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High Tech Tethers and Work-family Conflict: A Conservation of Resources Approach

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Abstract

This is one of the first studies to empirically examine the relationship between wireless communications technology and work interference with family, and results shed light on the motivating factors that influence individuals to continuously engage with mobile technologies, sometimes to their personal detriment. We draw from Conservation of Resources (COR) theory to examine the relationship between using mobile communications technologies during non-work time (e.g., evenings, weekends, vacation) and psychological variables related to work-family conflict and well being, and whether this relationship is mediated by perceptions of job control and detachment from work. We collected data from 139 full-time working adults from a large media organization and analyzed it by conducting two multiple mediation regression models using bootstrapping procedures (Preacher & Hayes, 2008). Results revealed that higher levels of mobile technology use during evenings, weekends and vacations were directly related to higher levels of work-family conflict, operationalized as work interference with family. Technology use was also related to both resource enhancing and resource depleting variables. Specifically, technology use was positively related to job control and negatively related to detachment from work. Job control and detachment from work, in turn, were negatively related to work interference with family. Findings suggested that the mediating effect of detachment on the relationship between technology use and work interference with family was greater than the mediating effect of job control, thus providing evidence to support the COR theory principle that resource loss is more salient than resource gain.

Keywords: conservation of resources theory, wireless communications technology, mobile technology, perceived job control, detachment from work, work interference with family, well being

1. Introduction

1.1 Workplace Connectivity

Scholars have recently suggested that distinctions between work and non-work time are becoming blurred due to the growth of organic, non-bureaucratic organizations and the influence of technological innovations (Hassan, 2003; Kaufman-Scarborough, 2006). In the new millennium there has been an enormous increase in the variety of mobile technologies that enable individuals to connect to the office. As telecommunication and computing costs have plummeted, power and function have increased (Hill, Ferris, & Martinson, 2003). The advent of such portable wireless technologies is creating a new era of connectivity for social and organizational purposes. The latter has been referred to as “workplace connectivity” (Schlosser, 2002, p. 401).

Wireless communication devices were designed to make communicating across time and geographic boundaries easier, causing these boundaries to virtually disappear. From the employer perspective, these technologies are assumed to help to ease the collaboration process and increase productivity among workers by removing temporal and spatial barriers (Lyytinen & Yoo, 2002). In contrast, from an employee perspective the boundaries of time and space that traditionally provided a clear demarcation between work and non-work time are disappearing. Without clear boundaries it becomes possible to remain connected to the workplace from any location, at any time. This may be beneficial for those seeking flexible work arrangements or for those who need to communicate around-the-clock with global partners. Continuous connectivity, however, makes individuals

feel as if they are always “on call” (Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007). Thus there may be adverse effects for individuals who work a full day at the office and then continue to engage with their organization during traditional non-work time (e.g., evenings, weekends, vacation) through mobile computing devices.

1.2 Prior Research

Researchers have begun to examine employee use of mobile technologies after hours to perform job-related functions (Boswell & Olson-Buchanan, 2007; Fenner & Renn, 2004; Golden & Geisler, 2007; Mazmanian, Orlikowski, & Yates, 2006; Richardson & Benbunan-Fich, 2011). For example, Mazmanian et al. (2006) found that the use of mobile devices provided workers with a sense of control, albeit at the possible cost of increased stress over the long term. These studies suggest that there may be both positive and negative outcomes associated with mobile technology use during non-work time. Prior research, however, has not provided an adequate theoretical explanation for this paradox.

Our study seeks to contribute to this emerging area of research by examining mobile technology use from the perspective of Conservation of Resources (COR) theory (Hobfoll, 1988, 1989, 2001). Specifically, we focus our study on work connectivity behavior after-hours (WCBA), defined by Richardson and Benbunan-Fich (2011) as an employee’s “use of portable wireless enabled devices (laptop or handheld) to engage with work or work-related colleagues *during non-work time* (e.g., mornings before work, evenings after work, weekends, or vacations)” (p. 143). Our goal was to examine the relationship between WCBA and employee work-family conflict and well being, as well as potential mediators of this relationship.

1.3 Conservations of Resources Theory

COR theory (Hobfoll, 1988, 1989, 2001) is based on the central tenet that people strive to obtain, build and protect resources they value, and psychological stress occurs when resources are lost, threatened with loss or if individuals fail to replenish resources after significant investment. Hobfoll proposed two important principles of the COR model. The first is that “resource loss is disproportionately more salient than resource gain” (Hobfoll, 2001, p 343). That is, other things being equal, negative events appear to elicit more physiological, cognitive, affective and behavioral responses than neutral or positive events (Taylor, 1991). The second major principle emphasizes the importance of resource investment. Hobfoll (2001) proposed that, “people must invest resources in order to protect against resource loss” (p 349).

According to Hobfoll and Freedy (1993), job demands threaten one’s resources and over time prolonged exposure to such demands will result in strain in the form of emotional exhaustion. In a work setting the rate at which work demands use up employee resources is typically greater than the rate the resources are replenished (Freedy & Hobfoll, 1994). Evidence for the diminishing effect of resource gains over chronic resource loss has been found in several empirical studies that focused on the effects of job demands and resources on burnout (Wright & Cropanzano, 1998; Taris, Schreurs, & Van Iersel-Van Silfhout, 2001).

Recent research has applied COR theory to explain the positive benefits of time away from work. According to Eden (2001) a gain spiral may occur any time resources are replenished, which is more likely to occur during time away from work. For example, Westman and Eden (1997) measured stress and burnout before, during and after vacation among a group of clerical employees. Results showed substantial declines in burnout during the vacation. Westman and Etzion (2001) obtained similar findings among a sample of blue collar workers. Other respite studies have examined time away from work due to computer shutdowns (Eden, 1990), business trips (Westman & Etzion, 2002) and sabbaticals (Davidson et al., 2010). The results consistently point to the restorative benefit of time away from work as an important means for building up an individual’s resources (e.g., resilience).

1.3.1 Conservation of Resources Theory and WCBA

The COR model provides a theoretical framework for examining potential outcomes of work connectivity behavior after hours. According to the model, people are motivated to acquire various kinds of psychological, social and material resources to manage their lives successfully and avoid the negative consequences of stress. For example, employee perceptions of control can serve as a resource by aiding in stress resistance and in turn is related to employee health and well being (Bond & Bunce, 2003; Chen, Westman, & Eden, 2009; Ganster, Fox, & Dwyer, 2001; Thompson & Prottas, 2006). Applying this framework to WCBA, workers may be motivated to remain virtually connected to the workplace because they think it helps them to build or conserve important resources related to their jobs, such as the ability to stay on top of job demands, thus giving them a greater sense of control. At the same time a potential downside of WCBA is that it enables a constant connection to work,

which may impede one's ability to psychologically detach from the job. In the following sections we will describe both the upside (job control) and downside (inability to disconnect from work) of WCBA and describe how these factors may mediate the relationships between WCBA and 1) work interference with family and 2) psychological well being.

1.3.2 WCBA, Work Interference with Family, and Psychological Well-being

Grandey and Cropanzano (1999) applied the COR model to work-family relationships and proposed that interrole conflict causes resources to be lost in the process of juggling both work and family roles. Work-family conflict, a form of interrole conflict, is conflict that arises from mutually incompatible pressures from both work and family (Greenhaus & Beutell, 1985). The construct has been conceptualized as having two components: work interference with family (WIF) and family interference with work (FIW) (Gutek, Searle, & Klepa, 1991). Because mobile technologies provide anytime, anywhere access to the workplace the present study is particularly concerned with the extent to which these technologies are related to work demands interfering with family or personal time. In fact, recent research has found that the use of email, cell phones, PDAs and pagers after hours was associated with an employee's work-to-life conflict, as reported by the employee and a significant other (Boswell & Olson-Buchanan, 2007). Further, work demands that extend beyond normal work hours can deplete an employee's psychological and physical resources---time, energy and focus---normally left over for the family or for one's self, ultimately affecting his or her well being (Halbesleben, Harvey, & Bolino, 2009; Voydanoff, 2004). Based on COR theory we hypothesize the following:

Hypothesis 1: WCBA will be positively related to work interference with family and negatively related to psychological well-being.

1.4 The Mediating Role of Resources

The COR model suggests that personal resources can either replenish or negate loss spirals. For example, Rosenbaum and Cohen (1999) used COR to examine the effect of individual resources (e.g., spousal support, self-control skills) on WIF among working women and found that women who possessed at least one kind of resource were less distressed than those with none. More recently Halbesleben et al. (2009) examined conscientiousness as a personal resource and found that it moderated the relationship between employee engagement and work-family conflict. These studies provide evidence that personal resources may protect against work interference with family and strengthen well being. Likewise, the inability to replenish resources may increase work interference with family and reduce well being. In the next two sections we describe two possible mediators: perceptions of enhanced job control (resource gain) and inability to replenish resources by psychologically detaching from work (resource loss).

1.4.1 Resource Gain: Job Control

Greenberger and Strasser (1986) suggested that individuals are motivated to seek control over their environment. They defined personal control as a psychological construct that reflects an individual's beliefs about his or her ability to change the environment and argued that a variety of situations can increase or decrease employee perceptions of control. For example, employees who have supportive co-workers and supervisors report higher levels of control (Thompson & Prottas, 2006). Research has shown that high levels of perceived control were positively associated with job satisfaction and general well being and negatively associated with turnover, emotional distress and work interference with family conflict (Kossek et al., 2006; Spector, 1986; Thompson & Prottas, 2006).

Several recent qualitative studies suggest that wireless connectivity behavior is related to an increased sense of control. Allen and Shoard (2005) examined BlackBerry use among senior officers in a UK police force who used the devices primarily for sending and receiving emails. Officers reported the technology enabled them to spread the load and respond to messages at all times of the day, which helped to ease peak workload cycles and increase perceptions of control over incoming messages. Mazmanian et al. (2006) conducted a similar study of BlackBerry use among a small U.S. private-equity firm and found comparable results: data from interviews revealed that the ability to monitor incoming messages provided employees with a sense of control. Finally, Golden and Geisler (2007) interviewed 42 professionals about their PDA use, and found that they believed the devices helped them manage the work-life boundary and provided an increased sense of control. Building on this research and COR theory predictions, we expect that job control will mediate the relationship between WCBA and WIF and between WCBA and well being. Specifically employees who engage in work connectivity behavior after hours will experience greater levels of job control, which in turn will be related to perceptions of lower levels of work interference with family and higher levels of well being.

Hypothesis 2: The relationship between WCBA and work interference with family, and WCBA and well being will be mediated by job control.

1.4.2 Resource Loss: Low Psychological Detachment from Work

Etzion et al. (1998) first used the term “detachment from work” to represent “an individual’s sense of being away from the work situation” (p. 579). Psychological detachment from work occurs when employees are not occupied by work-related duties (e.g., receiving job-related phone calls at home) during non-work time (Sonnentag & Fritz, 2007). Studies have shown that how one spends time away from work affects employees’ ability to psychologically detach from work (Fritz & Sonnentag, 2005; Sonnentag, 2001; Sonnentag & Bayer, 2005). A respite alone may not relieve stress if one spends the time thinking about work or engaged in work-related activities.

Researchers have not yet examined the influence of wireless communications technology on respite time. But as Eden (2001, p. 187) noted, “an urgent threat to respite relief is the high-tech tethers clamped on respitees during their time away from their jobs.” Although wireless communication devices allow users to respond to messages at all times of the day, Mazmanian et al. (2006) found that when BlackBerries were introduced to an organization employees began to compulsively check messages and found it difficult to turn off the device even while at home. We therefore predict that detachment from work will mediate the relationship between WCBA and work interference with family and between WCBA and well being. Specifically employees who engage in work connectivity behavior after hours will experience lower levels of detachment from work, which in turn will be related to perceptions of higher levels of work interference with family and lower levels of well being.

Hypothesis 3: The relationship between WCBA and work interference with family, and WCBA and well being, will be mediated by detachment from work.

1.4.3 Resource Loss vs. Resource Gain

Lee and Ashforth’s (1996) meta-analysis on the correlates of job burnout found that over time individuals are more affected by chronic resource demands (e.g., work pressure, work load) than resource gains (e.g., job control, autonomy). People will attempt to minimize net resource losses but the rate at which work demands use up employee resources is typically greater than the rate the resources are replenished (Freedy & Hobfoll, 1994). As discussed earlier, we predict that job control and detachment from work will mediate the relationship between WCBA and work interference with family and between WCBA and well being. It follows from COR theory that chronic resource demands (e.g., inability to detach from work) will be more strongly related to work interference with family and well being than resource gains (e.g., job control). We therefore predict that the mediating effect of detachment from work (i.e., resource loss) will be greater than the mediating effect of job control (i.e., resource gain).

Hypothesis 4: The specific indirect effect of detachment from work as a mediator between WCBA and work interference with family, and WCBA and well being, will be greater than the specific indirect effect of job control as a mediator.

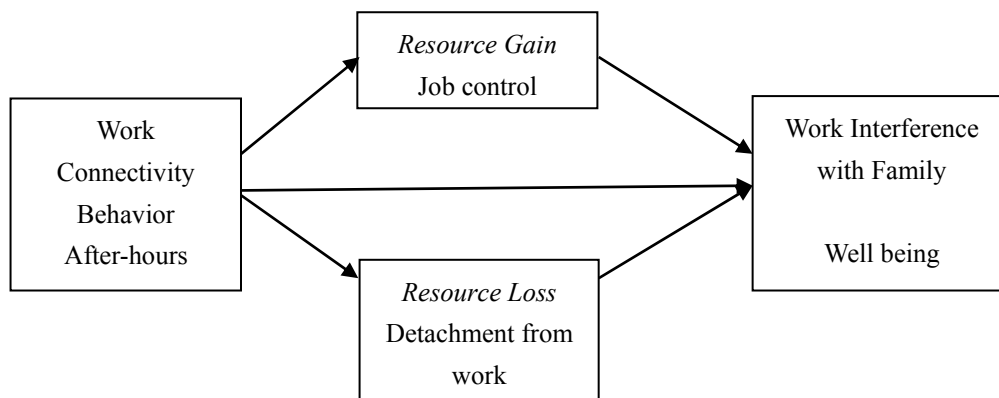


Figure 1. Hypothesized multiple mediation model of work connectivity behavior after hours

2. Method

2.1 Data and Sample

We tested the hypotheses using data collected via an online questionnaire. Participants were members of the marketing division of a media organization in a large city in the northeastern US. The division is responsible for direct and retail marketing of company products. The division president sent an email to all members of the division that described the purpose of the research project and provided a URL link to the web-based questionnaire. Of the 274 emails sent, 139 participants (51%) completed the survey.

2.2 Measures

With the exception of WCBA we measured our constructs through scales validated in prior research. Unless otherwise noted items were rated on a 7-point, Likert-type scale that ranged from 1 (strongly disagree) to 7 (strongly agree).

We measured work interference with family with Kopelman, Greenhaus and Connolly's (1983) 8-item Work-Family Conflict scale (e.g., "My family/friends dislike how often I am preoccupied with my work while I am at home") ($\alpha = .91$), and we measured well being with the General Health Questionnaire-12 (GHQ-12) (e.g., "Have you recently [in the last few weeks] been able to concentrate on what you're doing?"). For this study we reverse coded the answers so that higher scores on the GHQ-12 indicated higher levels of well being ($\alpha = .79$).

For perceived job control we used a 4-item subscale from Kossek et al.'s (2006) 7-item job control scale ($\alpha = .74$). The four items capture personal flexibility, including control over work location and scheduling (e.g., "In my job, I am able to decide on my own about WHERE the work is done," "In my job, I am able to decide on my own about WHEN the work is done"). To be consistent in the format of our survey we reworded the items to be statements rather than questions. Coefficient alpha in this study was .75.

We measured detachment from work using the 4-item psychological detachment subscale of Sonnentag and Fritz's (2007) Recovery Experience Questionnaire (e.g., "During time away from work in the evenings or on weekends I am unable to forget about work," reverse scored) ($\alpha = .89$).

We measured WCBA with items we created drawing from existing literature. The recent work of Burton-Jones and Straub (2006) recommended using diverse conceptualizations of systems usage in the same study. For example, they suggested collecting "lean" measures to capture activity (e.g., duration of use) as well as "rich" measures that incorporate information about the nature of the activity (e.g., breadth of use, context of use). We therefore collected self-reported measures of both duration (e.g., how much time they use the wireless devices) and frequency in context (e.g., how often do you use the devices during particular non-work activities).

First we measured *WCBA duration* by asking respondents to report, on average, how much time they used each device (e.g., wireless email devices and laptops) to perform job-related duties during non-work hours. We collected responses for three time periods (e.g., before work, after work and during days off) and provided response categories in ranges of minutes to create a Likert-type scale (e.g., 1-30 minutes, 31-60 minutes, etc.). Coefficient alpha was .79.

Second to create a measure for *WCBA frequency*, we followed Boswell and Olson-Buchanan (2007) who asked respondents to report the frequency (on a Likert-type scale) with which they used an array of communication technologies to perform their job during non-work hours ($\alpha = .72$). In their study responses to the individual technologies were averaged to create an overall index of reported communication technology use after hours. To improve the reliability of Boswell and Olson-Buchanan's measure, we (1) asked about the use of a specific technological device (e.g., handheld wireless devices, laptops) rather than the communication medium (e.g., email) and (2) we asked how frequently each device is used during a specific non-work activity (e.g., shopping, traveling, dinner with friends, etc.). We averaged the responses to the individual technologies to create an overall index of *WCBA frequency* ($\alpha = .93$).

We also collected the following demographic variables to be used as control variables: age, gender (female = 1, male = 2), marital status (single = 1, married = 2), presence of children at home and job level. We controlled for age and gender because prior research has shown that technology use and acceptance may be affected by age and gender (cf. Harrison & Rainer, 1992). In addition, we controlled for marital status and children because an individual's family structure and family demands may influence technology use after hours and their well being (cf. Boswell & Olson-Buchanan, 2007). We also controlled for job level as it may influence perceptions of job control (Ganster, 1989).

3. Results

3.1 Demographics

Average age of the participants was 34.3 (*SD* 9.0) and 69% were female. Respondents came from varying job levels, including: manager (41%), assistant/associate manager (23%), director (18%), vice president (7%), assistant/associate director (4%), and administrative/other (7%). We obtained demographic information (e.g., age, gender, job level) on the entire division and found it was not significantly different from the sample that responded. Tables 1 and 2 report the results for WCBA frequency by device, showing the activities and events during which employees were most likely to engage in WCBA via a handheld wireless email device or laptop computer.

Table 1. WCBA frequency results: handheld devices

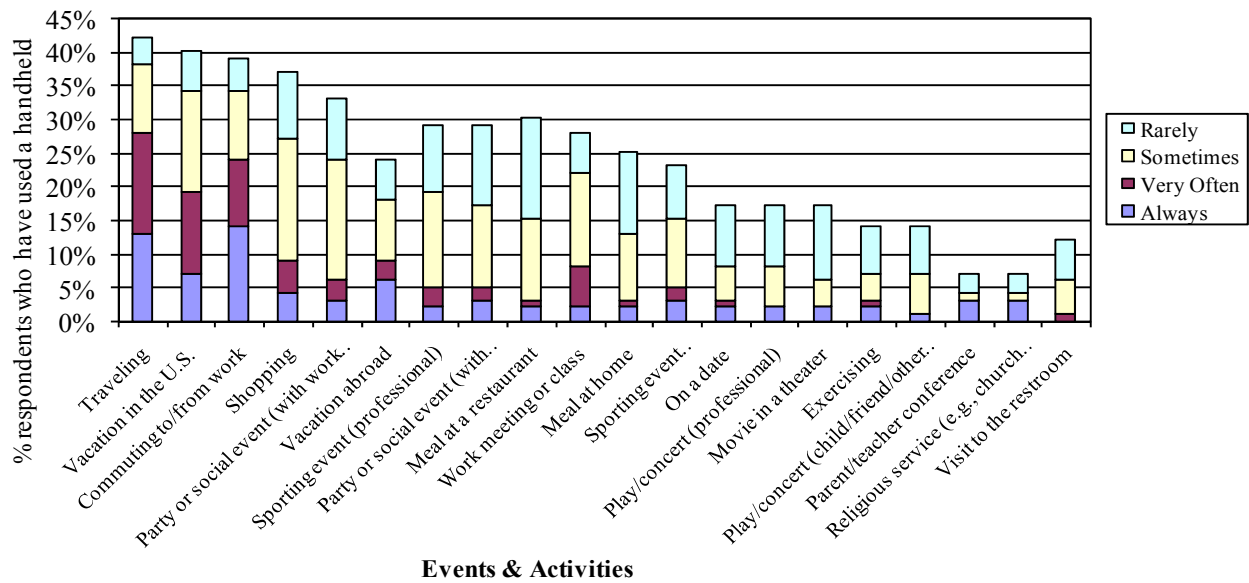
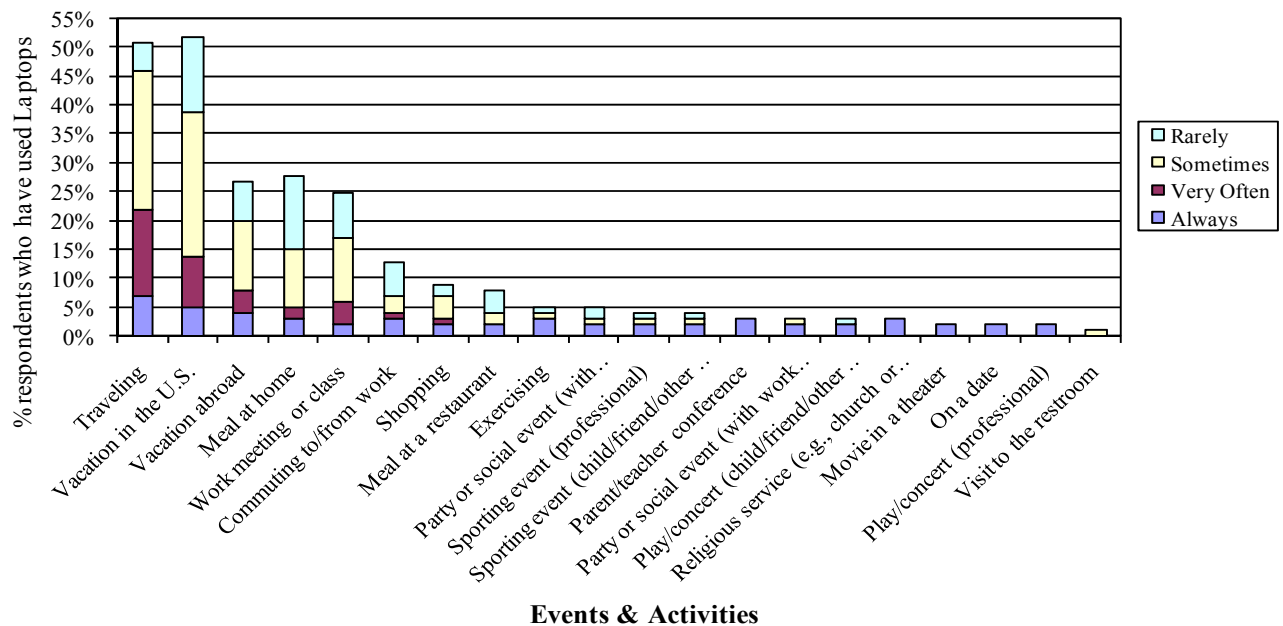


Table 2. WCBA frequency results: laptop devices



3.2 Statistical Analysis

Table 3 provides descriptive statistics and correlations among the constructs as well as Cronbach's alpha reliability coefficients for each of the scales, which ranged from .75 to .93.

Table 3. Descriptive statistics and correlations^a

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Job level													
2. Age	34.29	8.99	.45										
3. Gender			.17	.11									
4. Marital status			.30	.44	.11								
5. Presence of children			-.28	-.42	-.20	-.59							
6. WCBA Frequency	9.85	12.7	.28	.08	.20	.07	-.11	.93					
7. WCBA Duration	3.40	4.2	.06	-.15	-.03	-.09	.03	.61	.79				
8. Job control	4.43	0.86	.23	.34	.00	.03	-.13	.20	.11	.75			
9. Detachment from work	4.85	1.24	-.06	-.12	-.05	.00	.10	-.30	-.28	-.09	.89		
10. Work interference with family	3.62	1.19	.35	-.01	-.03	.00	.00	.23	.26	-.07	-.43	.91	
11. Well being	20.52	4.22	.01	.01	.03	.04	.07	.10	.01	.09	.23	-.40	.79

^aCorrelations greater than 0.17 are significant at the $p < .05$; Alpha internal consistency reliability coefficients for scales appear on the main diagonal in bold.

We first examined the bivariate correlations to test Hypothesis 1. We found mixed support for Hypothesis 1. Work interference with family was related to both WCBA frequency ($r=.23, p<.01$) and WCBA duration ($r=.26, p<.01$), however well-being was not related to either measure of WCBA. For the remaining hypotheses we followed the procedures outlined in Preacher and Hayes (2008) for testing a multiple mediation model. The benefits of such an approach include the ability to examine a set of potential mediators and the ability to control for other mediating effects. This allows us to “determine the relative magnitudes of the specific indirect effects associated with all mediators” (p 881).

We investigated the study hypotheses by testing (a) the total effect of WCBA on work interference with family, (b) the total indirect effect of WCBA on work interference with family and well being through job control and detachment from work, (c) the specific indirect effect of WCBA on work interference with family and well being through job control and (d) the specific indirect effect of WCBA on work interference with family and well being through detachment from work. We ran two models for each dependent variable so that we could examine WCBA duration and frequency separately. This enabled us to compare the different conceptualizations of WCBA usage. We used an SPSS macro from Preacher and Hayes (2008) to conduct the main analyses and utilized bootstrapping procedures to obtain estimates of the indirect effects.

The two models using work interference with family as the dependent variable were both statistically significant with an R^2 value of .383 for WCBA duration and .374 for WCBA frequency, indicating that the independent variable, mediators and control variables accounted for 38% and 37% of the variance in work interference with

family respectively. The two models using well being as the dependent variable however, were not statistically significant with an adjusted R^2 value of .012 for WCBA duration and .037 for WCBA frequency. This provided mixed support for Hypothesis 1. Because the models with well being as the dependent variable were not considered a good fit for the data, further investigation into mediated effects were not performed. Table 4 displays the bootstrapped estimates for the total and specific indirect effects obtained from the main analyses for the work interference with family models.

Table 4. Mediation of the effect of WCBA on work interference with family through job control and detachment from work

Mediator	Bootstrap		BCa 95% CI	
	Estimate	SE	lower	upper
WCBA Duration Model:				
Detachment from work	.0359	.0144	.0132	.0704
Job control	-.0101	.0066	-.0296	-.0013
Total Indirect Effect	.0258	.0152	-.0009	.0598
Detachment vs. Job control	.0460	.0166	.0203	.0871
WCBA Frequency Model:				
Detachment	.0134	.0056	.0032	.0254
Job control	-.0032	.0025	-.0103	.0000
Total Indirect Effect	.0102	.0053	.0008	.0222
Detachment vs. Job control	.0166	.0069	.0046	.0321

Note: Based on 5,000 bootstrap samples. BCa = Bias Corrected and Accelerated; CI = confidence interval.

We next examined the total indirect effects of WCBA on work interference with family through both mediators: job control and detachment from work. Results were not statistically significant for the WCBA duration model [.0258, 95% BCa bootstrap CI (-.0009, .0598)] but they were for the WCBA frequency model [.0102, 95% BCa bootstrap CI (.0008, .0222)]. It is possible however to have significant specific indirect effects in the presence of a nonsignificant total indirect effect (MacKinnon, Krull & Lockwood, 2000; Preacher & Hayes, 2008) and we therefore continued to test the significance of the specific indirect effects associated with the two mediators for both models.

The specific indirect effect of WCBA on work interference with family through job control was statistically significant for WCBA duration [-.0101, 95% BCa bootstrap CI (-.0296, -.0013)] but not for WCBA frequency [-.0032, 95% BCa bootstrap CI (-.0103, .0000)], finding mixed support for Hypothesis 2. The direction of associations between variables however was as expected in both models. Figures 2 and 3 depict the standardized regression coefficients derived from the bootstrap procedure. In Model 1 (Figure 2) WCBA duration was positively related to job control ($B = .05, p < .05$) and job control was negatively related to work interference with family ($B = -.20, p < .05$). In Model 2 (Figure 3) WCBA frequency was positively related to job control ($B = .02, p < .05$) and job control was negatively related to work interference with family ($B = -.18, p < .05$).

The specific indirect effect of WCBA on work interference with family through detachment from work was statistically significant for both WCBA duration [.0359, 95% BCa bootstrap CI (.0132, .0704)] and for WCBA frequency [.0134, 95% BCa bootstrap CI (.0032, .0254)] providing support for Hypothesis 3. In addition the direction of the associations was as expected in both models. In Model 1 (Figure 2) WCBA duration was negatively related to detachment from work ($B = -.10, p < .001$) and detachment from work was negatively

related to work interference with family ($B = -.38, p < .001$). In Model 2 (Figure 3) WCBA frequency was negatively related to detachment from work ($B = -.03, p < .001$) and detachment from work was negatively related to work interference with family ($B = -.41, p < .001$).

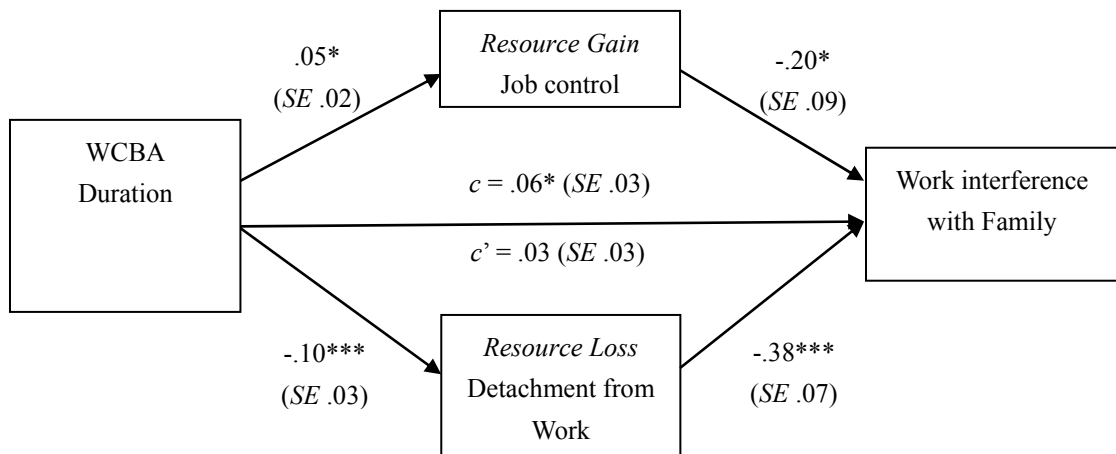


Figure 2. Estimated multiple mediation model based on WCBA duration

Note: The numbers in the figure represent the standardized regression coefficients derived from a bootstrap procedure, SE = standard error, c = total effect of WCBA duration on Work interference with Family, c' = direct effect of WCBA on Work interference with Family. $*p < .05$, $**p < .01$, $***p < .001$, $R^2 = .38$

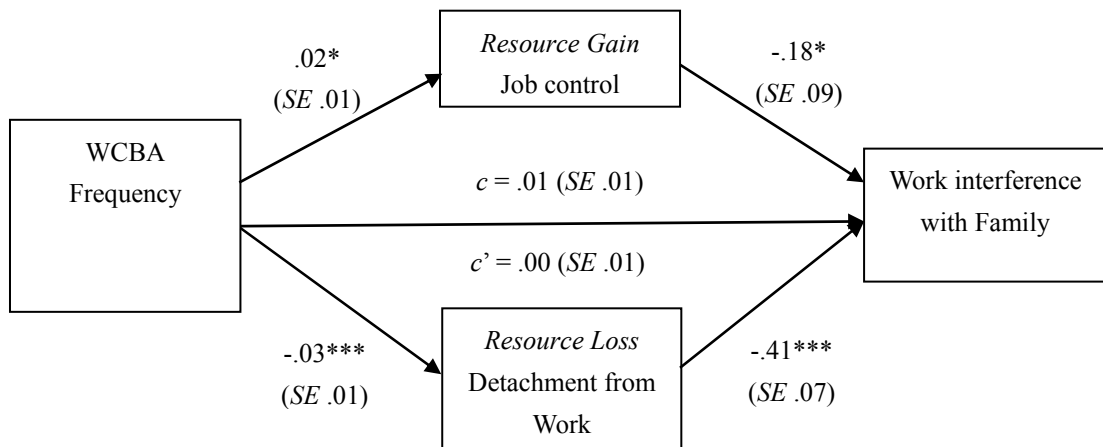


Figure 3. Estimated multiple mediation model based on WCBA frequency

Note: The numbers in the figure represent the standardized regression coefficients derived from a bootstrap procedure, SE = standard error, c = total effect of WCBA duration on Work interference with Family, c' = direct effect of WCBA on Work interference with Family. $*p < .05$, $**p < .01$, $***p < .001$, $R^2 = .37$

Finally, to test Hypothesis 4 we examined the contrast between the individual indirect effect of detachment from work versus the individual indirect effect of job control and found it to be statistically significant for both the WCBA duration model [.0456, 95% BCa bootrap CI (.0203, .0871)] and the WCBA frequency model [.0166, 95% BCa bootrap CI (.0046, .0321)]. This suggests that the specific indirect effect of WCBA on work interference with family through detachment from work is larger than the indirect effect of WCBA on work interference with family through job control, thus supporting Hypothesis 4.

4. Discussion

In the present study we tested a multiple mediation model in which job control and detachment from work were predicted to serve as potential explanatory variables in the relationships between WCBA and work interference with family and WCBA and well being. As predicted we found that WCBA was directly related to work

interference with family. Specifically, higher levels of WCBA were related to higher levels of work interference with family. WCBA however, was not significantly related to well being. It may be that our measure of well being, a shortened version of the GHQ, focuses too narrowly on one aspect of well being---depression---and that other aspects of well being (e.g., life satisfaction) might have been more relevant. It is also possible that well being is further along the causal chain where WIF is one of several factors influencing well being. Although we found a strong correlation between WIF and well being ($r=-.40$), a longitudinal design is necessary to test this supposition.

4.1 WCBA Duration and Frequency

To develop a deeper understanding of work connectivity behavior after-hours we created two ways of conceptualizing it: WCBA duration (e.g., approximately how much time individuals use a handheld wireless email device or laptop) and WCBA frequency (e.g., how often do they use these devices during particular non-work activities or events). We found that although these measures were strongly related to each other ($r=.61$) further examination of the data revealed some interesting distinctions. For example, laptop usage appears to be the driving factor behind WCBA duration: the correlation between WCBA duration with WCBA *laptop* duration was $r=.82$ and with WCBA *handheld* duration was $r=.69$. For WCBA frequency, the driving factor was handheld usage: the correlation between WCBA frequency with WCBA *laptop* frequency was $r=.62$ but with WCBA *handheld* frequency was $r=.94$. These findings shed light on how individuals perceive they are using technology. When asked to report how long they use a particular device to connect to the workplace, employees are more likely to account for time on their laptops, connecting to work in the evenings or on weekends, whereas they report using their handhelds primarily to briefly connect with work in the mornings. By their very nature laptops require a longer investment of time. Users may work in multiple applications at once (e.g., Internet browsing, reviewing and revising documents, responding to email) and therefore more time is spent "connecting." Handheld devices, in contrast, are used primarily for email and voice communication. They are quick – you get binged, you reply and you are done. Although both devices are portable, individuals were more likely to report using their handhelds to connect to work during particular events and activities. So while the duration of interaction with a handheld device may be shorter than with a laptop, the frequency of those interactions is greater.

4.2 Mediating Variables

Even with these distinctions our findings indicated that psychological detachment from work was a significant mediator in the relationship between WCBA and work interference with family for both the WCBA duration and frequency models. This suggests that those individuals who engage in WCBA may be less likely to mentally detach from the demands of work once they leave the office, which in turn is related to elevated levels of work-family conflict. A significant number of respondents reported using their handheld wireless devices (34%) and laptops (39%) to engage with work or work-related colleagues during vacations both in the United States and abroad. This is a particularly alarming finding since a large body of research on respites has consistently found that time away from work provides a restorative benefit and promotes recovery from job-related strain (Davidson et al., 2010; Eden, 1990; Etzion et al., 1998; Westman & Eden, 1997; Westman & Etzion, 2001, 2002).

The data provided mixed results as to whether job control is a significant mediator in the relationship between WCBA and work interference with family since only the WCBA duration model supported this hypothesis. As noted above the WCBA duration measure is driven by laptop usage, which suggests that using a laptop provides workers with a greater perception of job control. Perhaps this is because laptops enable employees to not only respond to email and instant messages but also to work on reviewing and revising documents, conduct research online or remotely connect to office files. The WCBA frequency model, which is driven by handheld usage, did not find support for the mediation of job control. This was initially surprising given that prior research had found a relationship between using wireless email devices and perceptions of control (Allen & Shoard, 2005; Mazmanian et al., 2006). One explanation for this discrepancy may be that these prior studies, which were qualitative, examined the effect immediately after the introduction of the technology to the organization. This is a limitation in the current study since we did not measure how long organization members had the devices. Perhaps perceptions of job control do increase right after the technologies are distributed to organization members. Employees may be excited to receive the latest smart phones and feel these devices are going to enable them to work more efficiently and effectively. This may be an illusion of control however, and over time organization members may begin to realize that the technology does not change their workload or provide the control they had hoped it would.

Finally, when we examined the contrast between detachment from work as a mediator versus job control, the data indicated that the individual indirect effect of WCBA on work interference with family is larger for detachment from work than for job control in both models. This finding lends support for the COR principle that resource loss is more salient than resource gain (Freedy & Hobfoll, 1994; Lee & Ashforth, 1996). So although the job control afforded by a mobile technology device may provide some resource-enhancing benefits to decrease work-family conflict, the chronic resource demands associated with mobile technology (e.g., inability to psychologically detach from work) appear to have a stronger relationship with work interference with family than the related resource gains (e.g., increased job control). Halbesleben et al. (2009) similarly found that despite the positive aspects of worker engagement the downside is that highly engaged employees are more likely to experience work interference with family. Thus even though mobile technologies provide anytime, anywhere access to the workplace, they may also open the door to workplace demands during family time.

4.3 Limitations

These findings should be interpreted in light of the limitations of the current study. First, the cross-sectional design limits the ability to assess causality. The models as depicted in Figures 1 – 3 imply that WCBA is an antecedent of job control, detachment from work and work interference with family, although it is conceivable that the opposite may be true. For example a mother who cannot attend her child's soccer game on a Saturday due an important work deadline (i.e., work interference with family) might end up going to the game with laptop in hand, thus engaging in WCBA. As noted earlier longitudinal research is needed to determine causality.

Second, as it was not possible to collect more objective data such as actual WCBA from the organization we studied, our findings may be influenced by common method bias. Ideally future researchers will assess connectivity behavior by getting permission to review employee cell phone records to measure frequency, timing and duration of using handheld devices. Further, it would be helpful to examine family members' perceptions of employee connectivity behavior to see whether employee reports of WCBA are in line with family members' observations.

Third, the findings of our study may not be generalizable to other populations and to other settings. The respondents were from a single organization in the northeastern United States. While the results from this sample may be generalizable to similar departments within comparable media organizations from the same city we cannot rule out that idiosyncratic factors specific to this organization had an influence on the results. For example, our sample was relatively young (average age 34.3, *SD* 9.0) and research has shown that younger employees may be more comfortable using technology (cf. Harrison & Rainer, 1992). In addition the expectations to connect to the workplace from the outside likely differ across organizations.

A fourth potential limitation relates to the definition and measurement of WCBA, which we defined as an employee's use of portable wireless enabled devices to engage with work or work-related colleagues during non-work time. This definition does not include instances when an employee leaves the office during the workday to attend a child's soccer game and uses their BlackBerry to monitor messages. If the boundaries between work and non-work time are becoming more fluid then perhaps the terms "before work" and "after work" are becoming less distinct. Furthermore, we measured WCBA duration by asking survey participants to report how often they used their devices to perform job-related duties "before work, after work and during days off." Respondents however, may consider the terms "before work" and "after work" differently. For example, is responding to emails on the morning train considered "before work" time or is this just an extension of the workday? If technology allows employees to begin working before they leave the house, when do people feel their workday begins? Future studies are needed to address these nuances. In addition, rather than ask respondents to report exactly how much time they used the devices, we provided them with a range because we wanted to collect data for three different time periods (e.g., before work, after work and during the weekends) as well as across two devices (e.g., smart phone, laptop). We felt that asking them to report exact minutes for each of these categories would be both difficult and tedious, as opposed to a drop-down box with response categories. We sacrificed some accuracy in order to make sure we did not experience response drop-off. We believe however, that our conceptualization of WCBA in this study, in terms of duration and frequency, provides initial insight into how this behavior may be related to perceptions of job control, psychological detachment and WIF.

4.4 Implications

There are both theoretical and practical implications of this research. The results provide preliminary support for the application of COR theory to better understand the motivating factors that influence individuals to continuously engage with mobile communications technology, sometimes to their personal detriment. In

particular, although there may be positive benefits to staying connected to the workplace (e.g., perceived job control), individuals should also be aware of the potential downside of failing to “unplug” from work.

The current study was one of the first to empirically examine the relationship between wireless communications technology and work interference with family. The results were not encouraging as we found support for the COR theory principle that resource loss is more salient than resource gain. Findings revealed that although WCBA is related to job control, it is more strongly related to low psychological detachment from work. That is, the inability to detach, a source of resource depletion, more strongly mediates the relationship between WCBA and WIF than job control. This suggests that over time individuals who engage in WCBA may be at risk for developing psychological (e.g., depression, anxiety) and/or behavioral (e.g., performance, absenteeism) symptoms of burnout and stress. Again, to examine loss spirals and their consequences, future researchers should employ a longitudinal design.

Employers need to be aware that the health of their employees may be affected by the continuous connection to the workplace afforded by mobile technology. Organizations are increasingly concerned about the potential for lawsuits by employees who feel their Blackberries have led to chronic insomnia, premature burn-out, failed marriages and automobile accidents (Goodchild & Hodgson, 2006). In addition, some employees may be unable to judge when technology has begun to govern their activities rather than facilitate them (Porter & Kakabadse, 2006). It is unlikely that the tools of connectivity will disappear from organizational life. On the contrary, the next generation of workers is highly familiar with these devices and will have grown up using them, albeit conversing with friends and family as opposed to bosses and co-workers. As organizational scholars we should continue to seek whether these technologies are truly blurring the distinction between work and non-work time and whether the overall consequence to one's health is positive or negative.

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