

Distribution of the Participants' Responses for Teleworking Satisfaction by Race

Figure 7 and Table 16 below show that 10,704 (39.91%) and 9,857 (36.75%) of the minority teleworkers indicated their teleworking satisfaction levels as satisfied and very satisfied, respectively. Furthermore, 23,127 (40.93%) and 19,438 (34.40%) of the non-minority teleworkers indicated their teleworking satisfaction levels as satisfied and very satisfied, respectively. Overall, there were small differences in the perceived teleworking satisfaction of the non-minority and minority teleworkers in the study sample.

Figure 7. Teleworkers' Satisfaction with Teleworking by Race

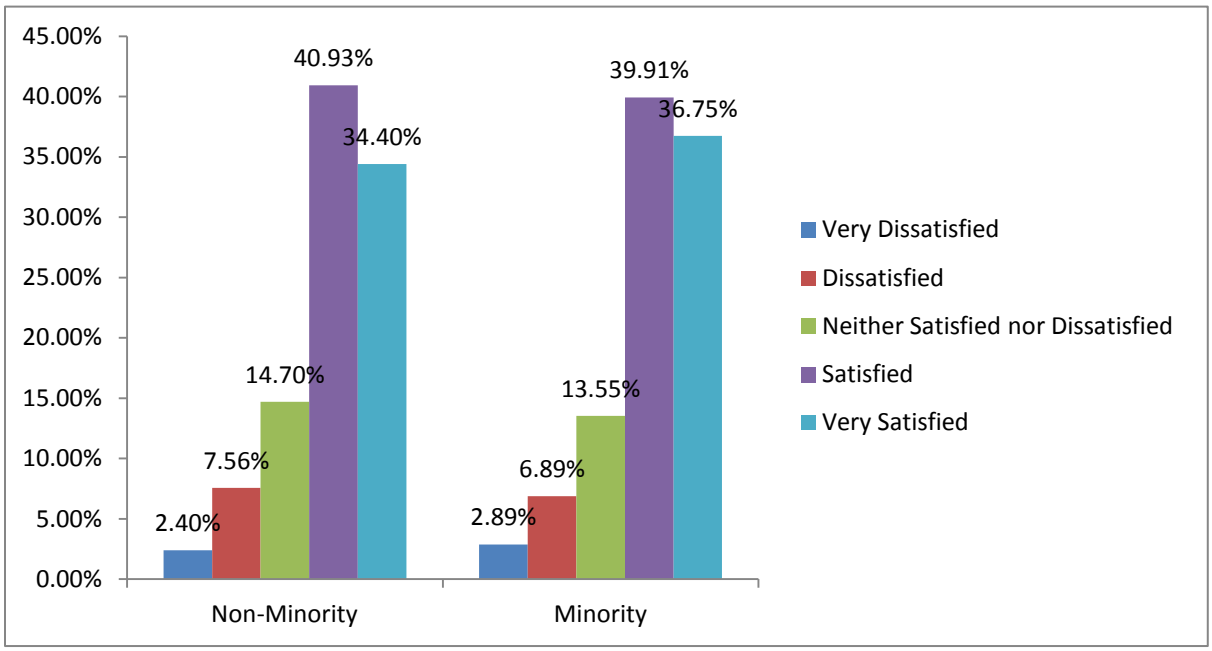

Table 16. Teleworkers' Satisfaction with Teleworking by Race

Race	Teleworking Satisfaction					
	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	Total
Non-Minority	1,357 2.40%	4,273 7.56%	8,306 14.70%	23,127 40.93%	19,438 34.40%	56,501 100.00%
Minority	776 2.89%	1,848 6.89%	3,634 13.55%	10,704 39.91%	9,857 36.75%	26,819 100.00%
Total	2,133 2.56%	6,121 7.35%	11,940 14.33%	33,831 40.60%	29,295 35.16%	83,320 100.00%

Distribution of the Participants' Responses for Teleworking Satisfaction by Work Location

Of the teleworkers who worked at headquarters, 17,930 (41.01%) and 14,772 (33.79%) indicated their teleworking satisfaction levels as satisfied and very satisfied, respectively. Of the teleworkers who worked in the field, 16,740 (40.21%) and 15,063 (36.19%) reported their teleworking satisfaction levels as satisfied and very satisfied,

respectively. A higher percentage of the teleworkers (8.23%; 2.84%) who worked at headquarters compared with the teleworkers who worked in the field (6.52%; 2.30%) reported that they were dissatisfied and very dissatisfied with teleworking, respectively, as shown in Figure 16 and Table 25.

Figure 8. Teleworkers' Satisfaction with Teleworking by Work Location

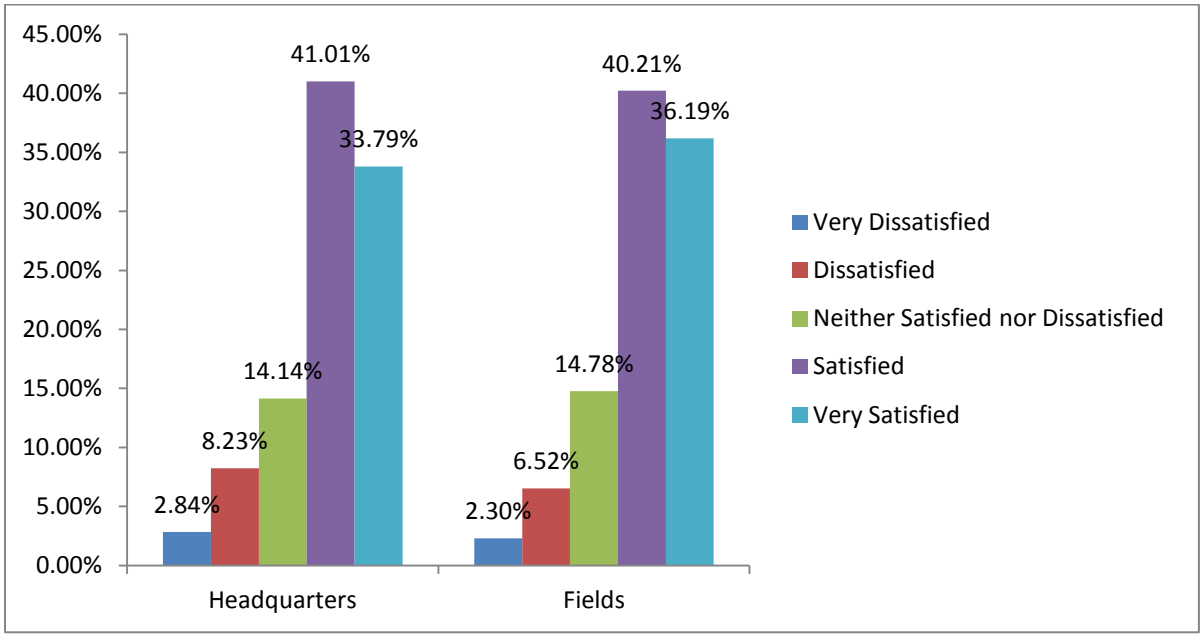

Table 17. Teleworkers' Satisfaction with Teleworking by Work Location

Location	Teleworking Satisfaction					
	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied	Total
Headquarters	1,241 2.84%	3,598 8.23%	6,182 14.14%	17,930 41.01%	14,772 33.79%	43,723 100.00%
Fields	958 2.30%	2,713 6.52%	6,153 14.78%	16,740 40.21%	15,063 36.19%	41,627 100.00%
Total	2,199 2.58%	6,311 7.39%	12,335 14.45%	34,670 40.62%	29,835 34.96%	85,350 100.00%

Statistical Analysis & Findings

Correlations of Variables

Table 18 presents the correlations of the variables employed in this study. The largest correlation was between an employee's satisfaction with child care and elder care programs (.85), indicating that these two variables were strongly correlated. In addition, the correlation between tenure in the federal government and tenure in the current agency also revealed a strong relationship (.81). However, the average and median values among those correlations were .14 and .06, respectively. Overall, the correlation table indicated no serious problem of collinearity among the independent and dependent variables in this study.

Table 18. Correlations of Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.Teleworking Satisfaction																			
2.Volume of Teleworking	-.33																		
3.Child Care Responsibility	.02	-.01[a]																	
4.Elder Care Responsibility	.02	-.02	.41																
5.Satisfaction with Child Care Program	.26	.03	.36	.17															
6.Satisfaction with Elder Care Program	.27	.00[a]	.19	.34	.85														
7.Gender	-.02	-.06	.03	.04	.02	.02													
8.Age	-.01[a]	.03	-.07	.05	.06	.03	-.07												
9.Supervisory Level	-.02	.23	-.01	-.01[a]	.09	.08	-.08	.17											
10.Tenure in Federal Government	.01[a]	.01	-.02	.04	.08	.04	.06	.54	.21										
11.Tenure in Current Agency	.02	.01[a]	-.02	.03	.07	.03	.01	.46	.18	.81									
12.Work Location	.03	-.01	-.00[a]	.00[a]	-.02	-.04	-.05	.06	-.02	.11	.14								
13.Supervisory Support	.29	.02	.01[a]	.01[a]	.14	.17	-.02	-.06	.03	-.06	-.04	.00[a]							
14.Sufficient Resource	.22	-.06	.02	.03	.15	.19	.00[a]	-.04	-.07	-.06	-.06	-.03	.28						
15.Awards for Performance	.24	.06	.01	.02	.20	.22	-.08	.01	.20	.00[a]	.01	-.00[a]	.40	.32					
16.Performance Appraisal	.22	.03	-.00[a]	.01[a]	.13	.17	-.01	-.04	.08	-.05	-.03	-.01	.45	.30	.53				
17.Leader's Integrity	.24	.07	.02	.01[a]	.18	.21	-.07	-.02	.13	-.09	-.06	-.00[a]	.42	.35	.54	.44			
18.Person-Job Fit	.24	.04	.02	.02	.17	.20	-.02	.01	.14	.02	.03	.03	.40	.37	.51	.50	.52		
19.Cooperation	.20	.04	.00[a]	.01	.15	.17	-.05	.05	.09	.04	.05	.01	.34	.29	.42	.33	.43	.41	
20.Sharing Job Knowledge	.19	.05	.00[a]	-.00[a]	.14	.16	-.07	-.00[a]	.12	-.00[a]	.02	.05	.35	.24	.48	.34	.42	.42	.58

Note: all of the coefficients, expect those marked by "a", are statistically significant at the .01 or .001 level.

Variance Inflation Factors (VIFs) Among Explanatory Variables

To examine the severity of the multicollinearity problem among the explanatory variables, especially for strongly correlated variables, this study employed a variance inflation factor (VIF) in the model. As shown in Table 19, the two highest VIF values were 4.16 (for satisfaction with elder care program) and 4.15 (for satisfaction with child care program), respectively. Because those two variables are key explanatory factors in the research questions and empirical hypotheses to be examined in this study, the statistical models used in this study retained the variables despite their slightly high VIF values. In addition, given that the average VIF value of 1.93 is lower than the typical acceptable maximum of 3.4 (Diamantopoulos & Siguaw, 2006, Caillier, 2013; Choi & Rainey, 2010), this study confirmed that there was no serious problem of multicollinearity in the analysis model. Therefore, all of the theoretically proposed independent and control variables were included in the empirical analyses.

Table 19. Variance Inflation Factors (VIFs) Among Explanatory Variables

Variable	VIF	1/VIF
Satisfaction with Elder Care Program	4.16	.240
Satisfaction with Child Care Program	4.15	.241
Tenure in Federal Government	2.90	.345
Tenure in Current Agency	2.65	.378
Awards for Performance	1.91	.524
Leader's Integrity	1.86	.539
Person-Job Fit	1.83	.545
Sharing Job Knowledge	1.78	.561
Elder Care Responsibility	1.75	.572
Child Care Responsibility	1.74	.574
Cooperation	1.70	.587
Performance Appraisal	1.69	.590
Supervisory Support	1.50	.668
Age	1.34	.744
Sufficient Resources	1.32	.757
Supervisory Level	1.21	.824
Volume of Teleworking	1.08	.930
Gender	1.07	.936
Work Location	1.03	.970
Mean VIF	1.93	

This study also examined several methodological problems and conducted a series of diagnostic tests for the existence of outliers, heteroscedasticity, multicollinearity, and nonlinear relationships among the dependent and independent variables. All of the results indicated no significant violation of the assumptions of ordinary least squares (OLS) regression. Thus, this study employed both ordered probit analysis and OLS regression to address the research questions and hypotheses.

Selection of Analysis Models for Empirical Interpretations

The current study explored the association among a teleworker's child and elder care responsibilities, satisfaction with her or his agency's dependent care programs, and volume of teleworking with her or his teleworking satisfaction. This study employed both ordered probit analysis and OLS regression because research has shown that a problematic difference in results between OLS regression and ordered probit analysis is unlikely in the case of a large-N data analysis (Dittrich, Francis, Hatzinger, & Katzenbeisser, 2007; O'Brien, 1981; Pitts, 2009).

Based on a thorough comparison of the statistical results derived from both the OLS and ordered probit models, this study confirmed that there were no significant changes in the directions and very slight changes in both the level of statistical significance and magnitude of individual coefficients between the two analyses. In particular, the key independent variables of this study, child and elder care responsibility, satisfaction with child and elder care program, and volume of teleworking, did not show significant changes. Thus, this study interpreted the statistical findings based on the OLS regression analysis because the interpretation of OLS regression results is more

straightforward or intuitive than the interpretation of an ordered probit analysis. For reference purposes, the statistical results derived from a series of ordered probit analyses are also provided in this study.

Statistical Findings Related to Hypotheses 1 and 2: Family Responsibility & 3 and 4: Satisfaction with Dependent Care Program

Table 20 (ordinary least squares regression) and Table 21 (ordered probit analysis) provide the findings related to Hypotheses 1, 2, 3, and 4. Specifically, the analyses examined whether there was a significant difference in the levels of teleworking satisfaction between teleworkers who have child or elder care responsibilities and teleworkers who do not have such dependent care obligations, representing Hypotheses 1 and 2. Furthermore, the analyses examined whether teleworkers' satisfaction levels with their child or elder care programs are significantly and positively associated with their levels of satisfaction with teleworking in the United States federal government, representing Hypotheses 3 and 4.

Because the study coded 1 for teleworkers who reported that they have child care responsibilities as a reference group and coded 0 for teleworkers who reported that they do not have such responsibilities, the coefficient of the child care responsibility variable represents the perceived difference in teleworking satisfaction levels between the two groups of teleworkers. As presented in Table 20, therefore, the federal teleworkers who have child care responsibilities (i.e., participate in the child care program) reported lower levels of satisfaction with teleworking than did the teleworkers who do not have such responsibilities. The coefficient (-.113) was also statistically significant at the .001 level,

thereby providing support for Hypothesis 1, which assumed that teleworkers without child care obligations (in comparison to teleworkers with child care obligations) would report that they are more satisfied with teleworking.

In a similar vein, the study also coded 1 for teleworkers who reported that they have elder care responsibilities as a reference group and coded 0 for teleworkers who reported that they do not have such responsibilities, so the coefficient of the elder care responsibility variable in the model identifies the perceived difference in teleworking satisfaction levels between the two groups of federal teleworkers. The result from Table 20 suggests that teleworkers who have elder care demands (i.e., participate in the elder care program) reported lower levels of satisfaction with teleworking than did teleworkers who do not have such responsibilities. The coefficient (-.097) was also statistically significant at the .05 level, thereby demonstrating support for Hypothesis 2, which assumed that teleworkers without elder care obligations would report that they are more satisfied with teleworking compared with teleworkers with elder care obligations.

The empirical findings support the arguments regarding a negative association between an employee's dependent family care responsibilities and her or his satisfaction with teleworking due to some degree of interruption and less ability to concentrate while working at home resulting from the difficulty of effectively controlling work and family schedules and the permeable boundary between work duties and family care demands, as discussed in previous studies (e.g., Lee & Hong, 2011; Salaff, 2002; Maruyama et al., 2009; Saltzstein et al., 2001; Caillier, 2013; Julien et al., 2011, etc.).

Regarding the test of Hypotheses 3 and 4, the results shown in Table 20 show that the federal teleworkers with higher levels of satisfaction with their child and elder care

programs were more likely to exhibit higher levels of teleworking satisfaction. The coefficients (.161 for satisfaction with the child care program; .159 for satisfaction with the elder care program) were also statistically significant at the .001 level, thereby providing support for Hypotheses 3 and 4, which assumed a positive association between a teleworker's teleworking satisfaction and her or his level of satisfaction with a child and elder care program. The empirical findings also imply that federal agencies are likely to have higher teleworkers' satisfaction with teleworking when the teleworkers are satisfied with the dependent care programs provided by the federal government.

The empirical results also correspond to the arguments from several studies that supported a positive relationship between employees' levels of job satisfaction and their satisfaction with the family care programs provided by their organizations or employers (e.g., Gould-Williams & Davies, 2005; Aryee et al., 2002; Caillier, 2013; Julien et al., 2011; Pierce & Newstrom, 1980, etc.). As shown in Table 20 and Table 21, there were no significant changes in either the direction or the level of statistical significance for the key independent variables (e.g., child and elder care responsibilities and satisfaction with child and elder care programs) between the two analyses.

Table 20. Results of Ordinary Least Squares Regression on Satisfaction with Teleworking: Family Responsibility & Satisfaction with Dependent Care Program

	Coefficient (Standard Errors)
Independent Variables	
Child Care Responsibility	-.113 (.039)***
Elder Care Responsibility	-.097 (.043)*
Satisfaction with Child Care Program	.161 (.022)***
Satisfaction with Elder Care Program	.159 (.030)***
Demographic Factors	
Volume of Teleworking	-.317 (.011)***
Gender	.054 (.013)***
Age	.016 (.010)
Supervisory Level	-.003 (.013)
Tenure in Federal Government	.007 (.008)
Tenure in Current Agency	.009 (.009)
Work Location	-.000 (.024)
Organizational Factors	
Supervisory Support	.172 (.015)***
Sufficient Resources	.046 (.006)***
Awards for Performance	.048 (.009)***
Performance Appraisal	.024 (.010)*
Leaders' Integrity	.076 (.008)***
Person-Job Fit	.034 (.008)***
Cooperation	.038 (.010)***
Sharing Job Knowledge	.001 (.013)
Adjusted R^2	.2731
F-Statistic	636.95
Prob>F	.000
N of Cases	17370

*p < .05, **p < .01, ***p < .001

The numbers in parentheses refer to standard errors.

Table 21. Results of Ordered Probit Analysis on Satisfaction with Teleworking: Family Responsibility & Satisfaction with Dependent Care Program

	Coefficient (Standard Errors)
Independent Variables	
Child Care Responsibility	-.163 (.055)***
Elder Care Responsibility	-.131 (.055)*
Satisfaction with Child Care Program	.226 (.028)***
Satisfaction with Elder Care Program	.254 (.042)***
Demographic Factors	
Volume of Teleworking	-.446 (.015)***
Gender	.087 (.017)***
Age	.012 (.014)
Supervisory Level	-.010 (.017)
Tenure in Federal Government	.014 (.010)
Tenure in Current Agency	.008 (.011)
Work Location	-.005 (.030)
Organizational Factors	
Supervisory Support	.215 (.017)***
Sufficient Resources	.065 (.008)***
Awards for Performance	.060 (.012)***
Performance Appraisal	.030 (.011)***
Leaders' Integrity	.099 (.010)***
Person-Job Fit	.041 .(010)***
Cooperation	.054 (.013)***
Sharing Job Knowledge	.011 (.017)
Pseudo R^2	.1306
Log pseudolikelihood	-19867.141
Wald X^2	18448.69
Prob>X^2	.000
N of Cases	17370

*p < .05, **p < .01, ***p < .001

The numbers in parentheses refer to standard errors.

Statistical Findings Related to Hypotheses 5, 6 and 7: Volume of Teleworking

Table 22 (ordinary least squares regression) and Table 23 (ordered probit analysis) provide the findings related to Hypotheses 5, 6, and 7, which assumed that teleworkers' levels of satisfaction with teleworking would be different according to their volumes (frequency) of teleworking. Specifically, the analyses examined whether the federal teleworkers who telework 1 or 2 days per week are likely to exhibit higher levels of teleworking satisfaction compared with teleworkers who telework 3 or more days per week, representing Hypothesis 5 (Model 1); teleworkers who telework 1 or 2 days per month, representing Hypothesis 6 (Model 2); and teleworkers who telework very infrequently on an unscheduled or short-term basis, representing Hypothesis 7 (Model 3).

Because this study coded 1 for the teleworkers who telework 1 or 2 days per week as a reference group and coded 0 for the teleworkers who have one of the three other volumes of teleworking, the coefficients of the volume of teleworking variable in Models 1, 2, and 3 indicate the difference in the teleworking satisfaction level between the reference group and the other three groups (volumes) of federal teleworkers.

As shown in Table 22, the federal teleworkers who telework 1 or 2 days per week eereported lower levels of satisfaction with teleworking than the teleworkers who telework 3 or more days per week in Model 1. The coefficient (-.243) was statistically significant at the .001 level; therefore, the result does not support Hypothesis 5. Furthermore, the federal teleworkers who telework 1 or 2 days per week (in comparison to the teleworkers who telework 1 or 2 days per month) exhibited higher levels of teleworking satisfaction in Model 2. The coefficient (.378) was also statistically significant at the .001 level; therefore, this finding supports Hypothesis 6. Finally, the

federal teleworkers who telework 1 or 2 days per week reported higher levels of satisfaction with teleworking compared with the teleworkers who telework very infrequently on an unscheduled or short-term basis in Model 3. The coefficient (.690) was statistically significant at the .001 level, thereby demonstrating support for Hypothesis 7.

The findings from the empirical tests for Hypotheses 5, 6, and 7 also support the arguments regarding a positive association between teleworkers' volume (frequency) of teleworking and their teleworking satisfaction levels because of their greater autonomy to control their work schedules and places and their higher perceptions of organizational support for their demands for a work-life balance (e.g., Eisenberger et al., 2001; Maruyama et al., 2009; Guimaraes & Dallow, 1999; Julien et al., 2011, etc.).

Several possible explanations exist for the discrepancy between Golden's (2006) curvilinear inverted U-shape between volume (frequency) of teleworking and teleworkers' job satisfaction and the empirical findings of my research. First, my research used the four categories of volume of teleworking, while Golden's study included and examined an exact number of days or hours of teleworking per week. Second, Golden's sample included employees from a single private company, while my sample included full-time, permanent U.S. federal employees of all 29 departments and large agencies and 54 small and independent agencies. Third, Golden (2006) used data collected in 2002, while I used 2011 federal government data. Over the last 10 years, it is likely that technology systems and equipment for telework have improved, which could have reduced the negative influence of excessive reliance on telework, including feelings of isolation and invisible interactions and disconnectedness with colleagues and

organizations as Golden found. Fourth, my research included organizational factors that represented intra-group relationships, organizational effectiveness, and supervisor relationship as controls, which could account for the expected inefficiency of teleworking.

As presented in Table 22 and Table 23, there were no significant changes in either the direction or the level of statistical significance for the key independent variable of volume of teleworking between the two analyses.

Table 22. Results of Ordinary Least Squares Regression on Satisfaction with Teleworking: Volume of Teleworking

	Model 1	Model 2	Model 3
	Coefficient (Standard Errors)	Coefficient (Standard Errors)	Coefficient (Standard Errors)
Independent Variables			
Volume of Teleworking	-.243 (.026)***	.378 (.021)***	.690 (.020)***
Demographic Factors			
Gender	.070 (.013)***	.046 (.013)***	.051 (.010)***
Age	-.003 (.009)	-.003 (.009)	.010 (.008)
Supervisory Level	-.018 (.017)	.019 (.012)	.023 (.012)
Tenure in Federal Government	.007 (.004)	.002 (.004)	.006 (.005)
Tenure in Current Agency	.007 (.007)	.008 (.010)	.008 (.007)
Work Location	.046 (.021)*	.077 (.026)***	.052 (.031)
Organizational Factors			
Supervisory Support	.179 (.011)***	.203 (.009)***	.193 (.007)***
Sufficient Resources	.051 (.005)***	.054 (.005)***	.058 (.005)***
Awards for Performance	.024 (.004)***	.044 (.006)***	.057 (.005)***
Performance Appraisal	.022 (.006)***	.019 (.007)***	.026 (.007)***
Leaders' Integrity	.057 (.008)***	.068 (.009)***	.070 (.009)***
Person-Job Fit	.033 (.006)***	.043 (.007)***	.041 (.006)***
Cooperation	.043 (.007)***	.046 (.007)***	.041 (.007)***
Sharing Job Knowledge	.015 (.009)	.006 (.008)	.011 (.005)*
Adjusted R^2	.1649	.1827	.2271
F-Statistic	216.36	547.72	481.72
Prob>F	.000	.000	.000
N of Cases	27689	33170	51439

*p < .05, **p < .01, ***p < .001

The numbers in parentheses refer to standard errors.

Model 1: Volume of Teleworking coded 0 for teleworkers who telework 3 or more days per week; 1 for teleworkers who telework 1 or 2 days per week- Reference Group

Model 2: Volume of Teleworking coded 0 for teleworkers who telework 1 or 2 days per month; 1 for teleworkers who telework 1 or 2 days per week- Reference Group

Model 3: Volume of Teleworking coded 0 for teleworkers who telework very infrequently, on an unscheduled or short-term basis; 1 for teleworkers who telework 1 or 2 days per week- Reference Group

Table 23. Results of Ordered Probit Analysis on Satisfaction with Teleworking: Volume of Teleworking

	Model 1	Model 2	Model 3
	Coefficient (Standard Errors)	Coefficient (Standard Errors)	Coefficient (Standard Errors)
Independent Variables			
Volume of Teleworking	-.451 (.054)***	.510 (.021)***	.907 (.021)***
Demographic Factors			
Gender	.128 (.022)***	.078 (.019)***	.080 (.013)***
Age	-.010 (.015)	-.012 (.012)	.004 (.010)
Supervisory Level	-.036 (.026)	.015 (.018)	.025 (.014)
Tenure in Federal Government	.016 (.007)*	.010 (.006)	.013 (.006)*
Tenure in Current Agency	.010 (.012)	.007 (.012)	.005 (.009)
Work Location	.066 (.034)	.101 (.037)***	.063 (.039)
Organizational Factors			
Supervisory Support	.236 (.011)***	.246 (.010)***	.229 (.007)***
Sufficient Resources	.078 (.007)***	.075 (.006)***	.074 (.006)***
Awards for Performance	.030 (.007)***	.051 (.007)***	.066 (.006)***
Performance Appraisal	.038 (.007)***	.030 (.008)***	.036 (.008)***
Leaders' Integrity	.087 (.011)***	.091 (.011)***	.088 (.010)***
Person-Job Fit	.048 (.008)***	.059 (.009)***	.050 (.007)***
Cooperation	.073 (.010)***	.067 (.008)***	.055 (.009)***
Sharing Job Knowledge	.024 (.012)*	.014 (.010)	.020 (.007)**
Pseudo R^2	.0860	.0856	.1034
Log pseudolikelihood	-26595.265	-35486.42	-60796.665
Wald X^2	3956.23	14211.93	10560.85
Prob>X^2	.000	.000	.000
N of Cases	27689	33170	51439

*p < .05, **p < .01, ***p < .001

The numbers in parentheses refer to standard errors.

Model 1: Volume of Teleworking coded 0 for teleworkers who telework 3 or more days per week; 1 for teleworkers who telework 1 or 2 days per week- Reference Group

Model 2: Volume of Teleworking coded 0 for teleworkers who telework 1 or 2 days per month; 1 for teleworkers who telework 1 or 2 days per week- Reference Group

Model 3: Volume of Teleworking coded 0 for teleworkers who telework very infrequently, on an unscheduled or short-term basis; 1 for teleworkers who telework 1 or 2 days per week- Reference Group

Control Variables—Demographic & Organizational Factors

The employee demographic control factors included a federal teleworker's volume of teleworking, gender, age, supervisory level, work location, years in federal government and years in the current agency. The OLS regression results suggest that female teleworkers had higher levels of teleworking satisfaction than male teleworkers in all of the regression models in this study (the coefficients were.054 in Table 20; .070 in Model 1; .046 in Model 2; and .051 in Model 3 in Table 22). Additionally, the coefficients representing the difference in teleworking satisfaction between female and male teleworkers were all statistically significant at the .001 significance level. As discussed previously, this result confirms that female employees are likely to have a more positive association between flexible work arrangements (e.g., teleworking) and satisfaction with the job than male employees, and female employees are likely to be more sensitive to and have a greater appreciation for their organizations or employers' support for family-friendly policies than male employees (Scandura & Lankau, 1997; Major et al., 2008; Caillier, 2012; Mathieu & Zajac, 1990). Thus, this finding can be interpreted such that female employees' more positive attitudes and perceptions regarding their teleworking arrangements are likely to influence them to exhibit higher levels of satisfaction with teleworking.

In addition, the volume of teleworking was included as a control variable in the model of family responsibility (Table 20). The coefficient of -.317 ($p<.001$) shows that federal teleworkers with higher volumes of teleworking were more likely to exhibit higher levels of satisfaction with teleworking. This result also corresponds to the findings from the model regarding the volume of teleworking (Table 22 & 23), demonstrating

support for Hypotheses 6 and 7 and not supporting Hypothesis 5, as discussed previously. Regarding the work location factor, the result suggests that federal teleworkers who work in the field reported higher levels of teleworking satisfaction than federal teleworkers who work at headquarters (the coefficients were .046, $p<.05$ in Model 1 and .077, $p<.001$ in Model 2 in Table 22). The other demographic control variables, including age, supervisory level, years of tenure in federal government and years of tenure in the current agency, did not show any significant relationships with the dependent variable of satisfaction with teleworking.

Based on previous job satisfaction research (e.g., Caillier, 2012 & 2013; Pitts, 2009; Fernandez, 2008; Moynihan & Pandey, 2007), several organizational factors or constraints that may influence employees' satisfaction with job were included in the models as control variables, as follows: 1) supervisory support, 2) sufficient resources, 3) awards for performance, 4) performance appraisal, 5) leaders' integrity, 6) person-job fit, 7) cooperation, and 8) sharing job knowledge. As demonstrated in the models above, all of these variables except for the sharing job knowledge factor were positively and significantly correlated with the employees' satisfaction with teleworking at the .001 significance level. Namely, the results imply that federal agencies are likely to have teleworkers with higher levels of satisfaction with teleworking when the employees are satisfied with the organizational factors that were included in the model. Regarding the magnitudes of the organizational control factors, the extent to which employees perceived that their supervisors support their need to balance work and life issues showed the highest and significant correlation with their levels of satisfaction with teleworking. In contrast, the degree to which employees perceived that their performance is fairly

reflected by their appraisals revealed the lowest significant association with employees' teleworking satisfaction among the organizational variables examined in this study.

Methodological Contributions of the Study

First, this study primarily focuses on all U.S. federal government agencies rather than particular agencies with regard to the status of telework. As mentioned above, this study utilizes the 2011 FEVS to examine the research questions and hypotheses of this study. The survey included full-time, permanent federal employees from 83 agencies, which comprised approximately 97 percent of the executive branch workforce and small/independent agencies (OPM, 2011). This methodology assumes that the study is investigating a heterogeneous population with a wide range of missions and responsibilities pursued by their respective federal agencies. Therefore, as Julien et al. (2011) discussed, the empirical results from this study might be more generalizable than those of previous work-life conflict studies that focused on small, homogenous samples from public organizations, such as police officers (Burke, 1988), nurses (Havlovic, Lau & Pinfield, 2002), and female healthcare professionals (Thomas & Ganster, 1995).

Second, this study relies on employee-level (i.e., individual-level) data rather than agency-level analysis. In doing so, the empirical results of this study are able to address the fundamental limitations of previous studies, which used organization-level data (e.g., Lee & Hong, 2011) that were unable to fully capture the complicated association between teleworking and job satisfaction (Durst, 1999). Given that the influences of such family-friendly policies might significantly differ according to employees' demographic and family-structure conditions such as, gender, age, number of dependent children, material

status, spouse's employment status (Saltzstein et al., 2001), the empirical findings of this study can contribute to the teleworking scholarship in the public sector through such individual-level analysis.

Summary

Table 24 presents the results of the test of the proposed hypotheses according to the above OLS regression analyses.

Table 24. Results of Hypotheses Tests

Hypothesis	Result
Hypothesis 1: Teleworkers who do not have child care responsibilities will report higher levels of satisfaction with teleworking than teleworkers who have child care responsibilities.	Supported
Hypothesis 2: Teleworkers who do not have elder care responsibilities will report higher levels of satisfaction with teleworking than teleworkers who have elder care responsibilities.	Supported
Hypothesis 3: Satisfaction with child care programs will be positively related to satisfaction with teleworking.	Supported
Hypothesis 4: Satisfaction with elder care programs will be positively related to satisfaction with teleworking.	Supported
Hypothesis 5: Teleworkers who telework 1 or 2 days per week will report higher levels of satisfaction with teleworking than teleworkers who telework 3 or more days per week.	Not Supported
Hypothesis 6: Teleworkers who telework 1 or 2 days per week will report higher levels of satisfaction with teleworking than teleworkers who telework 1 or 2 days per month.	Supported
Hypothesis 7: Teleworkers who telework 1 or 2 days per week will report higher levels of satisfaction with teleworking than teleworkers who telework very infrequently on an unscheduled or short-term basis.	Supported

CHAPTER 5

DISCUSSION & CONCLUSIONS

Introduction

This chapter will include a summary of the statistical findings, the implications of the study findings in terms of theoretical, methodological, and managerial perspectives, and the limitations of the study. Finally, this chapter will provide some suggestions for future research.

Summary of Empirical Findings

This study primarily aimed to provide a better understanding of the factors that influence teleworkers' satisfaction with teleworking in U.S. federal agencies. Specifically, this study empirically tested and examined how and to what extent federal government teleworkers' family responsibilities (i.e., child and elder care obligations), satisfaction levels with the dependent care programs provided by their organizations, and volume (frequency) of teleworking are associated with their levels of satisfaction with teleworking. To address these questions, this study conducted both OLS regressions and ordered probit analyses. The empirical findings are summarized below.

First, regarding the association between a teleworker's family responsibilities and her or his satisfaction with teleworking, the empirical findings of this study confirmed that federal teleworkers who have child and elder care obligations exhibited lower levels of teleworking satisfaction than did the teleworkers who do not have such obligations. The correlations were statistically significant at the .001 and .05 levels, respectively. Thus, the results supported Hypotheses 1 and 2.

Second, with respect to the relationship between a teleworker's level of satisfaction with the dependent care programs provided by her or his organization and teleworking satisfaction, this study found that the federal teleworkers with higher levels of satisfaction with their child and elder care programs reported higher levels of teleworking satisfaction. The correlations were statistically significant at the .001 level. Thus, the results also supported Hypotheses 3 and 4, which assumed a positive association between a teleworker's satisfaction with dependent care programs and teleworking.

Third, to explore the link between a teleworker's satisfaction with teleworking and the volume (frequency) of teleworking, this study compared the different levels of teleworking satisfaction among federal teleworkers grouped by four scales of their volume of teleworking. The empirical results showed that federal teleworkers who telework 1 or 2 days per week reported higher levels of teleworking satisfaction compared with teleworkers who telework 1 or 2 days per month and teleworkers who telework very infrequently on an unscheduled or short-term basis. However, teleworkers who telework 1 or 2 days per week exhibited lower levels of satisfaction with teleworking than the teleworkers who telework 3 or more days per week. The correlations were all statistically significant at the .001 level. Therefore, the results of this study supported Hypotheses 7 and 8 and did not support Hypothesis 5.

Fourth, this study also controlled for teleworkers' demographic characteristics and organizational factors in the analysis. The results suggested that female teleworkers had higher levels of teleworking satisfaction than male teleworkers in all of the regression models in the study. The other demographic control variables, such as age, supervisory

level, years of tenure in the federal government and years of tenure in the current agency, did not provide significant associations with the dependent variable of teleworking satisfaction. In addition, all of the organizational factors included in the models except for the sharing job knowledge variable were positively and significantly associated with the federal teleworkers' levels of satisfaction with teleworking.

Implications of the Study Results

Theoretical Implications

Based on a thorough literature review, many studies have explored how and to what extent teleworking arrangements influence an employee's perceived levels of job satisfaction, performance, work-life balance and organizational commitment. However, very few studies have particularly focused on federal teleworkers' satisfaction with teleworking itself. Specifically, the extant teleworking literature has not provided in-depth discussions or empirical evidence regarding the factors that are significantly associated with federal teleworkers' level of satisfaction with teleworking.

The research questions and hypotheses in this study were formulated to address the theoretical and empirical gaps in the current teleworking and family-friendly policy literature on the public sector. Accordingly, this study mainly focuses on gaining a better understating of what factors influence teleworkers' satisfaction with teleworking in United States federal agencies. Specifically, based on the literature review, the dissertation empirically tested and examined how and to what extent federal government teleworkers' family responsibilities (i.e., child and elder care obligations), satisfaction levels with the child and elder dependent care programs provided by their federal

agencies, and volume (frequency) of teleworking are significantly associated with their teleworking satisfaction levels. Finally, according to its empirical findings, this study discussed how the extent to which federal teleworkers are satisfied with their teleworking was influenced by their satisfaction with dependent care programs as well as compared the teleworkers' teleworking satisfaction levels by whether or not having family care responsibilities and volume (frequency) of their teleworking arrangement.

Overall, the study's findings and its implications can advance the previous teleworking literature, which has only compared the different impacts of teleworking implementation on outcome variables within or across a variety of employee demographics and family-structured conditions (e.g., Saltzstein et al., 2001; Scandura & Lankau, 1997; Maruyama et al., 2009; Kossek et al., 2006; Lee & Hong, 2010, etc.), without a comprehensive discussion of theoretical or empirical evidence regarding the factors that might have influential relationships on teleworkers' teleworking satisfaction in public organizations.

In addition, this study provided empirical evidence on the factors that influence teleworkers' satisfaction with teleworking through an analysis of United States federal government agencies. Many studies have focused on teleworking and its related outcomes using data from state, local or other public organizations, but not data from the federal level. Therefore, this study contributes to the teleworking scholarship.

Based on the teleworking literature review and empirical findings, this study provides several topics for future research that could theoretically contribute to the extant teleworking and family-friendly policy literature. For instance, beyond the context of teleworking arrangements and a federal teleworker's satisfaction with teleworking

explored in this study, future research could investigate the factors that influence federal employees' levels of satisfaction with other types of alternative work schedules (e.g., compressed work weeks, flexible work schedules, and part-time work) or could explore the association between federal teleworkers' teleworking satisfaction and their perceived levels for other work-related outcome variables (e.g., performance, turnover intention, organizational commitment, and work-family or work-life balance) to contribute to the body of family-friendly policy scholarship.

Methodological Implications

As previously discussed, the employee-level (i.e., individual level) analysis that was applied in this study aimed to address the fundamental limitations of previous teleworking studies, which have utilized organization-level (i.e., agency level) analyses. The current research aimed to capture the factors (e.g., a teleworker's family responsibilities, satisfaction with dependent care programs, and volume of teleworking) that have significant associations with federal teleworkers' levels of satisfaction with teleworking. Thus, an individual level of analysis is more straightforward than an agency-level analysis in supporting the nature of the aforementioned association (Lee & Hong, 2011; Durst, 1999; Saltzstein et al., 2001), and providing intuitive implications concerning the implementation of teleworking programs to the public sectors.

The analysis models in this study focused on teleworkers (regardless of gender, age, and the extent (volume) to which they utilized the teleworking arrangement) in most United States federal government agencies that participated in the 2011 FEVS, rather than for particular and grouped agencies. Namely, this study was able to explore

heterogeneous federal employees with a wide range of missions and job responsibilities required by their respective organizations. Therefore, the current study's empirical findings might be more generalizable to public sectors (Julien et al., 2011) than those of similar studies with limited small samples of particular and homogenous public employees (e.g., Burke, 1988; Havlovic et al., 2002; Thomas & Ganster, 1995).

This study was able to compare federal teleworkers' relatively different levels of satisfaction with their teleworking according to their volume (frequency) of teleworking and whether they have family responsibilities (i.e., dependent care obligations) by including both a reference group (coded 1) and a comparison group of teleworkers (coded 0) in each of the regression models. By doing so, the research design and model specification also contribute to the extant teleworking and family-friendly literature.

Managerial Implications

In addition to the theoretical implications and methodological contributions discussed above, this study can also provide managerial and practical implications of teleworking programs. The empirical findings of this study can benefit public managers, supervisors and top teleworking managers, such as the Teleworking Managing Officer (TMO), who is primarily involved in implementing a federal agency's teleworking arrangement. Specifically, the empirical analysis that was conducted in this study addressed the following substantial questions: 1) Are federal teleworkers' levels of satisfaction with teleworking significantly different for teleworkers who have family responsibilities (i.e., child and elder care obligations) and teleworkers who do not have such responsibilities? 2) Are federal teleworkers' satisfaction with the child and elder

dependent care programs provided by their organizations significantly associated with their teleworking satisfaction levels? and 3) Are federal teleworkers' levels of satisfaction with teleworking significantly different by their volume (frequency) of teleworking?

The empirical findings of this study confirmed that the federal teleworkers who have child and elder care obligations exhibited lower levels of teleworking satisfaction than the teleworkers who do not have such obligations. This result may indicate that having dependent care responsibilities negatively influences the teleworkers' teleworking satisfaction levels. In particular, one of the policy goals/benefits of the implementation of a teleworking program is to help employees balance their work and family responsibilities (i.e., dependent care obligations); however, teleworkers with child or elder care responsibilities reported lower levels of teleworking satisfaction in this study compared with teleworkers without dependent care obligations. This result may demonstrate that the current teleworking program does not fully address federal employees' growing needs for dependent care and a work-life balance.

Regard this aspect, Major et al.(2008) suggested that federal organizations need to specify that the key purpose of a teleworking program is to assist employees' with their dependent care needs or family responsibilities and to ensure that they can address such needs through the implementation of a teleworking arrangement. In a similar vein, employees should be allowed to request the ability to telework from their managers or organizations because of dependent care obligations, and they should be allowed to select which days and/or how many hours they need to telework to fulfill their family responsibilities given the increased flexibility of a teleworking arrangement.

In addition, this study confirmed that federal teleworkers with higher levels of satisfaction with their child and elder care programs reported higher levels of teleworking satisfaction. In particular, employees who perceive that their child and elder care needs are well supported by their employers are likely to exhibit higher levels of satisfaction with teleworking. This finding may also indicate that federal agencies are likely to have higher employee satisfaction with teleworking when the teleworkers are satisfied with the dependent care programs provided by the federal government.

Based on the empirical findings of this study, a federal agency's support for an employee's child and elder dependent care program is necessary to assist teleworkers to balance the responsibilities of their work duties and dependent care as well as to help them achieve enhanced levels of satisfaction with teleworking. In addition, the tests of the hypotheses in this study suggest that mere participation in a teleworking arrangement by itself does not influence an employee's job satisfaction or address her or his dependent care needs. In particular, according to this study, the two factors of having dependent care obligations and the teleworker's satisfaction level with the child and elder care programs are significant variables influencing federal teleworkers' satisfaction with teleworking.

Finally, regarding the relationship between the volume (frequency) of teleworking and satisfaction with teleworking, the empirical findings from this study suggested that federal teleworkers who telework 1 or 2 days per week reported higher levels of teleworking satisfaction compared with teleworkers who telework 1 or 2 days per month and teleworkers who telework very infrequently on an unscheduled or short-term basis. However, teleworkers who telework 1 or 2 days per week exhibited lower levels of satisfaction with teleworking than teleworkers who telework 3 or more days per week.

Therefore, this study suggested that the federal teleworkers who telework on a more frequent basis are likely to exhibit higher levels of satisfaction with teleworking.

According to the OPM (2011), 25.7% of federal employees reported that they do not telework because they had not received approval for teleworking from their organizations or managers, and 6.8% of the respondents reported that they do not telework due to technical problems or a lack of technical support in their agencies. In other words, many federal employees currently cannot utilize a teleworking program because of a lack of approval or technical restrictions, even though they want to telework to perform their job duties.

Regarding this aspect, Major et al. (2008) noted that it is essential for telework programs to include well-defined, formal guidelines regarding eligibility for teleworking, specific and consistent procedures for teleworking implementation, and valid and equitable reasons for denying the ability to telework. More importantly, to achieve the policy goals of effective teleworking, the authors asserted that a well-designed teleworking program and policy should be fairly and consistently applied to all employees and should not be excessively influenced by a manager's discretion. Therefore, to support higher levels of teleworking satisfaction, contribute to assisting with federal employees' dependent care responsibilities, and finally to help employees achieve a work-life balance, federal agencies should equitably increase their approvals to permit employees to telework as well as address the technical obstacles that constrain employees from participating in teleworking arrangements.

Limitations of the Study

This study seeks to contribute to the teleworking and family-friendly policy literature in the public sector with the theoretical, methodological, and managerial implications mentioned above. However, it also has several limitations that must be noted and that future research should address.

First, the 2011 FEVS that this study utilized does not include items that measure additional significant factors that might influence a teleworker's satisfaction with teleworking. As a result, this study may have omitted variable bias, which may have influenced both the explanatory variables and the dependent variable of teleworking satisfaction. Specifically, according to the selected literature of this study, the following variables may be significant omitted factors in this research: a teleworker's marital status, number of dependent children, elders, and/or disabled individuals living in the home, income level, spouse' income and employment status, (Scandura & Lankau, 1997; Saltzstein et al., 2001; Kossek et al., 2006; Lee & Hong, 2011), teleworking experience or career level (Maruyama et al., 2009; Guthrie & Pick, 1998), and average commuting distance (Helminen & Ristimaki, 2007; Mokhtarian, Collantes & Gertz, 2003).

Second, the study's statistical findings and hypotheses tests did not represent the exact extent to which a teleworker's family responsibility, satisfaction with child and elder care program, and volume (frequency) of teleworking have impacts on her or his level of satisfaction with teleworking over time because the research design was cross-sectional. Thus, to show the causal relationships between the independent and dependent variables included in this research, future teleworking research must utilize panel data.

Third, this study utilized a large sample and was conducted at an individual level rather than at an agency or organizational level in the United States federal government to provide a better understanding of the factors that influence teleworkers' satisfaction with teleworking, and employees' demographic characteristics and organizational factors were controlled based on discussions from the prior literature (e.g., Lee & Hong, 2011; Saltzstein et al., 2001; Scandura & Lankau, 1997, etc.). However, as previously indicated in the methodology section, large-N data analysis may lead to statistically significant relationships between independent and dependent variables even though the relationships may not exist. Therefore, some of statistically significant associations that were found in this study may be insignificant in a smaller sample analysis.

Fourth, this study constructed the dependent, independent and control variables that were included in the analysis using a single data source, i.e., the 2011 FEVS. Thus, this study has limitations that are associated with monosource bias because it utilized only federal teleworkers' self-reported and perceptional measures. In particular, an employee who has a high level of overall satisfaction with her or his organization may also be likely to report high and positive scores for all of the survey items. As a result, the use of a monosource, as in this study, may lead to biased relationships between the dependent and independent variables. Although this study utilized the procedure of clustering standard errors by agency in the analysis to address the expected correlated error term of individual employees who work in the same agency, it should be noted that the study is not free from monosource bias.

Fifth, as for the operationalization of federal teleworkers' family care responsibilities, I used respondents' participation in the child and elder care program as a

proxy for having family care responsibilities. However, it should be noted that this operationalization does not directly measure federal teleworkers' child and elder care responsibilities as some employees might have dependent care obligations but might not participate in their agencies' child or elder care programs for various reasons. The inclusion of a direct measurement of federal teleworkers' family care responsibilities would strengthen this research; however, data were not available in the 2011 FEVS. That is, the overall premise of this study was that employees with family care obligations currently participate in their agencies' child and elder care programs.

Suggestions for Future Research

Despite these limitations, the study findings and implications provide some influential suggestions for future research that can contribute to the body of teleworking and family-friendly policy scholarship in the following ways.

First, it is recommended that future research examine the association between a teleworker's teleworking satisfaction and other work-related outcomes, such as work motivation (Caillier, 2012), performance (e.g., Lee & Hong, 2011; Saltzstein et al., 2001; Kossek et al., 2005), intention to stay (e.g., Caillier, 2013; Lee & Hong, 2011; Kossek et al., 2005), organizational commitment or job involvement (e.g., Scandura & Lankau, 1997; Crooker & Grover, 1993; Caillier, 2013), and work-family or work-life balance (e.g., Maruyama et al., 2009; Julien et al., 2011; Saltzstein et al., 2001). Furthermore, to develop the extant teleworking literature, it would be meaningful to investigate the interaction effects of a teleworker's demographics on the associations between her or his teleworking satisfaction and the outcomes suggested above.

Second, to address one of the current study's limitations (i.e., omitted variable bias), future research should include several crucial variables that might influence a teleworker's level of satisfaction with teleworking, such as teleworkers' family characteristics (e.g., marital status, number of dependent children, elders, and/or disabled individuals living in the home, income level, and spouse's income and employment status), level of teleworking experience, average commuting distance, level of satisfaction with technology or technical support for teleworking, and level of satisfaction with implementation procedure of teleworking program in organizations. In this way, such research will be able to provide a richer understanding of the factors that significantly influence teleworkers' teleworking satisfaction in public organizations.

Third, combining multiple measures with an employee's perceptual response is necessary in future research to strengthen the statistical findings and implications drawn in the current research analyses. In particular, it is recommended to contrive and utilize different indicators for some of the organizational control variables included in this study (e.g., supervisory support for work and life issues, resource provision, performance appraisal, and job knowledge share) and some of the outcomes suggested for future research (e.g., performance, organizational commitment and work-life balance). This strategy would address the present study's limitations associated with monosource bias due to the use of solely federal employees' self-reported and perceptional measures.

Fourth, a qualitative approach (e.g., in-depth interview and case study) could be added to future research to explore and verify in-depth why federal teleworkers perceive their teleworking satisfaction differently. In addition, qualitative research would strengthen the empirical findings of the current study and discover underlying

implications hidden by the statistical evidence. Furthermore, it would provide more immediate and practical implications that might be beneficial to public managers to address the managerial difficulties associated with the implementation of teleworking in the public sectors.

Fifth, although this study primarily focused on teleworking programs in the public sector, future research must extend its scope to other types of alternative work schedules such as compressed workweek and flexible work schedules, as addressed in the past literature (e.g., Julien et al., 2011; Lee & Hong, 2011; Saltzstein et al., 2001). Such studies will be able to explore what factors influence an employee's satisfaction with different types of alternative work programs and schedules and contribute to the body of family-friendly policy scholarship.

Sixth, regarding the expected negative influence of an excessive reliance on telework in the extant teleworking literature, future research will need to investigate the idea of relatively different feelings of isolation and invisible interactions and disconnectedness with colleagues and organizations that teleworkers may experience, depending on their job responsibilities, work environmental characteristics, and organizational culture.

Seventh, using a time-series cross-sectional analysis, future research should explore the causal inference regarding whether teleworkers' dependent care obligations, satisfaction levels with their dependent care programs, and volume of teleworking impact their satisfaction with teleworking over time. Furthermore, such research should assess whether the empirical findings of the current research represent causal relationships by focusing on particular federal agencies or grouped employees over time.

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Appendix A

List of Agencies Participated in the 2011Federal Employee Viewpoint Survey

Departments and Large Agencies
Broadcasting Board of Governors
Court Services and Offender Supervision Agency
Department of Agriculture
Department of Commerce
Department of Education
Department of Energy
Department of Health and Human Services
Department of Homeland Security
Department of Housing and Urban Development
Department of Justice
Department of Labor
Department of State
Department of the Interior
Department of the Treasury
Department of Transportation
Department of Veterans Affairs
Environmental Protection Agency
Equal Employment Opportunity Commission
Federal Communications Commission
Federal Energy Regulatory Commission
Federal Trade Commission
General Services Administration
National Aeronautics and Space Administration
National Archives and Records Administration
National Credit Union Administration
National Labor Relations Board
National Science Foundation
Nuclear Regulatory Commission
Office of Management and Budget
Office of Personnel Management
Pension Benefit Guaranty Corporation
Railroad Retirement Board
Securities and Exchange Commission
Small Business Administration
Social Security Administration
U.S. Agency for International Development
Department of Defense
Department of the Air Force
Department of the Army
Department of the Navy
U.S. Army Corps of Engineers
U.S. Marine Corps

OSD, Joint Staff, Defense Agencies, & DoD Field Activities
Small/Independent Agencies
Advisory Council on Historic Preservation
African Development Foundation
American Battle Monuments Commission
Chemical Safety and Hazard Investigation Board
Commission on Civil Rights
Committee for Purchase from People Who Are Blind or Severely Disabled
Commodity Futures Trading Commission
Consumer Product Safety Commission
Corporation for National and Community Service
Defense Nuclear Facilities Safety Board
Export-Import Bank
Federal Election Commission
Federal Housing Finance Agency
Federal Labor Relations Authority
Federal Maritime Commission
Federal Mediation and Conciliation Service
Federal Retirement Thrift Investment Board
Institute of Museum and Library Services
Inter-American Foundation
International Boundary and Water Commission: U.S. & Mexico
Marine Mammal Commission
Merit Systems Protection Board
National Capital Planning Commission
National Council on Disability
National Endowment for the Arts
National Endowment for the Humanities
National Gallery of Art
National Indian Gaming Commission
National Mediation Board
National Transportation Safety Board
Nuclear Waste Technical Review Board
Occupational Safety and Health Review Commission
Office of Navajo and Hopi Indian Relocation
Office of the U.S. Trade Representative
Postal Regulatory Commission
Selective Service System
Surface Transportation Board
Trade and Development Agency
U.S. Access Board
U.S. International Trade Commission
Woodrow Wilson International Center for Scholars

Source: The 2011 Federal Human Capital Survey Final Report, http://www.fedview.opm.gov/2011/Published/