

Facilitating Telecommuting: Exploring the Role of Telecommuting Intensity and Differences Between Telecommuters and Non-Telecommuters



MTI Report 09-14



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**FACILITATING TELECOMMUTING: EXPLORING
THE ROLE OF TELECOMMUTING INTENSITY AND
DIFFERENCES BETWEEN TELECOMMUTERS AND
NON-TELECOMMUTERS**

June 2010

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a publication of the
Mineta Transportation Institute
College of Business
San José State University
San José, CA 95192-0219
Created by Congress in 1991

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. CA-MTI-10-2803	2. Government Accession No.		3. Recipients Catalog No.	
4. Title and Subtitle Facilitating Telecommuting: Exploring the Role of Telecommuting Intensity and Differences Between Telecommuters and Non-Telecommuters			5. Report Date June 2010	
			6. Performing Organization Code	
7. Authors Nancy Da Silva, PhD Meghna Virick, PhD			8. Performing Organization Report No. MTI Report 09-14	
9. Performing Organization Name and Address Mineta Transportation Institute College of Business San José State University San Jose, CA 95192-0219			10. Work Unit No.	
			11. Contract or Grant No. DTRT07-G-0054	
12. Sponsoring Agency Name and Address California Department of Transportation Sacramento, CA 94273-0001 U.S. Department of Transportation Office of Research—MS42 Research & Special Programs Administration P.O. Box 942873 400 7th Street, SW Washington DC 20590-0001			13. Type of Report and Period Covered Final Report	
			14. Sponsoring Agency Code	
15. Supplementary Notes				
16. Abstract Walls, Safirova and Jiang (2007) note the paucity of studies that examine telecommuting among individuals across organizations and studies that compare telecommuters with non-telecommuters. This study responds to this call by gaining a deeper understanding of telecommuting patterns and adoption behavior through an examination of perceived obstacles and facilitators of telecommuting. The study involved data collection using survey methodology, focus groups, and archival data collection. Respondents include telecommuters and non-telecommuters as well as supervisors from a wide variety of organizations. The study also included collecting benchmarking data regarding telecommuting policies and practices of companies in Silicon Valley in an attempt to understand factors that impact telecommuting.				
17. Key Words Human resources management; Telecommuting; Traffic congestion		18. Distribution Statement No restrictions. This document is available to the public through The National Technical Information Service, Springfield, VA 22161		
19. Security Classif. (of this report) Unclassified	20. Security Classifi. (of this page) Unclassified	21. No. of Pages 48	22. Price \$15.00	

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Library of Congress Catalog Card Number 2010922580

To order this publication, please contact the following:

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ACKNOWLEDGMENTS

The authors would like to acknowledge the contributions of several of their friends and colleagues who have helped with data collection and useful feedback at various stages of the study. We would like to thank Joe Giglierano for his suggestions on our research methodology, and Marlene Turner, Deanna Fairchild for help and support with data collection and reaching out to HR managers in the community. We would like to thank the three anonymous reviewers for improving the quality of our report. We would like to thank the Silicon Valley Leadership Group for help with our focus groups. Many thanks to M.J. Carvalho, Julie Tu, Yazmin Perez, Cheryl Roy, Jen Brown, and many other students from San José State University who helped us with various tasks associated with the research including data collection. Thanks are also due to Rossella Derickson and Krista Henley of the South Bay Organizational Development Network for helping announce the study to their members. We would also like to thank all the survey and focus group participants for providing us with their thoughts and opinions regarding telecommuting. We could not have completed this project without them.

We would like to thank the leadership and staff at the Mineta Transportation Institute for their support of all phases of this work, including former-MTI Research Director Trixie Johnson, the current Research Director, Karen Philbrick, PhD, Communication Director Donna Maurillo, Research Support Manager Meg A. Fitts, Webmaster Frances Cherman, Student Publication Assistant Sahil Rahimi, Student Research Support Assistant Joey Mercado and Student Graphic Artists JP Flores and Vince Alindogan. Editing and publication assistance was provided by Editorial Associates Hilary Decent and Catherine Frazier.

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EXECUTIVE SUMMARY

Telecommuting, which entails working away from the conventional workplace has not experienced the growth projections predicted (Mokhtarian, 1998; Pliskin, 1997). Also, academic research on telecommuting in the management and psychology fields is relatively undeveloped, despite a lot of popular press about the benefits and disadvantages of working from home.

In this study the authors sought to get a better understanding of the factors that help and hinder telecommuting adoption by employees by delving into attitudes and behaviors of both employees who telecommute and those who do not telecommute as well as by examining supervisor attitudes, and HR practices in organizations related to telecommuting. For telecommuters, they sought to gain a better understanding of how “extent of telecommuting,” i.e. the number of days a week a telecommuter works away from the office has an effect on employee satisfaction.

The sample for this project consisted of individuals working in a variety of organizations in Silicon Valley. For each organization, the authors sought to get survey responses from a telecommuter, a non-telecommuter and their supervisor, with all three working in the same department. The data was collected in 2008. The authors received 624 surveys. Of these 262 were telecommuters, 181 non-telecommuters and 181 supervisors.

The study’s research questions attempted to gain a better understanding of the barriers and facilitators of telecommuting. The first set of research questions centered around understanding the differences between telecommuters and non-telecommuters on job attitudes. The authors found that telecommuters were more committed to the organization (organizational commitment) and were more satisfied with life in general (life satisfaction) than non-telecommuters. However, they did not find any differences between telecommuters and non-telecommuters on how satisfied they were in their jobs (job satisfaction) and whether they were more likely to leave the organization in which they were employed (turnover intentions).

Furthermore, the authors wanted to understand what was the optimal amount of telecommuting. So for the subsample of telecommuters, the authors examined the relationship between extent of telecommuting and job attitudes. They found telecommuters to be more satisfied with their jobs when they engaged in moderate levels of telecommuting as opposed to extreme levels of telecommuting (i.e. very high or very low). Telecommuters were also less likely to leave the organization when extent of telecommuting was moderate.

The authors also examined whether there are personality differences between telecommuters and non-telecommuters. They found that telecommuters were more likely to be extraverts—i.e. someone who is sociable and talkative (Barrick and Mount 1991)—than non-telecommuters.

Research findings also indicated that telecommuters were more likely to experience

disruption in their work due to greater family responsibilities. In other words their family responsibilities tended to interfere with their work (family interference in work) more than for non-telecommuters.

Not surprisingly, research revealed that telecommuters, on average, commuted for longer distances and for longer time periods than their matched non-telecommuting coworkers. However, telecommuters were less likely to drive to work during rush hour. Furthermore, there was a slightly higher number of telecommuters who reported their commute to be stressful compared to non-telecommuters. One interesting finding was that more than 50 percent of telecommuting supervisors believed that employees have to be a high performer to telecommute. Among non-telecommuting supervisors, 37 percent agreed with that statement.

The authors also examined whether employees and supervisors would have different perceptions of HR practices depending on whether they telecommute or not. Their finding was that telecommuters have different beliefs and perceptions regarding their organization's support for telecommuting. This was evident in that more telecommuters than non-telecommuters felt that organizational reward structures supported telecommuting, and that adequate training in technology was available for the telecommuter. Telecommuters also experienced greater support from their supervisors and also felt that the performance evaluation system supported those who work offsite.

This study, which was done among telecommuters across multiple organizations strongly suggests that moderate amounts of telecommuting may be the best strategy for companies that are seeking to introduce large scale telecommuting. This seems to provide the best outcomes for employees in terms of commitment and life satisfaction. But the study finds that personality is an important variable, which should be considered as important for future research. Also in the study, researchers did not examine specific job characteristics, so future research should examine job characteristics that make certain jobs lend themselves to telecommuting. This would be an extremely worthwhile endeavor because it would help organizations design telecommuting programs that are tailored to certain jobs.

INTRODUCTION

While there is no universal definition for telecommuting (Mokhtarian, Salomon and Choo 2005; Tremblay 2002), a recent meta-analysis (a summary of previous studies on telecommuting) by Gajendran and Harrison (2007) in the psychology and management literatures defined telecommuting as an alternative work arrangement in which employees perform some portion of their job outside their primary workplace. Oftentimes, this secondary location is an employee's home. Although exact number of telecommuters has been difficult to quantify due to non-standardized definitions of telecommuting, research estimates that the number of teleworkers (a term, often used interchangeably with the word telecommuter) increased more than tenfold in a decade (Shellenbarger 1997) to roughly 22 percent of the American workforce in 2001 (Gibson, Blackwell, Dominicus and Demerath 2002). Another study (U.S. Census Bureau 2004) reported that nearly 4.2 million people worked at home in 2000, up from 3.4 million in 1990. The Dieringer Research group indicated that 12.4 million Americans worked for employers that allowed them to work from home at least one day per month, up from 9.9 million in 2005, representing a 25 percent increase. Others using different definitions of telecommuting, have reported figures of more than 28 million telecommuters in the United States, indicating an increased adoption of telecommuting as an alternative work arrangement (Golden, Veiga and Simsek, 2006).

Rising estimates of telecommuters is not surprising given the benefits of telecommuting to multiple stakeholders. Society benefits when employees telecommute because working from home reduces gasoline consumption and auto emissions (Shafizadeh, Niemeier, Mokhtarian and Salomon 1997). Organizations that support telecommuting programs benefit due to lower office overhead costs and lower employee turnover rates (Bailey and Kurland 2002). Finally, employees who telecommute benefit from having greater levels of satisfaction with their work and improved quality of life (Golden and Veiga 2005; Van Sells and Jacobs 1994).

However, telecommuting is not growing as fast as predicted by researchers and practitioners. Numerous employees and managers are still resistant to telecommuting. For example, one could argue that the technological environment of Silicon Valley combined with the high traffic congestion in the Bay Area would make organizations more receptive to alternative work arrangements such as telecommuting. However, many organizations have been reluctant to embrace telecommuting and in fact provide incentives (for example, on site gyms and day care centers) that encourage employees to go to work.

This study seeks to understand the perceived obstacles and facilitators of telecommuting from the stakeholder perspective by evaluating both employee and management's attitudes toward telecommuting. The intention is to understand factors that make certain telecommuting arrangements more successful than others, and how this relates to traffic congestion. The sample for this project was comprised of organizations in Silicon Valley, however, the authors expect the findings to apply to other urban areas such as Boston and Chicago. Although these cities may have more public transit systems available, they are also technology centers that are similar in size, are high cost of living cities, and may have telecommuting issues comparable to Silicon Valley.

The specific aims for this study were to determine perceived facilitators and obstacles to telecommuting by examining individual level determinants that have an impact on telecommuting. As such the study's research questions focused on examining differences between telecommuters and non-telecommuters on attitudes such as job and life satisfaction, and to see if extent of telecommuting plays an important role in determining effectiveness of telecommuting implementation. Some of these outcomes included job and life satisfaction, organizational commitment, and turnover intentions. These were specifically chosen as outcome variables in testing relationships since these are commonly desired outcomes sought by organizations (Harrison, Newman and Roth 2006). A secondary purpose of this study was to see if people with certain personality characteristics are more suited to telecommuting, and to examine how home life may interfere with work life when telecommuting.

Research Questions

The following are the specific research hypotheses that are addressed in this report.

Research Question 1: A curvilinear (inverted-U shape) relation exists between the extent of telecommuting and employee job attitudes (job satisfaction, life satisfaction, organizational commitment, turnover intention). More specifically, job satisfaction, life satisfaction, and organizational commitment will be highest when extent of telecommuting is moderate. Telecommuters will be less likely to leave (resign from) the organization when extent of telecommuting is moderate.

Research Question 2: There will be differences in job attitudes between employees who telecommute and employees who do not telecommute

Research Question 3: Telecommuters will have different personality characteristics than non-telecommuters. In particular the researchers examine differences on two personality characteristics: conscientiousness (someone who is responsible, dependable, and organized) and extraversion (someone who is sociable and assertive).

Research Question 4: Since telecommuting involves working from home, it is important to examine whether telecommuters and non-telecommuters differ on their work-family interactions. The authors examine whether work responsibilities interfere with family responsibilities (hereinafter referred to as work-interfering-with-family or WIF) and whether family responsibilities interfere with work (hereinafter referred to as family-interfering-with-work or FIW) will be different for telecommuter and non-telecommuters.

Research Question 5: There will be differences in objective mobility indicators (commuting time and commuting distance) and commuting perceptions, between employees who telecommute and employees who do not telecommute.

Research Question 6: The study examines the circumstances is telecommuting prohibited to understand the barriers to telecommuting.

Research Question 7: Supervisors who telecommute will differ in their attitudes toward

telecommuting than those who do not telecommute.

Research Question 8: Employees and supervisors will have different perceptions of HR practices depending on whether they telecommute or not.

Research Question 9: The researchers obtain the HR professionals' perspective on telecommuting issues through a focus group discussion that discusses barriers and facilitators of telecommuting.

Thus, research question 1 is based on analysis of data obtained from telecommuters only, since the independent variable of interest for this research question is "extent of telecommuting." Research questions 2 through 5 specifically focus on differences between telecommuters and non-telecommuters. As such, the data used for analyzing these research questions is obtained from a comparison of telecommuters and non-telecommuters. Research questions 6 and 7 are tested with data obtained from the supervisor survey; although research question 6 examines conditions under which telecommuting is prohibited, Question 7 focuses on differences between supervisors who telecommute with supervisors who do not telecommute. Research questions 8 and 9 deal with HR practices related to telecommuting, but are different in that research question 8 examines perceptions of HR practices between employees and supervisors who telecommute and those who do not, and research question 9 taps into issues that human resource (HR) managers face in implementing telecommuting programs. Although the data for research questions 1 through 8 were obtained from surveys, the data for research question 9 is obtained from focus group discussions among managers in high-technology companies.

RESEARCH QUESTIONS

Is Extent of Telecommuting Related to Job and Life Satisfaction, Organizational Commitment and Turnover Intentions?

The popular press mentions increases in job satisfaction as one of the important outcomes resulting from telecommuting (Golden and Veiga 2005). Gajendran and Harrison (2007) in a meta-analytic study in which they summarized the results of 46 studies found a positive relationship between telecommuting and job satisfaction. The argument that telecommuting has a positive impact on job satisfaction is derived from the logic that telecommuting allows an employee greater flexibility and autonomy in how his/her work is accomplished. This allows individuals to meet their job demands as well as their personal and family demands.

Conversely, other theoretical perspectives contend that telecommuting results in decreased social interactions and relations with co-workers and when coupled with feelings of social isolation, telecommuters may experience lower levels of job satisfaction than their non-telecommuting counterparts (Cooper and Kurland 2002; Harpaz, 2002).

In a study that aimed at reconciling these inconsistencies, Golden and Veiga (2005) demonstrated that the relationship between extent of telecommuting and job satisfaction is a curvilinear, inverted U-shaped relation. In particular, they noted telecommuters experience an increase in job satisfaction at relatively low levels of telecommuting, which tapers off and begins to decrease at more extensive levels of telecommuting. The argument is that at relatively low levels of telecommuting, individuals are able to get the benefit of having social interaction with their colleagues and supervisor at work and the flexibility to meet personal needs (Golden and Veiga, 2005). On the other hand, at very high levels of telecommuting, the loss of social interaction resulting in social and professional isolation lead to decreased job satisfaction. This may occur due to fewer opportunities for participating in developmental activities such as mentoring, interpersonal networking and informal learning (Cooper and Kurland 2002). This curvilinear relationship has been replicated in subsequent studies with job satisfaction (Golden 2006; Virick, Da Silva and Arrington 2010).

While most of the research has investigated the relationship between extent of telecommuting and job satisfaction, more recently, Virick, Da Silva and Arrington (2010) found that telecommuters are most satisfied with their life when they telecommute at moderate levels. Furthermore, Gajendran and Harrison (2007) found that telecommuters are less likely to resign from the organization in which they work than non-telecommuters. This is important because giving employees the option to telecommute may actually help in retaining good employees.

The present study seeks to validate and extend the relation identified by Golden and Veiga (2005) by testing the relation between extent of telecommuting and job and life satisfaction. It also extends the curvilinear hypotheses to two new outcome variables that have not been tested in the literature: organizational commitment and turnover intentions. These questions are important because they help us identify if extent of telecommuting is critical

to the success of telecommuting programs. Organizations who have had unsuccessful telecommuting programs should look at implementing moderate levels of telecommuting to facilitate effective telecommuting. Thus, the following prediction is made:

Research Question 1: A curvilinear relation exists between the extent of telecommuting and employee job attitudes (job satisfaction, life satisfaction, organizational commitment, turnover intentions). More specifically, job satisfaction, life satisfaction, and organizational commitment will be highest when the extent of telecommuting is moderate. Turnover intentions will be lowest when extent of telecommuting is moderate.

Are There Differences in Job Satisfaction, Life Satisfaction, Organizational Commitment and Turnover Intentions Among Telecommuters and Non-Telecommuters?

Although research on telecommuting tends to focus on extent of telecommuting, a few studies have looked at differences between telecommuters and non-telecommuters. For instance, Igarria and Guimaraes (1999) found that telecommuters tended to be happier with their supervisors and also tended to have higher organizational commitment (i.e. they were much more loyal to the organization in which they worked) than non-telecommuters. On the other hand, Staples (2001) found no differences between remote and non-remote workers (he defined a remote worker as one who was in a geographically different location than his/her manager), on stress levels and on perceptions of organizational climate.

Gajendran and Harrison (2007) found that telecommuters had higher job satisfaction and lower turnover intentions. They and others argue that flexible work arrangements are viewed positively by employees because it provides them autonomy and generates positive feelings toward the employer. The same argument can be used to hypothesize that telecommuting will be associated with higher levels of organizational commitment. The authors also propose that the autonomy and flexibility provided by telecommuting will be positively associated with higher levels of life satisfaction.

Research Question 2: There will be differences in job attitudes between employees who telecommute and employees who do not telecommute. In particular telecommuters will have higher levels of job satisfaction, life satisfaction, and organizational commitment, and lower turnover intentions.

Personality Differences Among Telecommuters and Non-Telecommuters

Few studies have examined personality differences among telecommuters and non telecommuters. Lamond (2000) speculated that personality would be an important consideration, suggesting that telecommuting dimensions (e.g. how much intra-organizational communication is important in the job) would have a bearing on whether a person with a certain personality characteristic would be effective. Feldman and Gainey (1997) propose a theoretical framework in which they argue that personality characteristics can affect whether certain individuals would gravitate or be attracted toward telecommuting work arrangements. In particular they noted that extraverts and those high on agreeableness may get frustrated in telecommuting arrangements.

In an unpublished study, Clark (2007) empirically tested whether the “Big 5” personality dimensions (conscientiousness, extraversion, emotional stability, agreeableness and openness to change) would predict attitudes toward telecommuting in a student sample. She found emotional stability to have a significant negative relation with attitudes toward telecommuting, whereas agreeableness and conscientiousness had a positive relation with attitudes to telecommuting, implying that those who are conscientious and agreeable would have positive attitudes toward telecommuting. The authors investigate the relationship between conscientiousness and extraversion among telecommuters and non-telecommuters (Conlin 2009; Lamond, 2000).

Conscientiousness, described as being organized, disciplined and responsible has been found to be the strongest predictor of job performance (Barrick and Mount 1991). Since telecommuting requires significant self management skills (Haines, St-Onge and Archambault 2002; Lamond 2000), researchers predict that telecommuters will be higher on conscientiousness than non-telecommuters.

An extravert, on the other hand, is described as someone who is sociable and talkative (Barrick and Mount 1991). Thus it is likely that individuals who are high in extraversion will be more likely to work in situations that have greater interaction with people. This suggests that telecommuters will be lower on extraversion than non-telecommuters.

Research Question 3: Telecommuters will have different personality characteristics than non-telecommuters. In particular telecommuters will be higher on conscientiousness and lower on extraversion than non-telecommuters.

Differences in Work Interfering With Family Among Telecommuters and Non-Telecommuters

There is a growing literature on the work-family interface. Researchers who study work-family issues examine conflict arising from work interfering with family (WIF) and family interfering with work (FIW). These researchers have had an interest in studying flexible work arrangements because flexibility provides a better overall quality of life for employees. Research in this domain is based on the assumption that where there is less conflict between work and family, it will lead to better outcomes of satisfaction and effectiveness among employees. In that context, telecommuting, as a flexible work arrangement is seen as a benefit that provides increasing flexibility in how work is done. Working from home allows employees to better manage their family responsibilities. At the same time, working from home enhances boundary permeability or enmeshing of work and family roles. Thus there is a greater chance of family related responsibilities interfering with your work, given that much of telecommuting involves working from home.

Whereas boundary permeability leads to greater intrusion of work into family and vice versa, thereby potentially increasing work family conflict, boundary flexibility also provides the flexibility in managing the two domains and thereby could help alleviate work family conflict. These two simultaneously occurring phenomenon are what have probably led to conflicting findings on the relationship between telecommuting and work family conflict. Gajendran and Harrison (2007) found telecommuters to have conflict. But in a

more finegrained analysis in which work interference in family (WIF) was differentiated from family interference in work (FIW), Golden et al. (2006) found that while WIF was lower for telecommuters, FIW was actually higher. A more recent study by Lautsch et al (2009) found telecommuting to be associated with lower WIF, but there was no relation between telecommuting and FIW. Thus, results are equivocal with respect to the effects of telecommuting on conflict.

Consistent with most of the previous literature the authors hypothesize telecommuting to be associated with lower work interference in family and lower family interference in work.

Research Question 4: Telecommuters will have lower work interference in family (WIF) and family interference in work (FIW) than non-telecommuters.

Objective Mobility and Commute Perceptions of Telecommuters and Non-Telecommuters

Transportation researchers and urban planners often look at commute distance and commute time as critical variables that affect transportation planning, travel demand and actual traffic patterns (Mokhtarian 1998). These are generally referred to as objective mobility (Collantes and Mokhtarian 2007).

Ory and Mokhtarian (2005) examined the travel patterns of California state employees over a 10-year period. They found that telecommuters had longer one-way commutes in terms of time and distance than employees who never telecommute. However, Ory and Mokhtarian also found that telecommuters commute less frequently and travel at higher speeds, in part due to telecommuters having the ability to travel during off-peak times and that telecommuters were more likely to live on the urban fringe in which parts of their commute were less congested compared to their non-telecommuting colleagues. Thus, the end result is such that telecommuters have fewer person-miles and person-minutes.

Based on Ory and Mokhtarian's (2005) findings, the authors predict that commute distance and time will be greater for telecommuters than non-telecommuters. As such, they hypothesize between group differences between telecommuters and non-telecommuters.

In regard to commuting preferences, the authors do not have specific hypotheses regarding the directionality of the differences in commuting perceptions between telecommuters and non-telecommuters, however, they do predict that there will be differences.

Research Question 5: There will be differences in objective mobility indicators (commuting time and commuting distance) and commuting perceptions, between employees who telecommute and employees who do not telecommute.

Under What Circumstances is Telecommuting Prohibited?

To understand the obstacles that prevent telecommuting from occurring, the authors propose an exploratory hypothesis that was aimed at generating open ended responses

from supervisors on the barriers or specific conditions under which telecommuting was prohibited. The rationale in doing so was to generate a list of possible explanations from a large number of supervisors on identifying the conditions under which telecommuting is prohibited. Supervisory opinions are important because most organizations provide supervisors with discretionary authority when it comes to allowing individual employees to telecommute, in effect serving as organizational gatekeepers of telecommuting (Mokhtarian and Salomon 1996). As such, the authors asked supervisors the following open-ended question.

Research Question 6: Under what circumstances is telecommuting prohibited?

Supervisors Who Telecommute Versus Those Who Do Not Telecommute: Attitudinal Differences

The authors argue that supervisors who telecommute will differ in their attitudes toward telecommuting than those who do not telecommute. They hypothesized that supervisors who do not telecommute will feel that evaluating the performance of telecommuters will be more challenging. They also predicted that supervisors who telecommute will be less likely to feel that telecommuters will suffer negative career consequences as a result of telecommuting.

To test the above, the authors asked questions relating to issues (1) evaluating the performance of telecommuters versus non telecommuters, (2) whether telecommuters will suffer with respect to career advancement relative to non-telecommuters, and (3), whether in their organization it was “important to be a high performer to telecommute.”

Research Question 7: Supervisors who telecommute will differ in their attitudes toward telecommuting than those who do not telecommute.

HR Practices: Difference in Perceptions Among Telecommuters and Non-Telecommuters

Although research on telecommuting tends to focus on the extent of telecommuting, a few studies have looked at differences between telecommuters and non-telecommuters. For instance, Igbaria and Guimaraes (1999) found that telecommuters tended to be happier with their supervisors and also tended to have higher organizational commitment than non-telecommuters. However, no studies to the authors’ knowledge have examined HR practices as they specifically relate to telecommuting.

Yet, the challenges of managing a geographically distributed workforce have been recognized. Scholars have emphasized the complexity and challenges that come about when a supervisor has a blended workforce and is simultaneously managing both telecommuters and non-telecommuters (Lautsch, Kossek and Eaton 2009). Lautsch and colleagues (2009) found that telecommuters and non-telecommuters perceive that they are being monitored differently. However, Lautsch and colleagues suggest that effective supervision would entail that telecommuters and non-telecommuters be managed no differently.

Extending that argument, the authors propose that telecommuters may perceive HR practices related to telecommuting to be different from that perceived by non-telecommuters. This may, in turn, impact employee attitudes and performance. Prior literature on HR practices has demonstrated that HR practices have an impact on organizational outcomes through their influence on employee attitudes (Huselid, 1995). Furthermore, researchers such as Nishii and Wright (2008) have also suggested that such employee perceptions of HR practices may well precede employee attitudes and behavior because employees may attach their own meaning to the HR practice, and thereby not interpret it in the same manner. To explore this, the authors propose exploratory hypotheses surrounding HR practices as they relate to telecommuting. In particular, this research will test whether telecommuters and non-telecommuters (among both employees and supervisors) differ in their perceptions regarding skills training for telecommuting, technology training for telecommuting, communication training, team work skills training, reward structure, pay-to-performance linkages, performance appraisals, supervisor support, and specified work hours.

Research Question 8: Employees and supervisors will have different perceptions of HR practices depending on whether they telecommute or not.

HR Practices: The HR Professionals' Perspective

There is some literature that examines why some firms are more likely to adopt telecommuting (Mayo, Pastor, Gomez-Mejia and Cruz 2009). However, to the authors' knowledge, no studies on telecommuting have examined HR practices by asking HR managers through an open-ended discussion on issues and challenges associated with telecommuting. As such, they sought to have an open ended exploratory discussion with HR managers from high tech companies in the Silicon Valley for a guided discussion on telecommuting issues in their organizations. They sought to get more information about HR practices and the realities of implementing telecommuting in organizations that was possible via survey methodology, as such focus group methodology was used to dig deeper into issues.

Research Question 9: The HR professionals' perspective on HR practices related to telecommuting.

SURVEYS

OBJECTIVE

The primary objective of the survey component of this project was to assess employee and supervisor attitudes and behaviors toward telecommuting.

SAMPLE

The researchers aimed at collecting the survey data in sets or triads. The triad consisted of a telecommuter, matched with someone in the same position who does not telecommute, and their respective supervisor. They received surveys from 262 telecommuters, 181 non-telecommuters and 181 supervisors. When they matched the department name and organization among the study's telecommuters and non-telecommuters, there were 125–134 paired dyads (the sample size differed due to missing data). Participants consisted of employees from over 200 companies working in over 200 different departments (for example, accounting, engineering, human resources, operations, information technology, global services). They had a variety of job titles (for example, account manager, engineering planner, financial analyst, IT architect, research analyst, software engineer, systems analyst).

Ninety-two percent of the companies were for-profit organizations and 43% were publicly traded companies. The publicly traded companies ranged from small (minimum size was 86 employees) to large (maximum size was 400,129 employees). The average publicly traded company in the study sample had 53,415 employees. Forty-one percent of the companies in the sample were technology related, not surprising given that the survey was conducted in Silicon Valley. The following table classifies companies by sector according to Standard Industrial Classification (SIC) codes as per the Department of Labor.

Table 1 Companies Surveyed by Industry Sector

Sector According to SIC Codes	Percentage
Agriculture, Forestry, and Fishing	0
Mining	0
Construction	1
Manufacturing	26
Transportation, Communications, Electric, Gas, and Sanitary Services	4
Wholesale Trade	2
Retail Trade	10
Finance, Insurance, and Real Estate	9
Services	40
Public Administration	0
Unclassified	8

The following is a summary of participant study demographics.

Table 2 Participant Demographics from Online Survey

	Employee Telecommuters	Employee Non-Telecommuters	Supervisors
	N = 262	N = 181	N = 181
Male	52%	43%	57%
Married	52%	49%	71%
Mean Position Tenure (yrs)	4.47	5.03	6.78
Mean Organizational Tenure (yrs)	4.94	5.13	7.65
Total Work Experience (yrs)	14.58	14.91	20.79

PROCEDURE

The researchers created three versions of the survey: (1) a survey for employees who telecommute, (2) a survey for employees who work in the same department as the telecommuter but do not telecommute, and (3) a survey for their respective supervisor.

The authors had students from several undergraduate business courses in Fall 2008 assist them with recruiting participants for the study. Students were asked to identify someone they knew who was employed full-time, preferably at a for-profit organization and who telecommutes for part of his/her work week. Students then asked his/her participant to provide the name and email address of a coworker in the department who did not telecommute and the name and email address of their respective supervisor. To assist the students in recruiting participants, students delivered a letter to each of their three participants, informing them of the nature of the survey. A pen inscribed with San José State University was also delivered as an incentive to complete the survey and as a thank you. Since researchers could not give monetary incentives, the participants' names were placed in a raffle and three participants received iPod Nanos.

The students submitted the names, email addresses, and company names. Using this information, a database was created with all of this information linking the participant information to the students' information to keep track of which students the researchers received participant information from. Researchers then emailed the participants a link to the online survey for them to complete. Each respondent received a unique link to the survey so once they completed the survey they could not go back and submit a second survey. A reminder email was sent out three weeks later to those who had still not completed their surveys. Paper and pencil versions of the survey were made available to students who requested them, however very few participants requested the paper and pencil surveys. 2G USB drives were given as gifts to students whose three volunteers had successfully completed the survey.

Students who found an additional set of volunteers were eligible to enter their name in a raffle to win prizes. Raffle prizes included two Dell Laptop computers, three Apple iPod Nanos, and ten USB drives.

For students enrolled in classes taught by the principal investigators, the survey data collection was integrated in a small class project examining HR policies regarding flexible

work arrangements. If a student did not want to take part in this project, an alternative assignment was provided. Students from several other classes also assisted in the recruitment effort and received extra credit for their participation in addition to being eligible for the raffle prizes.

To ensure the surveys were not completed by the students, researchers asked the survey respondent to include his/her name, phone number, and email address. They were fortunate that many of the study's participants gave researchers their workplace email addresses so they knew that the surveys were going directly to them. However, the authors were less confident of the handful of paper and pencil surveys that were received. Consequently, one of the research assistants served as a quality control person and randomly contacted a sample of the participants who submitted paper and pencil surveys to make sure the participant was who he/she said he/she was. A few individuals contacted did not recall completing the survey so researchers chose not to include the paper and pencil surveys in the study's analyses.

In summary, the following steps were taken to maximize survey response rates: (1) providing incentives for both the participants and the students, (2) incorporating this recruitment procedure within a broader class project, (3) regularly updating the students to let them know whether their participants completed the survey so they could follow up directly with the participants, and (4) sending follow up email reminders to the participants.

EMPLOYEE MEASURES

Appendix A contains a list of the items for each measure. Unless indicated below, all measures used a 5 point likert-type scale that ranged from 1 = strongly disagree to 5 = strongly agree.

Telecommuting Status

In the survey telecommuting was defined as follows: "Telecommuting is an alternative work arrangement that typically involves working from home some portion of the work week and by using electronic devices to interact with others inside and outside the organization." Researchers then asked participants to indicate whether they currently telecommute. Participants who reported currently telecommuting were coded 1 and participants who did not currently telecommute were coded 0.

Job Satisfaction

Job satisfaction was measured with three items developed by Cammann, Fichman, Jenkins and Klesh (1983). The scale reliability, measured with Cronbach's alpha was $\alpha = .90$. The reliability of the scale measures the internal consistency of the measure, with reliabilities (alpha coefficients) above .70 being considered acceptable (Nunnally and Bernstein, 1994).

Life Satisfaction

Life satisfaction was measured with four items created by Diener, Emmons, Larsen, and Griffin (1985). Reliability of the scale was $\alpha = .80$.

Organizational Commitment

Organizational commitment was measured using the six items capturing affective organizational commitment suggested by Meyer and Allen (1997). The negatively worded items in the original measure were adapted to be formulated in the affirmative. Reliability of the scale was $\alpha = .89$

Turnover Intentions

This was measured with two items by Camman, Fichman, Jenkins and Klesh (1979). Reliability of the scale was $\alpha = .82$

Conscientiousness

Conscientiousness was measured with five items from Goldberg's international personality item pool (<http://ipip.ori.org>). Reliability was $\alpha = .74$.

Extraversion

Extraversion was measured with five items from Goldberg's international personality item pool (<http://ipip.ori.org>). Reliability of the scale was $\alpha = .84$.

Work Interference With Family

Work interference with family was measured with six items from Carlson, Kacmar and Williams (2000). Reliability was $\alpha = .89$

Family Interference With Work

This construct was measured with five items from Carlson, Kacmar and Williams (2000). Reliability was $\alpha = .81$.

Objective Mobility

Researchers gathered commuting information by asking participants (1) how many miles and (2) how many minutes was the round-trip commute from home to their workplace.

Commuting Perceptions

This construct was measured with three items developed by the authors.

Circumstances When Telecommuting is Prohibited

In the survey researchers included an open-ended question in which the researchers asked employees the following “Under what circumstances is telecommuting prohibited in your organization?”

Perceptions of HR Practices

This construct was measured by adapting ten items derived from those suggested by Huselid (1995), and Rogg, Schmidt, Shull and Schmitt (2001) to reflect HR practices in relation to telecommuting.

SUPERVISOR MEASURES

Telecommuting Status

In the survey telecommuting was defined as follows “Telecommuting is an alternative work arrangement that typically involves working from home some portion of the work week and by using electronic devices to interact with others inside and outside the organization.” Researchers then asked participants to indicate whether they currently telecommute. Participants who reported currently telecommuting were coded 1 and participants who did not currently telecommute were coded 0.

Perceptions of HR Practices

This construct was measured by adapting ten items derived from those suggested by Huselid (1995), and Rogg, Schmidt, Shull and Schmitt (2001) to reflect HR practices in relation to telecommuting.

Supervisor’s Attitudes Toward Telecommuting

The authors developed their own items to assess supervisor’s attitudes toward telecommuting.

RESULTS FOR RESEARCH QUESTION 1

Early research examined the linear relationship between amount of telecommuting and job satisfaction (Bailey and Kurland, 2002). That is, does amount of telecommuting increase or decrease an employee’s level of job satisfaction? Some researchers theorized that the more an employee telecommutes the more satisfied he/she will be because telecommuting provides greater work-life balance (Aziz and Zickar 2006). However, others theorized that the more an employee telecommutes the less satisfied he/she will be, because the employee will experience greater social isolation and professional support (Cooper and Kurland 2002).

Golden and Veiga (2005) took a completely different perspective and argued that the relationship between amount of telecommuting and job satisfaction is not linear but rather

is curvilinear, in the shape of an unverted U. Golden and Veiga found support for their hypothesis. Job satisfaction was highest when employees telecommuted a moderate amount, which they found to be approximately 15 hours a week (equivalent to about two work days).

The first research question was to test whether a curvilinear relation exists between the extent of telecommuting and employee job attitudes (job satisfaction, life satisfaction, organizational commitment, and turnover intentions). More specifically, job satisfaction, life satisfaction, and organizational commitment will be highest when extent of telecommuting is moderate. Turnover Intentions will be lowest when extent of telecommuting is moderate.

Researchers measured an employee's extent of telecommuting with two questions: "In a typical week how many hours do you spend working from home?" and "What proportion of an average work week do you spend telecommuting?" The results were identical so the authors report the results from the second question.

They then tested research question 1 by running a series of hierarchical regression analyses for the subsample of telecommuting employees. In the analyses, the authors controlled for organizational tenure, sex, and marital status. Curvilinearity was tested by entering the linear telecommuting term in the first step and by entering the squared telecommuting term in the second step.

In predicting job satisfaction, results support the notion of a curvilinear relationship ($R^2_{cha} = .03, p < .05$). Study findings are consistent with the recent findings by Golden and Veiga (2005) and Virick, DaSilva and Arrington (2010). As depicted in Figure 1 on the following page, the highest level of job satisfaction is reported when there is a moderate amount of telecommuting. This is important for HR practitioners and for those who create and administer telecommuting programs in companies because it tells us that moderate levels of telecommuting gives the best results in terms of job satisfaction levels.

Surprisingly, extent of telecommuting was not related to life satisfaction in this study. However, extent of telecommuting was significantly related to organizational commitment and turnover intentions (see Table 3 for results). Commitment to the organization was highest when there was a moderate amount of telecommuting (see Figure 2) and turnover intentions were lowest when there was a moderate amount of telecommuting (see Figure 3). Thus this study is the first to report findings of a curvilinear relation between the extent of telecommuting and both organizational commitment and turnover intentions. This is important because this study demonstrates that not only is moderate telecommuting good for job satisfaction of employees, but that those who telecommute at moderate levels are also more loyal and committed to the organization, and they are also less likely to leave the organization.

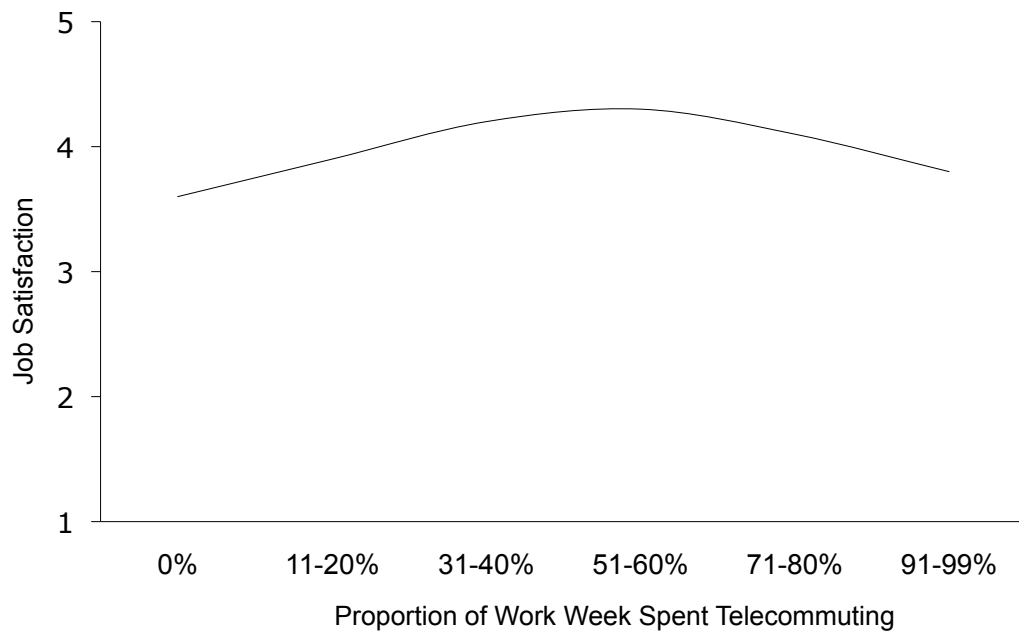


Figure 1 The Relationship Between Extent of Telecommuting and Job Satisfaction

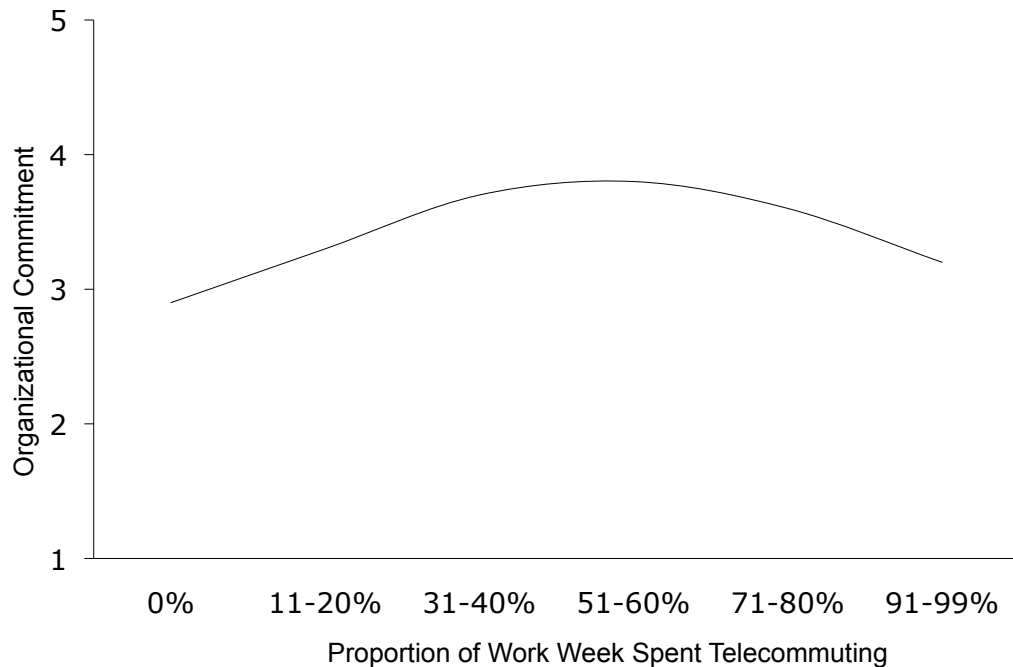


Figure 2 The Relationship Between Extent of Telecommuting and Organizational Commitment

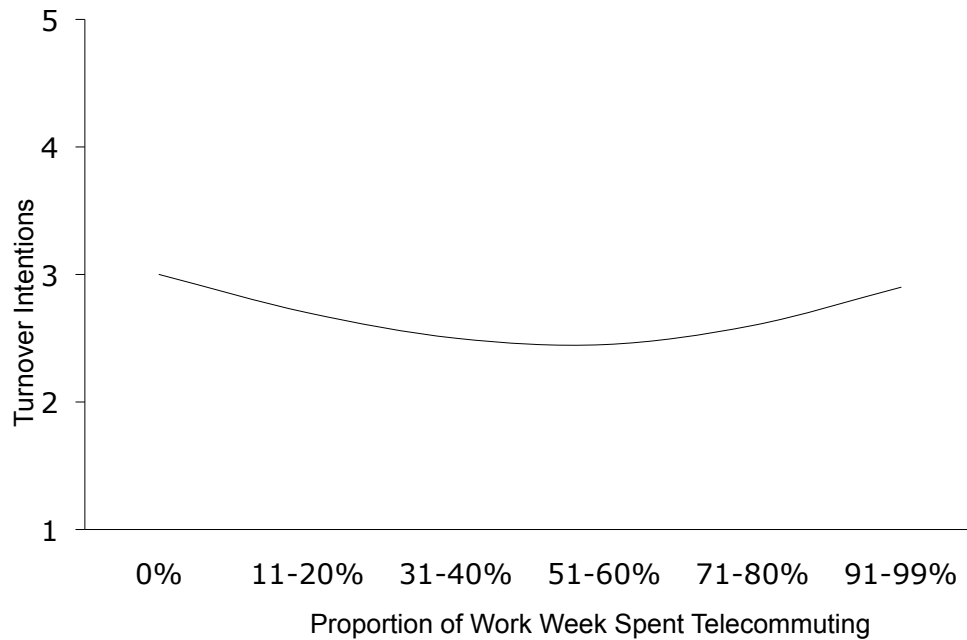


Figure 3 The Relationship Between Extent of Telecommuting and Turnover Intentions

Table 3 The Relationship Between Extent of Telecommuting (Proportion of Average Work Week Spent Telecommuting) and Employee Attitudes

Step		Job Satisfaction		Life Satisfaction		Org. Commitment		Turnover Intentions	
		β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
1	Organizational Tenure	-.05	.02	.05	.02	.08	.01	-.05	.00
	Sex	.00		.06		.02		-.03	
	Marital Status	-.12		.10		-.09		.02	
2	Telecommuting	.68*	.01	.14	.01	.56*	.00	-.62*	.00
3	Telecommuting ²	-.62*	.02*	-.05	.00	-.57*	.02*	.65*	.03**

* $p < .05$ and ** $p < .01$

Note: Step 1 tests the control variables, Step 2 tests the linear relationship between extent of telecommuting and the criterion variable and Step 3 tests the curvilinear relationship.

RESULTS FOR RESEARCH QUESTION 2

Research question 2 centered around a comparison of job attitudes (job satisfaction, life satisfaction, organizational commitment, and turnover intentions) between telecommuters and non telecommuters. Thus, researchers investigated that there will be differences in job attitudes between employees who telecommute and employees who do not telecommute. In particular, telecommuters will have higher levels of job satisfaction, life satisfaction, organizational commitment, and lower turnover intentions.

As seen in Table 4, results of the comparison of the matched telecommuters to non-telecommuters across the attitudinal measures indicated that telecommuters reported higher levels of life satisfaction and organizational commitment (p value at .10). However, no statistically significant differences were found between telecommuters and non-telecommuters on job satisfaction and turnover intentions.

Table 4 Results of a Matched Pairs t-test of Scale Means for Job Satisfaction, Life Satisfaction, Organizational Commitment, and Turnover Intentions

Construct	Mean Telecommuters	Mean Non-Telecommuters	T value	Results
Job Satisfaction	4.00	3.91	.95	No difference between telecommuters and non-telecommuters.
Life Satisfaction	3.47	3.31	1.63*	Telecommuters more satisfied with life then non-telecommuters.
Organizational Commitment	3.38	3.20	1.84+	Telecommuters report higher levels of organizational commitment.
Turnover Intentions	2.46	2.44	.17	No differences.
Life Satisfaction	3.47	3.31	1.63*	Telecommuters more satisfied with life then non-telecommuters.

* p < .05, + p < .10

RESULTS FOR RESEARCH QUESTION 3

Research question 3 tested whether telecommuters and non-telecommuters would differ in terms of their personality characteristics. In particular researchers examined whether they would differ with respect to conscientiousness and extraversion.

As shown in Table 5, no significant differences were found between telecommuters and non-telecommuters in conscientiousness. However, counter to the research hypothesis, it was found that telecommuters were higher on extraversion than non-telecommuters.

Table 5 Results of a Matched Pairs t-test of Scale Means for Conscientiousness and Extraversion

Construct	Mean Telecommuters	Mean Non-Telecommuters	T value	Results
Conscientiousness	3.73	3.77	-.57	No differences between telecommuters and non-telecommuters.
Extraversion	3.43	3.26	2.04*	Telecommuters are more extraverted.

* $p < .05$

RESULTS FOR RESEARCH QUESTION 4

Research question 4 examined differences in work interference with family and family interference with work between telecommuters and non-telecommuters. Based on past empirical studies, researchers had hypothesized that telecommuters will have lower work interference with family as well as lower family interference with work compared to their non-telecommuting counterparts.

Study findings (see Table 6) indicated that there was no difference between telecommuters and non-telecommuters on work interference with family. However, researchers did find that telecommuters reported higher family interference with work, which is counter to the hypothesis.

The findings that telecommuters report higher FIW is not surprising. This is because working from home makes telecommuters more accessible and available to family members, who may respond by increasing their expectations that the person who works from home is able to take on more family-related tasks. This disruption can be counterproductive for the telecommuter who may find themselves doing family chores that they would not otherwise have been able to do, if they were working in an office, and physically distanced from their home.

Table 6 Results of a Matched Pairs t-test of Scale Means for Work Interference with Family and Family Interference with Work Conflict

Construct	Mean Telecommuters	Mean Non-Telecommuters	t-test	Results
Work Interference with Family	2.98	2.84	1.33	No differences.
Family Interference with Work	2.29	2.11	2.37*	Telecommuters report higher family interference with work conflict

* $p < .05$

RESULTS FOR RESEARCH QUESTION 5

Research question 5 tested whether there would be differences in objective mobility indicators (commuting time and commuting distance) and commuting perceptions between employees who telecommute and employees who do not telecommute.

To test this, a subsample of the dataset was created by matching telecommuters and non-telecommuters who worked in the same company, same department, under the same supervisor.

Researchers asked the employees how many miles roundtrip they telecommuted and how many minutes roundtrip was the commute. There were 11 cases of telecommuters who had reported commuting over 300 miles and taking over 780 minutes roundtrip for their commute. Since several of these participants reported that their commutes were by plane, these 11 data points were dropped since it would not be an appropriate comparison.

As shown in the Table 7, the telecommuters, on average, commute for longer distances and for longer time periods than their matched coworker. However, telecommuters were less likely to drive to work during rush hour. Furthermore, there was a slightly higher number of telecommuters who reported their commute to be stressful compared to non-telecommuters (p value at .10), which may be a function of the longer distance and time required for their commute. There were no significant differences regarding the telecommuters and non-telecommuters perceptions of using public transportation.

Table 7 Comparison of Telecommuters and Non-Telecommuters Regarding Their Commuting Experience

	Mean Telecommuters	Mean Non-Telecommuters	T value
How many miles roundtrip is the commute from your home to work your workplace?	49 miles (SD = 53)	30 miles (SD = 31)	3.55**
How many minutes roundtrip is the commute from your home to your workplace?	74 minutes (SD = 84)	52 minutes (SD = 38)	2.61*
I regularly drive to and from work during rush hour.	2.96	3.56	-4.23**
If convenient public transportation was available, I would use it.	3.14	3.32	-1.29
My commute to work is stressful.	2.98	2.72	1.90+

Note: ** $p < .01$, * $p < .05$, + $p < .10$

RESULTS FOR RESEARCH QUESTION 6

Research question 6 dealt with conditions under which telecommuting is prohibited. Researchers asked all supervisors regardless of whether they telecommute an open-ended question that was stated as follows: ““Under what circumstances is telecommuting prohibited in your organization?”

Researchers coded the participants’ responses into categories and the following were the most common reasons that telecommuting is prohibited:

1. When face-to-face interactions are required (18% of respondents)
2. When performance is low (15%)
3. Hourly employees are not allowed to telecommute (13%)
4. The position doesn’t allow it (12%)
5. New employees are not allowed to telecommute (10%)
6. Telecommuting is generally discouraged (3%)

Ten percent of respondents stated that they did not understand what circumstances telecommuting was prohibited and 19% of respondents reported that there were no conditions in which telecommuting was prohibited.

RESULTS FOR RESEARCH QUESTION 7

Research question 7 addressed whether supervisors who telecommute have different attitudes toward telecommuting than supervisors who do not telecommute. Researchers hypothesized that supervisors who do not telecommute will feel that evaluating the performance of telecommuters will be more challenging. Researchers also predicted that supervisors who telecommute will be less likely to feel that telecommuters will suffer negative career consequences as a result of telecommuting.

In the study sample, most supervisors were managers/professional (56%), department heads (27%) or first level supervisors (14%). Most worked an average of 50 hours a week. Forty-five percent were salaried, 47% were salaried with an incentive (bonus), and 8% were hourly employees. About 50% of the supervisors were also currently telecommuting. Most supervisors (79%) said that their direct reports needed their approval before being allowed to telecommute.

To test the above research question, researchers asked questions relating to issues (1) evaluating the performance of telecommuters versus non-telecommuters, (2) whether telecommuters will suffer with respect to career advancement relative to non-telecommuters, and (3) whether in their organization it was “important to be a high performer to telecommute.”

Results indicated that 34% of telecommuting supervisors agreed with the statement that ‘it is more difficult to evaluate the performance of telecommuters and 37% of non-telecommuting supervisors agreed with that statement. However, about 25% of both telecommuting and non-telecommuting supervisors agreed with the statement that “telecommuters need less supervision than people who do not telecommute.”

Regarding career consequences, 12% of telecommuting supervisors agreed with the statement that telecommuters are more likely to get laid off (as compared to 14% among non-telecommuting supervisors). Also 10 % of telecommuting supervisors agreed with the statement that telecommuters are less likely to advance in their career (as compared to 13% agreement among non-telecommuters). Finally 52% of telecommuting supervisors agreed with the statement that “in my organization you have to be a high performer to telecommute.” Among non-telecommuting supervisors 37% agreed with that statement.

RESULTS FOR RESEARCH QUESTION 8

Research question 8 explored whether employees and supervisors will have different perceptions of HR practices depending on whether they telecommute or not. To test this question, researchers asked employees and supervisors the same ten questions regarding HR practices. To ease interpretation of the data, researchers collapsed the agree and strongly agree responses and report them below in Table 8.

The first HR practice had generally consistent results across all four categories. Approximately one-quarter of the participants in each category reported that their organization provided sufficient training in telecommuting work skills (HR practice 1 from Table 8). There was greater discrepancy in the second HR practice. Approximately half of the participants in each category reported sufficient training in technology to support those who telecommute with the lowest level of agreement among the non-telecommuting employees (46%) and the highest among the telecommuting supervisors (61%). Approximately half of the participants in all categories reported sufficient training in communication skills and teamwork skills (HR practice 3 and HR practice 4 respectively). Interestingly, 28% and 30% of the non-telecommuters (employees and supervisors) felt that the reward structure in their organization supported effective telecommuting whereas 43% of the telecommuting employees and 40% of the telecommuting supervisors agreed with this statement. This finding suggests that telecommuters and non-telecommuters have different perceptions regarding the reward structures support of telecommuting.

Over three-quarters of the respondents in all categories report that pay is linked to performance (HR practice 6 from Table 8) and there do not appear to be significant differences by telecommuting status. However, for the remaining HR practices, there does appear to be differences in perceptions. Less than half of the respondents reported that the performance review system supported effective telecommuting with the lowest level of agreement reported among the non-telecommuters (HR practice 7). HR practice 8 refers to whether the performance appraisal system supports those who work offsite. Forty-eight percent of telecommuting employees agree with this statement in comparison to 41% non-telecommuting employees, and 56% telecommuting supervisors agree with this statement in contrast to 49% of non-telecommuting supervisors.

A similar pattern is found for HR practice 9. The majority of telecommuters (both employees and supervisors) agree with the statement that “my supervisor supports telecommuting for people in our work unit” however, only half of the non-telecommuters (both employees and supervisors) agree with this statement. It is unclear whether these differences are due to actual differences in supervisor support or whether they are perceptual differences. HR

Practice 10 is also consistent with the above findings. Telecommuters are less likely to report that their organization requires employees to work during specific work hours. Thus, telecommuters, regardless of whether they are supervisors or employees, clearly have different beliefs and perceptions regarding their organization's support for telecommuting compared to their non-telecommuting counterparts.

Table 8 Perceptions of HR Practices by Telecommuting Status and Job Classification (Percentage Agreement)

	HR Practices	Telecommuters		Non-telecommuters	
		Employee	Supervisor	Employee	Supervisor
		n = 262	n = 88	n = 181	n = 89
1	Sufficient training in telecommuting work skills	30	21	26	25
2	Training in technology, which is sufficient to support those who telecommute	54	61	46	55
3	Sufficient training in communication skills	55	59	51	58
4	Sufficient training in teamwork skills	54	57	61	55
5	Reward structure supports effective telecommuting	43	40	28	30
6	Pay is linked to performance	75	84	73	81
7	Performance review system supports effective telecommuting	40	44	32	35
8	Performance appraisal system supports those who work offsite	48	56	41	49
9	My supervisor supports telecommuting for people in our work unit	77	71	58	52
10	Requires employees to work during specific work hours	48	49	60	61

RESULTS FOR RESEARCH QUESTION 9

Research question 9 deals with HR professionals' perspective on telecommuting issues. Researchers conducted a focus group to gather information on this research question.

FOCUS GROUP

OBJECTIVE

In addition to getting feedback from employees and supervisors from various departments, researchers also wanted to discuss telecommuting issues with HR managers in the San Francisco Bay Area. Thus, the objective for the focus groups was to get in-depth information regarding telecommuting policies within a subset of companies in the Bay Area.

SAMPLE

Seven HR professionals attended the telecommuting focus group. The HR professionals worked for large technology-based companies in Silicon Valley. All the participants in the group were engaged in the discussion and continued discussing the issue beyond the allotted time.

PROCEDURE

Recruiting participants for the focus group involved using multiple approaches to reach out to individuals. There were three specific approaches researchers used: (1) they attended association meetings to promote the focus groups, (2) they networked with researchers' colleagues and friends, and finally (3) they sent letters to the HR departments of each of the companies surveyed. It was extremely difficult to get HR professionals to commit 90 minutes of their workday to attend a focus group, so researchers ended up having only one roundtable focus group.

FOCUS GROUP QUESTIONS

Before beginning the focus group discussion, researchers had a 10-minute presentation highlighting some of the key findings from the online surveys to get the focus group participants thinking about the topic of telecommuting. Following the presentation, researchers asked participants to describe their company's motivation or hesitancy to implement telecommuting programs. The authors also asked them to describe their own perceptions regarding telecommuting and telecommuters within their organization. For instance, does performance management differ for telecommuters? A complete set of questions asked is provided in Appendix B.

FOCUS GROUP RESULTS

The following is a summary of what was discussed in the meeting based on themes that emerged.

Drivers of Telecommuting in Companies

There are three main motivations for telecommuting include cost-saving, employee retention, and employee productivity.

- Cost savings typically occurs as a driver of telecommuting when an organization is facing competitive pressures to reduce expenses.
- Retention as a motivator is typically seen when an organization really wishes to retain a valuable employee and makes an accommodation for that employee so that they don't leave the organization. Often this arrangement is not formalized, and in many cases companies may not even officially recognize they allow telecommuting. In many cases, this is done on a case-by-case basis.
- In the long-term, the main driver of telecommuting should be productivity. If telecommuting can make employees more productive, it will be supported.

To summarize, cost savings and employee retention seem to be the most important reasons that drive companies to offer telecommuting. However, it will only be sustainable in the long run if it improves productivity.

Resistance Factors to Telecommuting

The most significant resistance to telecommuting comes from lack of senior management support, and the organizational culture. Other deterrents to telecommuting are nature of the job and company size.

- Lack of senior management support and a mindset that “you have to be physically present to be effective” makes introduction of telecommuting very challenging. At some of these companies, some employees telecommute one day a week, but management doesn't want to see it (“guerilla teleworkers”).
- Sometimes the nature of the job makes telecommuting difficult. A pattern emerged in the discussion where it was felt that the larger the percentage of non-exempt workers a company has, the more the culture will not support telecommuting. (A non-exempt worker is defined as an hourly worker, who is different from an exempt worker who is paid on a salary basis).
- Smaller companies are also reluctant to let people telecommute because a few missing people can make a significant impact. But some small companies encourage telecommuting to save on overhead.

The above point to the importance of senior management support if telecommuting is to be successful, particularly if the culture is resistant to adopting new ways of working such as those that exist in companies with a lot of blue collar jobs or certain manufacturing environments.

Preconditions for Success

- HP has a “touchdown” area for telecommuters who come in to work in the office. These are community work spaces, provided so that telecommuters will not need their own cubes.

- Managers of telecommuters have to evaluate them on a results basis. They need clearly defined, tangible goals. An MBO (Management By Objectives) culture is necessary in which performance of employees is measured by goals and performance standards as opposed to subjective indicators of performance.
- Need to cut the cord that associates telecommuting with being a perk. Some people are not productive at home. Telecommuting shouldn't be something to strive for.
- The keys are flexibility and productivity.
- Personality and preference may make a difference e.g. which personality type is more likely to be more influential working from a distance.
- Job characteristics may make a difference, e.g. some programs are hard to run over VPN.
- Trust and respect between the manager and the telecommuter are important, which translates into job security.

To summarize the above points, certain cultural preconditions are necessary for the success of telecommuting program. These include understanding that both job characteristics, and personality play a part when approving telecommuting arrangements for specific employees. However, once telecommuting is approved, it is important to provide resources, trust the employee, and evaluate him/her on performance standards that are well-defined, objective standards.

Areas That Need Improvement

- Resources are provided to telecommuters, but typically there is no training.
- When one company implemented a formal telecommuting policy, the number of telecommuters did not change, but the transparency of telecommuting did.
- Some companies have the mentality that is the employee's responsibility to make the telecommuting arrangement work, not the company's. It's a privilege.
- Discrepancy between actual policy and company culture and relationship between employee and supervisor.

Overall it appears that companies expect employees to learn how to be effective as telecommuters, but there is a need to offer training on how it can be done better, so as to alleviate some of the disadvantages that come from working remotely.

Effect of Telecommuting on Employees

- There is some tension between telecommuters and non-telecommuters (for example, "why do they get to telecommute and not me?").

- Higher expectations of availability

This leads researchers to conclude that there is a greater need to understand the interactive effects of the dynamics between telecommuters and non-telecommuters.

Future Trends

- There was a consensus that telecommuting is a growing trend, especially as older managers retire and are replaced by newer managers who realize they have to allow it to remain competitive.
- Global interdependence will affect teleworking, due to the time differences and office hours being incompatible.
- Recognition of the fact that there are different types of telecommuting arrangements that may be effective.
- In companies with a more virtual culture, telecommuting is more accepted (for example, people in the same building use their webcams instead of meeting in a conference room; they could just as easily be on the webcam from home).
- Mixed opinions on the effectiveness of webcam conferences versus face-to-face conferences.
- Google has a very team-oriented culture. In that case, telecommuters would be missing out on that environment.
- Idea of piloting telecommuting programs to see if they work in certain companies.
- Use of technology to monitor productivity. This would help ease the trust issues between managers and employees. But excess monitoring would decrease productivity.
- Companies need training in how to let employees know what their options are and what they would be a good fit for.

In terms of future trends, one can conclude that telecommuting will continue to increase and be accepted as technology gets better. But for that to happen, more training will be important, and more effort will be need to be made to keep the employees involved and engaged in the organization. The use of technology for monitoring, however, is a thorny one, since it may erode trust, and should be used with care.

BENCHMARKING

OBJECTIVE

The main objective of the benchmarking component of this project was to create a database summarizing company policies and practices regarding telecommuting programs in the Bay Area.

SAMPLE

The authors collected survey data on over 200 companies. They then took a subsample of these companies ($n = 68$) and collected additional information on these companies from their websites and from information conversations with company employees. This subsample of the companies is biased toward large corporations since it was easier to get their information from websites than private companies.

PROCEDURE

After conducting the survey component of this project, researchers created a list of the companies that they had received surveys from. A subsample of these companies were examined in greater detail to determine company size, company policies regarding telecommuting practices, and what other work-family balance programs are offered by these companies. Researchers collected this information by reviewing company websites and other archival sources.

BENCHMARKING RESULTS

Of the 68 companies that benchmarking data was gathered for, 19 (28%) companies had formal policies on telecommuting, while 46 companies (68%) had allowed telecommuting informally.

In 24% of companies, the company provided sufficient resources (for example laptops, printers, cell phones, internet access) to enable employees to telecommute. Researchers also wanted to examine who was allowed to telecommute. In 7% of companies, only the top performers or top sales people were allowed telecommuting privileges. Eighteen percent of companies require only direct manager or supervisor approval, while 6% needed approval from upper management. There were 15 companies (22%) that used other procedures for determining who can telecommute (for example seniority, based on employee needs, case-by-case basis).

In addition to telecommuting, many companies offered additional benefits to help the work/life balance. Thirty-seven percent offer health insurance, paid holidays, a 401k, and stock options. Flexible scheduling was offered by 53% of companies. Thirty-eight percent offer special health programs and benefits, such as a gym membership or on-site gym. Child care services or adoption assistance was offered by 29% of companies. Twelve percent have car or shuttle services. Twenty-four percent of companies offer reimbursement for additional schooling or training. Six percent offer product discounts. Gourmet cafeterias

or food rewards are given by 18% of companies. Other or additional work/life balance amenities are offered by 31% of companies.

SUMMARY AND RECOMMENDATIONS

There is a lot that needs to be learned about telecommuting, its adoption and implementation in organizations. Although the Silicon Valley has seen many organizations embrace telecommuting, many organizations still lag behind in telecommuting adoption and implementation and are beset with challenges and obstacles emanating from attitudes of individuals in organizations (Cooper and Kurland 2002; Pearce 2009).

In this study, in which researchers sought to triangulate findings from employees, supervisors and HR managers, the results point to the fact that although telecommuting is a valuable work arrangement for many organizations in theory, it is not easy to implement in practice. Consideration needs to be given in regards to how employees respond to different telecommuting arrangements before telecommuting can be successful and become part of the fabric of the organization.

The research clearly shows that there is no one-size-fits-all telecommuting program and that telecommuting programs may need to be adapted to different situations. This is evident by the findings of a curvilinear relationship between extent of telecommuting and outcomes. This study is the first to report the existence of a curvilinear relation between extent of telecommuting and organizational commitment as well as extent of telecommuting and turnover intentions. This, along with previous findings leads researchers to conclude that moderate levels of telecommuting provide the best balance for managing employee outcomes.

Furthermore, this study strengthened the suggestion by researchers that personality plays an important role. Research findings indicate that there are more extraverts who are telecommuters, along with the finding that organizations are less reluctant to allow high performers to telecommute suggests that some personality types (extraverts) may be more effective under telecommuting arrangements.

Researchers found telecommuters to have higher levels of life satisfaction and higher levels of organizational commitment as compared to non-telecommuters although no differences were found for job satisfaction. This has implications for organizations since a committed workforce is likely to perform at higher levels. Thus, these findings do have policy implications when an organization examines the feasibility of implementing a telecommuting program.

In regards to the interface between home and work domains, one finding that was different from previous research was the finding that in the telecommuters group, there was higher family interference in work as compared to non-telecommuters. This is not a surprising finding given equivocality of findings in prior research (e.g. Lautsch et al.), and the fact that working from home makes employees more accessible to family members who may feel that telecommuter is “available” since they are working at home.

The researchers’ analysis of HR practices related to telecommuting revealed some very interesting findings. They examined whether employees and supervisors have different

perceptions of HR practices depending on whether they telecommute or not. Their finding was that telecommuters, regardless of whether they are supervisors or employees, clearly have different beliefs and perceptions regarding their organization's support for telecommuting compared to their non-telecommuting counterparts. This was evident in that more telecommuters than non-telecommuters felt that organizational reward structures supported telecommuting, and that adequate training in technology was available for telecommuters. Telecommuters also experienced greater support from their supervisors on support for telecommuting, and also felt that the performance evaluation system supported those who work offsite. They were also less likely to feel that the organization required them to work onsite than non-telecommuters.

The focus group findings pointed to several interesting observations. First it was evident that while in some companies telecommuting is “managed” as a system level initiative, in many other companies, telecommuting is an unofficial arrangement or privilege that is more in the nature of an “idiosyncratic deal” (Hornung, Rousseau and Glaser 2008) between a supervisor and an employee. This is not surprising given researchers’ finding that supervisors continue to exercise significant discretion when it comes to allowing telecommuting. Clearly the three main drivers of telecommuting include cost savings, employee retention and employee productivity, and the most significant resistance factors come from lack of senior management support, and the organizational culture. A major precondition for success is that managers of telecommuters have to evaluate them on a results basis. They need clearly defined, tangible goals. What is also important, as one of the HR managers noted, “companies need to cut the cord that associates telecommuting with being a perk.” Personality and preference may make a difference, e.g. which personality type is more likely to be more productive working from a distance. What also will be need to be addressed is that over time employees may develop expectations to be able to telecommute, particularly as global operations and use of technology to communicate becomes more and more prevalent.

This research points to the fact that organizations would benefit from a more fine-grained analysis of telecommuting and its impact on the overall culture and performance of organizations. Having analyzed the data, having examined telecommuting programs of different organizations and having talked with HR managers, it appears that optimal telecommuting programs would involve moderate telecommuting after taking into consideration individual level factors such as personality. An analysis of other variables that affect the curvilinear relation would be the next logical step to dig deeper. This study did not look at specific job characteristics, but it appears that the type of job may be critical in the design of telecommuting programs. The metrics of performance also require a more detailed study of job characteristics, so future research should examine job characteristics that make certain jobs lend themselves to telecommuting. This would be an extremely worthwhile endeavor because it would help organizations design telecommuting programs that are tailored to their needs.

APPENDIX A: SURVEY ITEMS

Job Satisfaction

- In general I like my job.
- In general I like working in my company.
- All in all, I am satisfied with my job.

Life Satisfaction

- In most ways, my life is close to ideal.
- I am satisfied with my life.
- So far I have gotten the important things I want in life.
- If I could live my life over, I would change almost nothing.

Organizational Commitment

- I would be very happy to spend the rest of my career with this organization.
- I feel “emotionally attached” to this organization.
- This organization has a great deal of personal meaning for me.
- I feel a strong sense of belonging to my organization.
- I really feel as if this organization’s problems are my own.
- I feel like “part of the family” at my organization.

Turnover Intentions

- I often think about leaving this organization.
- I will probably look for another job in the next year.

Commuting Perceptions

- I regularly drive to and from work during rush hour traffic.
- If convenient public transportation was available, I would use it.
- My commute to work is stressful.

Perceptions of HR Practices

- My organization offers sufficient training in telecommuting work skills.
- My organization offers training in technology which is sufficient to support those who telecommute.
- My organization offers sufficient training in communication skills.
- My organization offers sufficient training in teamwork skills.
- My organization’s reward structure supports effective telecommuting.
- In my organization, pay is linked to performance.
- My organization’s performance review system supports effective telecommuting.
- My organization’s performance appraisal system supports those who work offsite.
- My supervisor supports telecommuting for people in our work unit.

- My organization requires employees to work during specific work hours.

Supervisor Attitudes Toward Telecommuting

- It is more difficult to evaluate the performance of telecommuters.
- Telecommuters need less supervision than people who do not telecommute.
- Telecommuters are more likely to get laid off.
- Telecommuters are less likely to advance in their career.
- In my organization you have to be a high performer to telecommute.

APPENDIX B: FOCUS GROUP QUESTIONS

1. First, any thoughts or comments on the presentation?
2. Do these findings ring true from your own experiences in the companies you've worked with or the telecommuters you've known?
3. So, your examples are companies who are offering telecommuting as a cost reduction. What are some other drivers or motivations you know for offering telecommuting or teleworking?
4. What about for the other participants? Are there any drivers, talent attraction, talent retention, being green, are any of those potential motivators?
5. If it's so informal, are you able to provide resources and training for these telecommuters?
6. From each of your experiences, does performance management differ for telecommuters? Do they get evaluated differently? Do they have to track their hours or log in what they're doing, compared to the non-telecommuters?
7. Do you think that this manager gives different objectives to the telecommuters versus the non-telecommuters?
8. We found that supervisors said they had a harder time evaluating telecommuters than non-telecommuters. What do you think could be done to evaluate and maybe reward telecommuters?
9. Where do you see the future of telecommuting, teleworking, these alternative work arrangements going in your particular company? What do you see as particular trends? Are more people going to start telecommuting in your workplace? Less people? What do you feel?
10. I'm wondering if technology could help allay some of management's fears by having the employees who are working from home instant message and communicate online via email or instant message what they're doing and what they're tasks are or creating a report or keeping a log.

ABBREVIATIONS AND ACRONYMS

FIW	Family Interference in Work; Family Interfering with Work
HR	Human Resources
IT	Information Technology
MBO	Management by Objective
SIC	Standard Industrial Classification
WIF	Work Interference in Family; Work Interfering with Family

REFERENCES

- Bailey, Diane E. and Kurland, Nancy B. 2002. A review of telework research: Findings, new directions, and lessons for the study of modern work." *Journal of Organizational Behavior* 23(4), 383.
- Barrick, Murray R. and Mount, Michael K. 1991. The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology* 44(1), 1–26.
- Cammann, Cortlandt, Fichman, Mark, Jenkins, Douglas G. and Klesh, John R. 1983. Michigan organizational assessment questionnaire. In *Assessing Organizational Change: A Guide to Methods, Measures and Practice*, eds. S. E. Seashore, E. E. Lawler, P. H. Mirvis and C. Cammann, 71–138. New York: Wiley.
- . 1979. The Michigan organizational assessment questionnaire." Unpublished manuscript, University of Michigan, Ann Arbor, MI.
- Carlson, Dawn S., Kacmar, K. Michele and Williams, Larry J. 2000. Construction and initial validation of a multidimensional measure of work–family conflict. *Journal of Vocational Behavior* 56, 249–276.
- Clark, Lee Anna. 2007. Relationships between the Big Five personality dimensions and attitudes toward telecommuting. Unpublished dissertation.
- Collantes, Gustavo O. and Mokhtarian, Patricia L. 2007. Subjective assessments of personal mobility: What makes the difference between a little and a lot? UC Davis. <http://www.escholarship.org/uc/item/2t52740j>.
- Conlin, Michelle. 2009. Chatty workers actually are best telecommuters. *Business Week*. http://www.msnbc.msn.com/id/31428341/ns/business-management_101/.
- Cooper, Cecily D., and Kurland, Nancy B. 2002. Telecommuting, professional isolation and employee development in public and private organizations. *Journal of Organizational Behavior* 23, 511–532.
- Diener, Ed, Emmons, Robert A., Larsen, Randy J. and Griffin, Sharon. 1985. The satisfaction with life scale. *Journal of Personality Assessment* 49, 71–75.
- Feldman, Daniel .C. and Gainey, Thomas W. 1997. Patterns of telecommuting and their consequences: Framing the research agenda. *Human Resource Management Review* 7(4), 369–389.
- Gajendran, Ravi S. and Harrison, David A. 2007. The good, the bad, and the unknown about telecommuting: Metaanalysis of psychological mediators and individual consequences. *Journal of Applied Psychology* 92(6), 1524–1541.

- Gajendran, Ravi S., Klinger, Ryan and Harrison, David A. 2008. Fickle effects of flexibility: Employee reference frames and the psychological yield from telecommuting. Academy of Management Conference, Anaheim, CA.
- Gibson, Jane Whitney, Blackwell, Charles W., Dominicis, Peter and Demerath, Nicole. 2002. Telecommuting in the 21st century: Benefits, issues, and a leadership model which will work. *Journal of Leadership & Organizational Studies* 8, 75-86.
- Golden, Timothy D. and Veiga, John F. 2005. The impact of extent of telecommuting on job satisfaction: Resolving inconsistent findings." *Journal of Management* 31, 301-318.
- Golden, Timothy D., Veiga, John F. and Simsek, Zeki. 2006. Telecommuting's differential Impact on work-family conflict: Is there no place like home?" *Journal of Applied Psychology* 91(6), 1340-1350.
- Golden, Timothy D. 2006. The role of relationships in understanding telecommuter satisfaction. *Journal of Organizational Behavior* 27, 319-340.
- Haines, Victory Y. III, St. Onge, Sylvie and Archambault, Martine. 2002. Environmental and person antecedents of telecommuting outcomes. *Journal of End User Computing* 14(3), 32-50.
- Harpaz, Itzhak. 2002. Advantages and disadvantages of telecommuting for the individual, organization, and society. *Work Study* 51, 74-80.
- Harrison, David A., Newman, Daniel A. and Roth, Phillip L. 2006. How important are job attitudes? Meta-analytic comparisons of integrative behavioral outcomes and time sequences." *Academy of Management Journal* 49(2), 305-325.
- Hornung, Severin, Rousseau, Denise M. and Glaser, Jurgen. 2008. Creating flexible work arrangements through idiosyncratic deals. *Journal of Applied Psychology* 93(3), 655-664.
- Huselid, Mark A. 1995. The impact of human resource management practices on turnover, productivity, and corporate financial performance." *Academy of Management Journal* 38(3), 635-672.
- Igbaria, Magid and Guimaraes, Tor. 1999. Exploring differences in employee turnover intentions and its determinants among telecommuters and non-telecommuters. *Journal of Management Information Systems* 16(1), 147-164.
- Lamond David. 2000. Personality and telework. In *Managing Telework: Perspectives from Human Resource Management and Work Psychology*, eds. Daniels K, Lamond D, Standen P. Thomson Learning Business Press: London.
- Lautsch, Brenda A., Kossek, Ellen E. and Eaton, Susan C. 2009. Supervisory

- approaches and paradoxes in managing telecommuting implementation. *Human Relations* 62(2), 795–827
- Mayo, Margarita, Pastor, Juan Carlos, Gomez-Mejia, Luis and Cruz, Christina. 2009. Why some firms adopt telecommuting while others do not: A contingency perspective. *Human Resource Management* 48(6), 917–939.
- Meyer, John P. and Allen, Natalie J. 1997. *Commitment in the Workplace: Theory, Research, and Application*. Thousand Oaks, CA: Sage.
- Mokhtarian, Patricia L. 1998. A synthetic approach to estimating the impacts of telecommuting on travel. *Urban Studies* 35(2), 215–241.
- Mokhtarian, Patricia L. and Bagley, Michael N. 2000. Modeling employees' perceptions and proportional preferences for work locations: The regular workplace and telecommuting alternatives. *Transportation Research Part A* 34, 223–242.
- Mokhtarian, Patricia L. and Salomon, Ilan. 1996. Modeling the choice of telecommuting: A case of the preferred impossible alternative. *Environment and Planning A* 28, 1859–1876.
- . 1997. Modeling the desire to telecommute: The importance of attitudinal factors in behavioral models. *Transportation Research Part A: Policy and Practice* 31A(1), 35–50.
- Mokhtarian, Patricia L., Salomon, Ilan and Choo, Sangho. 2005. Measuring the measurable: Why can't we agree on the number of telecommuters in the U.S.? *Quality & Quantity* 39, 423–452.
- Nishii, Lisa H. and Wright, Patrick M. 2008. Variability within organizations: Implications for strategic human resources management. In *The People make the Place: Dynamic Linkages between Individuals and Organizations*, ed. D. Brent Smith, 225–248. New York, NY: Taylor and Francis Group/Lawrence Erlbaum Associates, 2008.
- Nunnally, Jum C., and Bernstein, Ira H. 1994. *Psychometric Theory* (3rd ed.). New York: McGraw-Hill.
- Ory, David T, and Mokhtarian, Patricia L. 2005. The impact of telecommuting on the commute time, distance, and speed of State of California workers. UC Davis: Institute of Transportation Studies. <http://www.escholarship.org/uc/item/1fz1b5nz>.
- Pearce, John A. II. 2009. Successful corporate telecommuting with technology considerations for late adopters. *Organizational Dynamics* 38(1), 16–25.
- Pliskin, Nava. 1997. The telecommuting paradox. *Information Technology and People* 10(2), 164–172.

- Rogg, Kirk L., Schmidt, David B., Shull, Carla, and Schmitt, Neal. 2001. Human resource practices, organizational climate, and customer satisfaction. *Journal of Management* 27, 431–449.
- Shafizadeh, Kevan. R., Niemeier, Debbie. A., Mokhtarian, Patricia L. and Salomon, Ilan. 1997. The costs and benefits of telecommuting: An evaluation of macro-scale literature. California PATH Working Paper UCB-ITS-PWP-98-5.
- Shellenbarger, Sue. 1997. Work and family: Madison Avenue may need to alter image of '90s telecommuter. *Wall Street Journal*, Aug 20. B1.
- Staples, Sandy. 2001. A study of remote workers and their differences from non-remote workers. *Journal of End User Computing* 13(2), 3–14.
- Tremblay, Diane Gabrielle. 2002. Balancing work and family with telework? Organizational issues and challenges for women and managers. *Women in Management Review* 17, 157–170.
- U.S. Census Bureau, 2004
- Van Sell, Mary and Jacobs, Sheila M. 1994. Telecommuting and quality of life: A review of the literature and a model for research. *Telematics and Informatics* 11(2), 81–95.
- Virick, Meghna, Da Silva, Nancy and Arrington, Kristi. 2010. Moderators of the curvilinear relation between extent of telecommuting and job and life satisfaction: The role of performance outcome orientation and worker type. *Human Relations* 63(1), 137–154.

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