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After hours teleworking and boundary management – Effects on work-family conflict and exhaustion

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Abstract. This study examined how teleworking outside regular office hours, i.e. after hours, relates to work-family conflict and exhaustion. The study also examined how the management of boundaries between work and non-work relates to work-family conflict. A total of seventy-one fulltime employees from a multinational high-tech firm answered a web survey. Contrary to stated hypotheses, analyses revealed that the extent of teleworking after hours was unrelated to work-family conflict and exhaustion. However, having more permeable boundaries and allowing work to interrupt non-work behavior was related to higher conflict. Practical implications and directions for future research are discussed.

Keywords: Teleworking, telecommuting, after hours, work-family conflict, boundary management, exhaustion

Teleworking (or telecommuting) typically involves using computer technology to work away from the main worksite for a proportion of the workweek (e.g., Bailey & Kurland, 2002). It offers many potential benefits for employees and employers alike (Kurland & Bailey, 1999; Mann & Holdsworth, 2003).[1] One often-stressed benefit for employees is increased flexibility. The flexibility (time and space) may help employees to better regulate and synchronize the demands between work and family (e.g., Gajendran & Harrison, 2007). As a result, teleworking is popularly presented as a way to alleviate work-family conflict - a conflict stemming from competing roles in the work and family domains (Madsen, 2003). This is a very important benefit since work-family conflict has been linked to a range of negative outcomes such as exhaustion and depression. However, research demonstrating that this work mode actually lowers work-family conflict has been inconsistent (Allen, Johnson, Kiburz, & Shockley, 2012; Gajendran & Harrison, 2007; Golden, Veiga, & Simsek, 2006; Shockley & Allen, 2007). This highlights the need for more fine-grained studies that can establish under which conditions teleworking may have a beneficial effect (Shockley & Allen, 2007).

One aspect often overlooked in research on work-family conflict is *when* employees telework (Golden, 2012; Steward, 2000), with some exceptions (e.g., Duxbury, Higgins, & Mills, 1992; Duxbury, Higgins, & Thomas, 1996; Fenner & Renn, 2010; Golden, 2012). In fact, there is currently little understanding of how the use of technology to complete work outside the regular office hours relates to important aspects of work and work-life outcomes (Boswell & Olson-Buchanan, 2007). More studies focusing on the timing of telework are thus needed, e.g. studies on how teleworking outside the regular office hours is related to work-family conflict.

Little attention in research has also been given to how employees actively manage the boundaries between work and non-work (Bulger, Matthews, & Hoffman, 2007), which

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[1] Some of the potential benefits for employers are reduced overheads, increased productivity, and the ability to attract skilled personnel who cannot work full-time at the conventional office (Kurland & Bailey, 1999; Mann & Holdsworth, 2003).

may provide further insight on how teleworking affects levels of conflict. Boundary/border theory (Ashforth, Kreiner, & Fugate, 2000; Clark, 2000) highlight that as work and family becomes more integrated - which is likely to occur as a result of being able to telework from home - boundaries between the two domains also become more permeable. This means that work may interrupt family and vice versa to a larger extent. Consequently, employees need to have a boundary management strategy in order to control when and how they telework and to handle demands effectively (Kossek, Lautsch & Eaton, 2006). This is likely of growing importance when boundaries (physical, temporal, mental) are becoming more blurred. However, only recently has researchers begun to examine work-family boundaries more intensively (Bulger et al, 2007). In fact, to date little is known about how differences in management of boundaries relate to work-life outcomes (Kossek et al, 2006). More research linking these variables is thus warranted.

To sum up, previous telework research has generally tended to overlook *when* employees telework (Golden, 2012). Little is for instance known about how telework outside the regular office hours is related to work-life outcomes (Boswell & Olson-Buchanan, 2007). Furthermore, how teleworkers manage converging boundaries could provide further insight on the relationship between this form of work and work-family conflict. Yet, to date few empirical studies exist on how boundary management is related to work-life outcomes (Kossek et al, 2006).

This study addressed these gaps by examining the effect teleworking after hours and boundary management have on work-family conflict and exhaustion. First, it examined how the extent of teleworking after regular office hours is related to both forms of work-family conflict, i.e. work interference with family (WIF) and family interference with work (FIW). To enable comparisons, both telework during and outside regular office hours has been measured and included in the analysis. However, the focus has been on the latter – defined in this study as telework conducted from home outside a regular Monday to Friday 8 am to 5 pm workweek. It has been referred to as "teleworking after hours" and can be considered a form of supplemental work since it represents work conducted by fulltime employees after regular office hours.[2] The study also examined how differences in boundary management relate to WIF and FIW. Boundary management was studied by focusing on the degree of boundary permeability an individual has between work and non-work. The potential link between teleworking after hours and exhaustion was also examined.

In sum, this study has looked at the relationship between: (1) the extent of teleworking after hours and WIF/FIW, (2) boundary management (in the form of boundary permeability) and WIF/FIW, and (3) the extent of teleworking after hours and exhaustion.

Theory

Teleworking after hours. Telework lacks a generally accepted definition (Baruch, 2001; Ellison, 1999; Hill, Ferris, & Märtinson, 2003; Lundberg & Lindfors, 2002; Standen, Daniels, & Lamond, 1999; Sullivan, 2003). However, it is often characterized as paid work carried out to some extent from outside the traditional workplace with the aid of information and communication technology (Lundberg & Lindfors, 2002; cf.,

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[2] It should nevertheless be stressed that it is possible to conduct this form of work without extending the length of the workday (Fenner & Renn, 2004). For instance, a teleworking employee (with flextime opportunities) could possibly chose to postpone the workday and work later in the evening instead.

Bailey & Kurland, 2002; Baruch, 2001; Gajendran & Harrison, 2007; Golden, 2006, 2009; Kurland & Cooper, 2002; Standen et al., 1999). While the work may be carried out from a range of locations (hotels, cafes, etc.), employees have been found to most commonly allocate their time between the home and the main worksite (Madsen, 2003).

Previous telework research on work-family conflict (WFC) has focused on studying the extent of teleworking (i.e. the quantity) and/or making generalized comparisons (Golden, 2012). Research that considers when work is conducted more closely is lacking. A potential cause for this gap in research might be the ambiguity in the definition. More precisely, telework is considered to involve a substitution of work hours between the office and the home location, and the substitution is thought to take place only during regular office hours (Steward, 2000). However, telework is not only conducted during regular work hours as it has been treated and studied (Golden, 2012). It is thus important to look at when employees telework more closely. Failing to do so makes it difficult to establish why this form of virtual work influences work-life outcomes (e.g. WFC and exhaustion).

Despite the limited attention given to when work is conducted, studies on what might loosely be described as "teleworking after hours" and WFC nevertheless exist. A mix of names and definitions has been used, e.g. "after-hours teleworking" (Duxbury et al, 1992), "computer-supported supplemental work at home" (Duxbury et al, 1996), "technology aided supplemental work" (Fenner & Renn, 2004, 2010), "communication technology usage after hours" (Boswell & Olson-Buchanan, 2007), and "work connectivity behavior after hours" (Adkins & Premeaux, 2014). These studies by and large find that using technology to conduct work after hours is problematic in terms of work-family conflict.[3] Yet, apart from Duxbury et al (1992), none of the empirical studies above examined specifically the extent of "teleworking after hours" and both directions of work-family conflict as in this study. None of these studies looked at how this form of work relates to exhaustion either.

Work-family conflict. Work-family conflict (WFC) has been defined as "a form of inter-role conflict in which the role pressures form the work and family domains are mutually incompatible in some respect" (Greenhaus and Beutell cited in Madsen, 2003, p. 36). The role pressure is thought to generate moods or states, which affect wellbeing in both the work and family domain (Standen et al, 1999). Indeed, WFC has been linked to adverse outcomes such as psychological distress, depression, somatic complaints, and exhaustion (Madsen, 2003). It has also been found to influence e.g. job satisfaction, life satisfaction, organizational commitment, and turnover (Carlson, Kacmar, & Williams, 2000).

The WFC construct has been refined in important ways over the years (Kreiner, 2006). For instance, researchers have acknowledged the benefit of separating the conflict in two dimensions: work interference with family (WIF) and family interference with work (FIW) (see e.g., Carlson et al, 2000; Golden et al, 2006; Gutek, Searle, & Klepa, 1991; Kreiner, 2006; Netemeyer, Boles, & McMurrian, 1996). WIF occurs e.g. when one has to skip family activities in order to be able to complete work tasks. FIW occurs e.g. when family responsibilities interfere with one's work responsibilities. Although both types of conflict has been found to be consistently

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[3] Adkins and Premeaux (2014) did not find that technology usage after hours was related to an increase in WFC. They found that the extent of work conducted after hours was related to higher levels of WFC.

negatively related to desirable outcomes, the negative effect of WIF has been found to be much greater (Fenner & Renn, 2004). That it, WIF is more problematic than FIW.

Research has also tended to divide the construct into different forms depending on source (Kreiner, 2006). The emphasis has been mostly on time-based and strain based conflict (e.g., Golden, 2012; Golden et al, 2006). Time-based conflict occurs when the amount of time devoted in one domain (work or family) interferes with performing responsibilities in the other domain (Netemeyer et al., 1996). Strain-based conflict occurs when strain created in one domain interferes with performing responsibilities in the other. Both forms were measured in this study. No distinction was made in the presentation of the results though as they tend to be intertwined (Golden et al, 2006).

Telework after hours and work-family conflict. Telework after hours has been suggested to have both potential cost and benefits in terms of this role conflict (Duxbury et al, 1992, 1996). It could reduce WFC since it increases time and space flexibility, gives more control over the pacing and scheduling of the work, and increases the opportunity to spend time with family. However, this form of work could also increase WFC (e.g., Duxbury et al, 1992, 1996; Fenner & Renn, 2004, 2010). For instance, less rigid boundaries between work and the home environment can create confusion about when to enact the work role versus the family role (Ashforth et al, 2000). The colocation of the work and family domain, as inevitably happens when working from home, may also generate more unwanted interruptions from either domain. This may also make it difficult to psychologically disengage roles, and consequently exacerbate role conflict.

Although potential benefits and costs exist, it is argued in this study that teleworking outside the regular office hours is generally a bad thing for both forms of WFC. For instance, by engaging in this form of work, the employee is likely detracting from personal time since the work is conducted outside the regular office hours. It might also be used as a form of supplemental work and thereby augment the amount of hours worked per week. This is problematic since a plethora of studies have linked work hours to increased levels of conflict (Hill et al, 2010). Previous studies have generally also found that teleworking outside regular office hours is linked to higher WIF. For instance, Boswell and Olson-Buchanan (2007) as well as Fenner and Renn (2010) found that conducting work from home using technology after regular office hours was related to higher WIF. Duxbury et al (1992) similarly found a positive relationship between teleworking after hours and WIF. Duxbury et al (1996) found that employees teleworking after hours had higher levels of WFC (not specifically WIF though) than those not engaged in this form of work. Based on these findings and the potential negative effects presented above, I propose:

H1: The extent of teleworking after regular office hours is related to higher levels of work interference with family (WIF).

Duxbury et al (1992), but none of the other studies above, also investigated the relationship between teleworking outside regular office hours and FIW. No significant relationship was found. Yet, as teleworkers weaken the boundaries that normally separate the work domain from the family domain, they arguably become more accessible for demands and request of family members (Golden et al, 2006). This might

lead to frequent, unwanted work interruptions, and consequently increased FIW. Other family members might for example not acknowledge or respect that work is conducted during evenings and weekends. This in combination with risks such as role-confusion and problems with detachment (e.g. from a family role) (see Ashforth et al, 2000), it is likely to expect that this form of work increase rather than decrease FIW. Hence, I propose:

H2: The extent of teleworking after regular office hours is related to higher levels of family interference with work (FIW).

Boundaries and boundary management. How work-non-work boundary management relates to work-family conflict was also focused upon in this study. There is currently little knowledge regarding this, in part because researchers only more recently has begun to examine work-non-work boundaries and how they are managed (Bulger et al, 2007).

Nippert-Eng (1996) (referred to in Bulger et al, 2007) suggested, in her work on boundary theory, that individuals actively and deliberately create boundaries (mental, physical, etc.) for work and personal life roles; some create such boundaries to segment their roles and domains, while others create weaker boundaries in order to integrate. She also suggested that these preferences range on a continuum from integration to segmentation, but that the actual integration/segmentation is influenced by other factors as well, e.g. family members, co-workers, and type of occupation.

Ashforth et al (2000) and Clark (2000) further developed boundary theory. Ashforth et al (2000) examined the everyday transitions that occur between boundaries, and the benefits with integration and segmentation, respectively. Clark (2000) made propositions e.g. about the creation and management of work-family borders, and what influences the strength of such borders. However, Clark (2000) labeled her work "work/family border theory". In contrast to boundary theory, she also focused specifically on the work and family domains, and not personal life domains more broadly (Desrochers & Sargent, 2004). However, despite this key difference and despite being termed differently, great similarities exist between border and boundary theory (Bulger et al, 2007; Desrochers & Sargent, 2004; Desrochers, Hilton, & Larwood, 2005).

One of many similarities between boundary and border theory is the active engagement of individuals, i.e. the management of boundaries (Ashforth et al, 2000; Clark, 2000). Both theories also propose that boundary strength depend on two factors: flexibility and permeability. Flexibility is the extent to which a boundary (spatial and temporal) may contract or expand depending on the demands of one domain or the other (Clark, 2000). For instance, a work boundary is more flexible in terms of time if the employee can choose when to work (as with flextime), and more flexible in terms of space if the employee can choose where to work (as with telework). Permeability of a boundary is the degree to which elements from other domains may enter. Alternatively, it can be described as being physically located in one domain (e.g. the home), but behaviorally responding to the other domain (e.g. work) (Ashforth et al, 2000). Furthermore, as there might be asymmetry, it is important to also acknowledge the direction of the permeability (Ashforth et al, 2000; Kossek, Ruderman, Braddy, & Hannum, 2012; Olson-Buchanan & Boswell, 2006). An employee might for instance read and respond to personal messages during work time (non-work to work

permeability), but not respond to work calls during free time away from work (work to non-work permeability). Therefore, the directionality was focused upon in this study.

Boundary management and work-family conflict. From a theoretical perspective, there are both potential costs and benefits with segmentation and integration (Ashforth et al, 2000). Segmentation (indicated by strong boundaries with low flexibility and low permeability) decreases role blurring, but switching roles and crossing boundaries is more demanding. Integration (i.e. high flexibility and permeability) makes the role switching less effortful, which could give employees a better chance to effectively manage conflicting work and family roles. However, there is risk of blurring of boundaries. The blurring could exacerbate role-conflict by creating confusion regarding whether a work or a family role should be enacted. Having higher integration and more permeable boundaries between domains may also lead to more interruptions from work to family and vice versa. This may make it difficult to psychologically disengage one role in favor of another. In sum, integrating and having high permeability between domains may result in benefits in terms of WFC, but there are also many potential costs.

When analyzing the cost and benefits, it is nevertheless important to remember that individuals vary not only in their preferences for integration vs. segmentation, but also how effectively they succeed in managing boundaries (see Kossek et al, 2006). Some may for example handle very permeable boundaries without experiencing any problems. Yet, given the increased cognitive complexity of having more permeable boundaries and the potential problems that may arise (such as frequent interruptions, role-confusion, and problems with role-detachments), it is argued in this study that higher permeability (and thus higher integration) is linked to higher rather than lower WFC. This is also supported by some empirical studies. Regarding work to non-work permeability and WIF, several studies have reported a positive relationship (Olson-Buchanan & Boswell, 2006; Bulger et al, 2007; Kossek et al, 2012). There have also been studies reporting a positive relationship between non-work to work permeability and FIW (Bulger et al, 2007; Kossek et al, 2006, 2012). Given these findings, as well as the potential problems with having more permeable boundaries and higher integration mentioned above, I propose:

H3: Higher work to non-work permeability is related to higher levels of work interference with family (WIF).

H4: Higher non-work to work permeability is related to higher levels of family interference with work (FIW).

The two hypotheses focus only on what might be described as within-domain relationships, but it is of course possible that work to family permeability is related to FIW as well, or that non-work to work permeability is related to WIF. Yet, these potential relationships were not studied since previous work-family research has suggested that within-domain relationships should be stronger (Bulger et al, 2010).

Work exhaustion and telework after hours. This study also focused on the relationship between telework after hours and exhaustion. Work exhaustion (hereafter referred to only as "exhaustion") occurs when individuals feel that they are unable to cope with the demands placed upon them (Hobfoll, 1989). Exhaustion has been defined as

"depletion of emotional and mental energy needed to meet job demands" (Moore, 2000b, p. 336). Furthermore, it has been linked to a range of negative outcomes such as physical illness, reduced satisfaction, increased absenteeism, lower job performance, and turnover (e.g.; Golden, 2012; Moore, 2000a, b). The research on exhaustion, however, has generally studied traditional work modes rather than teleworkers (Golden, 2012; Sardeshmukh, Sharma, & Golden, 2012). In fact, the literature is only beginning to consider teleworking and its potential impact on exhaustion (Golden, 2012).

As mentioned, telework after hours entails both potential costs as benefits for employees (e.g., Duxbury et al, 1992, 1996). It is nevertheless argued here, referring to boundary theory and conservation of resources theory (COR), that this form of work is related to an increase in exhaustion. According to COR theory individuals strive to retain, protect, and build resources such as energy and time (Hobfoll, 1989). Moreover, during times of recovery, individuals attempt to recover and stockpile recourses to counter future losses. This is important since individuals with more resources are less vulnerable to losses and have a better chance of avoiding total depletion. Since telework after hours infringe on personal/family time, this form of work should arguably have a negative impact on recovery and stockpiling of resources, increasing the likelihood of exhaustion. Moreover, telework after hours may foster boundary blurring and problems with role-detachments (e.g., Ashforth et al, 2000; Clark, 2000). It should therefore be more problematic for employees to use the home as a place of refuge and restoration (see e.g., Hartig et al, 2007), leading to a draining of resources and higher levels of exhaustion. Therefore, I propose:

H5: The extent of teleworking after hours is related to higher levels of exhaustion.

Method

Respondents

This study was conducted in collaboration with the Swedish headquarter of a multinational high-tech firm with nearly 100 000 employees worldwide. The sample consisted of employees that report to the "Enterprise department" (ED) or the "Public Sector department" (PSD), respectively. These two departments are similar, e.g. the employees at these departments have similar tasks. However, while ED focuses on sales towards companies and partners, PSD focuses on large actors in the public sector. The total sample consisted of 104 employees from these departments.[4]

The respondents consisted of 46 male and 25 female fulltime employees with an average age of 43 years. They had been working at the company for 9 years on average (ranging from 1 to 23 years). Of the respondents, 70 % were married and 89 % were parents with children living at home. They held a variety of positions; 68 % worked as salesmen, 14 % as sales managers or sales directors, 13 % had technically oriented roles, 4 % worked as business developers, and 1 % had administrative roles. All respondents spent some amount of time working from home every week. Teleworking after hours was 9.4 hrs per week on average, while total extent of teleworking was 19.0 hrs per week on average.

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[4] Employees not employed directly by the company (such as consultants) were not included in the study.

Statistical analyses were conducted in order to determine if respondents differed from non-respondents at the two departments. A Chi-square test for independence (with Yates Continuity Correction) indicated that there was no significant difference in the gender proportion between the respondent and non-respondent group, χ^2 (1, n = 104) = .34, p = .56, phi = .08. No significant difference in the proportion of salesmen could be found either, χ^2 (1, n = 104) = 1.85, p < .17, phi = .16. A non-response bias in terms of gender and occupational role (vis-à-vis the proportion of salesmen) thus seems unlikely.[5]

Design and procedure

A web-based survey was emailed to the employees at the two departments. The survey included a short appeal from the PSD director, who sent an email with information about the survey to the employees at two occasions to encourage participation. The survey took place during 8 weeks in May and June 2014. Reminders were sent by e-mail to those that had not responded. When the data collection ended, 71 usable responses had been received. This represented a 68 % response rate.

Measures

Work-family conflict. An 8-item measure developed by Gutek et al (1991) was used to assess levels of WIF and FIW (see Appendix). Although this measure is a WFC scale, it relates to an individual's personal life more generally (Boswell & Olson-Buchanan, 2007). The items are thus relevant even for persons without a family or a partner. The Likert scales ranged from 1 (strongly disagree) to 5 (strongly agree). Items measuring WIF included e.g.: "After work, I come home too tired to do some of the things I'd like to do" and "On the job I have so much work to do that it takes away from my personal interests". Items measuring FIW included e.g.: "I'm often too tired at work because of the things I have to do at home" and "My personal demands are so great that it takes away from my work".[6] After the survey ended, the items were averaged for each scale to produce overall ratings. Internal consistency was acceptable with α = .83 for WIF and α = .74 for FIW.

Work exhaustion. A 5-item scale was used to measure work exhaustion (Moore, 2000) (see Appendix).[6] An example item is e.g. "I feel emotionally drained from my work". Items were measured on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).[7] The scores were averaged to form an overall score. Internal consistency was excellent with α = .92.

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[5] Other occupational roles were not statistically analyzed due to the small number of cases in each category.

[6] The items and scale were translated into Swedish by the author. Another person with fluency in English and Swedish made a translation check.

[7] Moore (2000) used a scaling from 0 (never) to 6 (daily). The scaling used in this study has been used by others, e.g. by Golden (2012) in a similar study on teleworking.

Boundary management (boundary permeability). Items originated from the Work-life indicator scale developed by Kossek et al (2012).[8] In sum, 9 items were selected from the permeability dimension of the scale. These items measure to what extent a person allows work to interrupt non-work behavior and the opposite. If more cross boundary interruptions are allowed, then the person has more permeable boundaries between work and non-work. Conversely, if little interruption is allowed, then the person has less permeable boundaries.

The chosen items constitute two separate scales that focus on the direction of the permeability. This has often been overlooked in previous studies (Kossek et al, 2012). The direction is nevertheless important since an employee might have permeability in one direction (e.g. respond to family calls while at work) but not in the other (e.g. not accept work calls while at home). Of the selected items, 5 measured work to non-work interruption and 4 interruptions in the opposite direction. The two 5-point Likert scales ranged from 1 (strongly disagree) to 5 (strongly agree). Internal consistency was acceptable with $\alpha = .78$ for work to non-work interruption and $\alpha = .79$ for non-work to work interruption.

Extent of teleworking. In order to assess extent of teleworking, respondents were given two questions. The first focused on the amount of teleworking from home during regular office hours, and was stated as follows (here translated from the original Swedish version into English): "How many hours do you work from home per week during regular office hours (Mon-Fri, 8 a.m. - 5 p.m.)?". The second question regarded teleworking from home outside regular office hours. The question was: "How many hours do you work from home per week outside the regular office hours, e.g. evenings and weekends?" "Teleworking" was not mentioned specifically in these questions, and the work measured may therefore encompass work that is not technology-aided as well. However, this must be considered unlikely since employees at the company of interest are very dependent on information and telecommunications equipment as a means to carry out their work. Moreover, the headquarters has recently been transformed into an open, activity based office where no private, reserved offices exist. Storing all work-related material digitally is therefore common practice.

Control variables. Age, gender, number of children living at home, marital status, and work hours per week were included as control variables in all analyses. Age was controlled for since employees might be in different career stages and thus experiencing different levels of WFC (Golden et al, 2006) and different levels of exhaustion (Moore, 2000). Gender was controlled for since research has suggested that men and women may experience different levels of WFC (Boswell & Olson-Buchanan, 2007; Carlson et al, 2000; Madsen, 2003). Research has also suggested that women may be more susceptible to the costs of teleworking as a coping strategy (i.e. as a strategy to handle competing demands, stress and so on) (Hartig et al, 2007). Number of children living at home and marital status were included since they have been found to clearly influence levels of conflict (Kreiner, 2006). Finally, the number of work hours per week was controlled for since numerous studies have found that work hours increase WFC (Hill et al, 2010). It was also controlled for to eliminate its potential influence on exhaustion (see e.g., Golden, 2012).

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[8] The items and scale were translated into Swedish by the author. Another person with fluency in English and Swedish made a translation check.

Statistical Analysis

Pearson product-moment correlation coefficients were used in the initial analysis of variables, and hierarchical multiple regression was used for testing the hypotheses.

Regression analysis, as a parametric method, is based on several assumptions that must be met in order to avoid spurious results, e.g. normally distributed variables. Data transformations were used since some variables violated this assumption. More specifically, the variables "exhaustion" and "telework during regular office hours" were transformed using square root data transformations in order to lower the skewness and kurtosis (both exceeding 1.0 for both variables) (Miles & Shevlin, 2007; Tabachnick & Fidell, 2007).[9]

Another assumption that must be met is the absence of multicollinearity. The conclusion was that that there was no violation of this assumption. This was based on the rather low variance inflation factors (VIF) (not above 1.9 in any of the analyses), as well as the absence of extremely high bivariate correlations (Miles & Shevlin, 2007).[10]

Results

Table 1 presents means, standard deviations, and correlations among the variables include in this study.

Three hierarchical regression analyses were performed to test the stated hypotheses. The first two analyses tested hypothesis 1 to 4, while the final one tested hypothesis 5. Demographics variables (age, gender, marital status, number of children living at home) and work hours per week were controlled for in all analyses to avoid spurious results. In the regression on exhaustion, both types of work-family conflict were included. This was done in order to remove these variables potential influence on exhaustion.

Hypothesis 1 stated that extent of teleworking outside regular office hours would be positively related to WIF. However, as can be seen from Table 2 (step 2), no significant relationship could be found between extent of teleworking outside regular office hours and WIF ($\beta = .05$, $p = .77$).

Hypothesis 2 stated that extent of teleworking outside regular office hours would be positively related to FIW. This was not supported ($\beta = .08$, $p = .60$). Furthermore, as can be seen in Table 2 (step 2), extent of teleworking *during* office hours was not related to WIF ($\beta = .25$ $p > .05$) or FIW ($\beta = -.03$ $p = .83$) either.[11] However, as indicated by the low *p*-value, there was a tendency towards a significant relationship between extent of telework during office hours and WIF. This makes the result less clear.

Hypothesis 3 stated that a higher work to non-work permeability would be related to higher levels of WIF. This hypothesis was supported (Table 2, step 3). Non-work permeability was related to higher levels of WIF ($\beta = .27$, $p < .05$). Interestingly, non-work to work permeability was related to lower levels of WIF ($\beta = -.45$, $p < .005$). Put differently, having permeable boundaries seems to have beneficial impact on WIF, but only if it is allowing non-work to interrupt work.

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[9] The transformed variables were not used in the correlation analyses.

[10] There were no bivariate correlations above .70.

[11] Exchanging the telework variables previously used with the aggregated variable "total extent of teleworking", gave similar results both with WIF ($\beta = .26$, $p = .06$) and FIW ($\beta = .02$, $p = .87$). As with, "telework during office hours", there was a tendency towards a significant relationship with WIF though, making the result less clear.

Table 1

Descriptive statistics and correlations[12]

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	43.03	6.20	----														
2. Gender	1.65	0.48	-.11	----													
3. Marital status	1.14	0.35	-.19	-.04	----												
4. Children living at home	1.77	1.04	.22	.21	-.42**	----											
5. Hours worked per week	48.71	5.78	.10	-.06	-.10	.06	----										
6. Tenure	8.89	5.56	.24*	.15	-.07	.06	.16	----									
7. Occupation	1.38	0.49	-.01	-.12	-.11	-.11	.13	.18	----								
8. Work interference with family (WIF)	2.91	0.96	-.02	.14	.07	-.00	.13	.10	-.02	----							
9. Family interference with work (FIW)	1.49	0.56	-.09	.35**	-.12	-.01	-.04	.01	-.09	.21	----						
10. Exhaustion	2.47	1.32	-.15	.11	.18	-.06	-.10	.04	-.27*	.66***	.31**	----					
11. Extent of teleworking during office hours	9.60	5.64	.07	.22	.18	.19	-.02	.04	-.14	.19	.05	.26*	----				
12. Extent of teleworking outside office hours	9.37	4.37	.14	-.05	-.17	.22	.62***	.22	.22	.16	.00	-.02	.03	----			
13. Total extent of teleworking	18.97	7.22	.14	.15	.04	.28*	.36**	.17	.02	.25*	.04	.19	.80***	.63***	----		
14. Boundary permeability (work to non-work)	3.65	0.88	.09	-.17	-.18	.14	.17	-.08	-.19	.14	.00	.09	-.01	.32**	.19	----	
15. Boundary permeability (non-work to work)	3.35	0.85	-.14	.02	-.22	.15	-.26*	-.18	-.12	-.32**	.24*	-.19	.16	-.17	.03	.21	----

Note. $n = 71$, but $n = 69$ for the 1st variable and 70 for 4th variable. Gender: female = 1, male = 2. Occupation: 1 = salesman, 2 = other. Marital status: 1 = married or cohabitant, 2 = other. Tenure is in years at the company. WIF/FIW: 1 = lowest, 7 = highest. Boundary permeability: 1 = lowest, 5 = highest. Exhaustion: 1 = lowest, 5 = highest. Extent of teleworking is in hours per week.
* $p < .05$. ** $p < .01$. *** $p < .001$. (Two-tailed.)

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[12] According to Cohen (1988) a correlation between .30 and .49 should be interpreted as being of medium strength.

Table 2

Hierarchical regression analyses – with work interference with family (WIF) and family interference with work (FIW) as dependent variables

	WIF	FIW
Step 1		
Age	-.12	.00
Gender	.12	.39**
Marital status	-.05	-.11
Children living at home	-.04	-.19
Hours worked per week	-.05	.01
R^2	.05	.16
Adjusted R^2	-.03	.09
Step 2		
Extent of teleworking during regular office hours	.25	-.03
Extent of teleworking outside regular office hours	.05	.08
R^2 change	.03	.01
Adjusted R^2	-.03	.06
Step 3		
Boundary permeability (work interrupting non-work)	.27*	-.01
Boundary permeability (non-work interrupting work)	-.45**	.26
R^2	.24*	.21
R^2 change	.16**	.05
Adjusted R^2	.13*	.09
Final F	2.10*	1.75

Note. $n = 71$, but $n = 69$ for "age" and "children living at home".

Values represent standardized regression coefficients (β) from the final equation.

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

Hypothesis 4 stated that a higher non-work to work permeability would be related to higher levels of FIW. This hypothesis was not supported ($\beta = .26$, $p = .07$) (Table 2, step 3).

When comparing the two analyses in Table 2, some important differences can be seen. In the final model with WIF as dependent variable, 24 % of the variance was explained, *R* square = .24, $p < .05$. (Adjusted *R* square = .13, $p < .05$.) Among the included variables, boundary permeability (work to non-work and vice versa) were the only variables that made significant contributions to WIF, *R* square change = .16, $p < .01$. The final model with FIW as dependent variable was not significant. In fact, the only variable that was significant in this model was gender, $\beta = .39$, $p < .01$. More precisely, it seems like male employees experience higher levels of FIW than their female colleagues.

Hypothesis 5 stated that extent of telework outside regular office hours would be positively related to exhaustion. This hypothesis was not supported. As can be seen in Table 3 (step 3), no significant relationship between extent of teleworking outside the regular office hours and exhaustion could be found ($\beta = -.03$, $p = .81$). Telework during office hours was not related to exhaustion either ($\beta = .17$, $p = .08$). Together, the two telework variables could only explain 2 % of the variance in exhaustion when the influence of the other variables were removed, *R* square change = .02, *F* change (2, 59) = 1.59, $p = .21$. The final model was nevertheless significant and could explain as much as 55 % of

the variance in exhaustion, R square = .55, $p < .001$. (Adjusted R square = .48, $p < .001$.) This was almost entirely due to the inclusion of WIF and FIW.

Table 3

Hierarchical regression analysis – with exhaustion as dependent variable

	Exhaustion
Step 1	
Age	-.09
Gender	-.11
Marital status	.06
Children living at home	.02
Hours worked per week	-.13
R^2	.04
Adjusted R^2	-.03
Step 2	
WIF	.61***
FIW	.24*
R^2 change	.48***
Adjusted R^2	.47***
Step 3	
Extent of teleworking during regular office hours	.17
Extent of teleworking outside regular office hours	-.03
R^2	.55***
R^2 change	.02
Adjusted R^2	.48***
Final F	7.96***

Note. $n = 71$, but $n = 69$ for "age" and 70 for "children living at home".
Values represent standardized regression coefficients (β) from the final equation.
* $p < .05$. ** $p < .01$. *** $p < .001$

Discussion

As mentioned, there is currently little understanding of how teleworking outside regular office hours relates to work-life outcomes (see Boswell & Olson-Buchanan, 2007). Little is also known about how individual differences in boundary management relate to important work-life outcomes (Bulger et al, 2007; Kossek et al, 2006). This study addressed both these gaps in research. First, by examining how extent of telework outside the regular office hours is related to both types of WFC (i.e. WIF and FIW) and exhaustion. Secondly, by examining how boundary management (or more precisely differences in boundary permeability) is related to WIF and FIW.

Results from regression analyses showed no significant relationship between extent of teleworking after hours and WIF, FIW, or exhaustion. In other words, teleworking outside the regular office hours does not seem to be problematic in terms of these work-life outcomes. Regarding boundary management, a significant relationship was found between work to non-work permeability and WIF. However, permeability in

the opposite direction was actually related to less WIF. That is, allowing non-work (e.g. family obligations) to interrupt work is beneficial in terms of WIF. These and other findings will now be discussed more in-depth.

Hypothesis 1 and 2 stated that the extent of teleworking after hours would be related to higher levels of WIF and FIW. These hypotheses were not supported. This is generally contrary to prior studies. For instance, Fenner and Renn (2010), Boswell and Olson-Buchanan (2007), and Duxbury et al (1992) all reported that this form of work was linked to an increase in WIF. Why findings are different from this study is difficult to pinpoint, but there are several possible explanations. For instance, Fenner and Renn (2010) did not focus specifically on the extent of telework as in this study. They used a Likert scale to measure "technology aided supplemental work from home". Boswell and Olson-Buchanan (2007) focused on "traditional" office employees and not teleworkers as in this study. This was also the case with Duxbury et al (1992), who focused on people with the opportunity to conduct teleworking after hours (but supposedly not during regular office hours). Other important differences also exist, e.g. differences in national culture.

Why were there no significant relationships? As mentioned, there are both potential costs and benefits with teleworking after regular office hours (e.g., Duxbury, 1992, 1996). The positive and negative effects may consequently have generated a zero-sum result. It may also be that the employees in this study have skills in goal setting and prioritizing and thereby effectively manage their time. Such skills have been proven to dampen the negative effect of this form of work on WIF (see Fenner & Renn, 2010). Moreover, research has shown that job control is beneficial in terms of work-family conflict (e.g., Kossek et al, 2006). It is thus possible that employees at the investigated company feel they are in control over their work situation (in contrast to being forced by workload and pressures from the employer). Whether it is the case is uncertain though, e.g. since job control and workload were not focused upon in the study.

Hypothesis 3 stated that a higher work to non-work permeability would be related to higher levels of WIF. This hypothesis was supported. In other words, allowing work to interrupt non-work behavior is generally problematic in terms of WIF. Prior research on the relationship between WIF and this form of permeability has reached the same conclusion (see e.g., Bulger et al, 2007; Kossek et al, 2012; Olson-Buchanan & Boswell, 2006). It also in line with previous research claiming that higher boundary integration is related to higher WIF (e.g., Kossek et al, 2006).

As mentioned, there are several potential costs with having weaker, more permeable boundaries and to integrate work and family domains. For instance, there is a risk of boundary blurring/blending, which may create confusion which role to enact and thus exacerbate role-conflict (Ashforth et al, 2000; Clark, 2000). Having work to non-work permeability may also generate more unwanted interruptions from work while in a family/life role. This may make it difficult to psychologically disengage the work role in favor of a family/life role. These are two plausible explanations to why a higher degree of work to non-work permeability would be related to higher WIF. Another possible explanation concerns control. One should bear in mind that boundaries and how they are acted upon are influenced by situational and environmental factors (e.g., Ashforth et al, 2000; Clark, 2000; Desrochers et al, 2005). The organizational setting and the home environment may for instance strongly influence the creation, maintenance, and crossing of role boundaries (Ashforth et al, 2000; Clark, 2000). This can generate problems for employees. In fact, there can be a mismatch between the degree of segmentation (and thus permeability) "supplied" by the employer/workplace

and the segmentation sought by the individual (Kreiner, 2006; Rothbard, Phillips, & Dumas, 2005). An example would be employees who are expected, implicitly or explicitly, to accept work calls even during non-work time, although they do not prefer or like it. In sum, the individual's control over the permeability can consequently be quite limited, leading to higher non-work permeability than is actually preferred and thus higher WIF. Judging from the results, this could very well be the case at the studied company.

Hypothesis 4 stated that allowing non-work to interrupt work behavior would be related to higher levels of FIW. This hypothesis was not supported. In effect, turning attention to family issues when working does not seem to increase family interference with work (FIW). This was a bit surprising. Mainly since the direction of the interruption coincides with the direction of the interference (as with work to non-work permeability and WIF). It also contradicts some recent findings (Bulger et al, 2007; Kossek et al, 2012; cf., Kossek et al, 2006). A tendency ($p = .07$) for the stated relationship was found though, making the result less clear.

Interestingly, the results showed that permeability in this direction (i.e. non-work to work) was related to less WIF. It has been argued that it is important to focus on the direction of the permeability (Kossek et al, 2012), and this finding clearly supports this notion. No prediction was made for this relationship but it nevertheless makes conceptual sense (see Olson-Buchanan and Boswell, 2006). By dealing with family interruptions while working, one's effort is redirected from work to family issues, which arguably should lower work interference with family (WIF). Moreover, interruptions are not always perceived as something negative (Clark, 2000). They can be seen as positive reminders of one's role in another domain, e.g. a parental role. Non-work interruptions could arguably also be perceived as a long-awaited work breaks or change in activity. Judging from the results, this seems to be the case with non-work to work interruptions.

In sum, having more permeable boundaries that allow work interruptions relate to higher WIF. Such permeability is therefore generally not beneficial. Permeability in the opposite direction (i.e. allowance of family interruptions) was related to less WIF – but it could possibly lead to higher FIW. Whether this form of permeability is beneficial for overall work-family conflict is therefore more difficult to determine based on the findings in this study.

Hypothesis 5 stated that the extent of teleworking after hours would be related to higher levels of exhaustion. This hypothesis was not supported. An explanation may be that this form of work is largely voluntary for employees at the company, making it less stressful. It may also be that the work is generally less demanding and consequently less stressful. According to conservation of resources theory (Hobfoll, 1989), less stressful work would mean that resources (such as time and energy) used to bolster against future losses are not drained as extensively. Moreover, since this form of telework was unrelated to WFC as well, there is no increase in role conflict either that may worsen recovery of resources and contribute to an increase in exhaustion.

Lastly, the results also showed that men tended to have higher levels of FIW than women. Male employees perceived the family to interfere more with their work than their female colleagues. The finding and its magnitude were a bit surprising given the small sample size. That men, rather than women, would have higher FIW was not surprising though as previous research has generated mixed conclusions on the relationship between gender and WFC (Carlson, 2000; Madsen, 2003).

Practical implications. The findings from this study suggest that teleworking after regular office hours is not as problematic as has been argued in previous telework research. This is based on the finding that employees teleworking more after regular office hours (e.g. evenings and weekends) do not have higher work-family conflict or exhaustion. Moreover, extent of teleworking during office hours was not related to higher work-family conflict or exhaustion either. That is, teleworking both during and after regular office hours does not seem to be problematic in terms of these work-life outcomes. Yet, regarding telework during office hours, there was a tendency towards a significant relationship with work interference with family (WIF) and exhaustion. In other words, that telework during office hours does not increase these work-life outcomes must be interpreted cautiously. Especially since the sample size was small.

The study has also shown that employees that deal with work issues to a greater extent while not working tend to have higher work interference with family (WIF). As this finding suggests, employees should benefit from enacting boundaries between work and non-work that protect specifically from work encroachments. For instance, working at one's vacation, bringing work materials to family activities, allowing work to interrupt while with friends or family is generally not recommended if to create less interference from work. It is important to remember though that this finding is not applicable to *all* employees. How boundaries are handled is dependent on the individual (e.g., Bulger et al, 2007), and in terms of work-family conflict, some may actually benefit from having permeable boundaries between work and non-work. Furthermore, since the permeability the individual has may be affected by factors such as the organizational climate, company policies, etc. (e.g., Ashforth et al, 2000: Clark, 2000; Nippert-Eng, 1996), it is important that decision makers reflect over what is signaled, wittingly or unwittingly, to employees. Employees might in fact have little control over their boundaries as a result of factors dependent on the company. For instance, simply supplying communication devices to employees have been shown to create expectations among employees to be continuously available (Adkins & Premaux, 2014), i.e. having a more permeable boundary that allows work interruptions.

Finally, this study has also shown that employees that deal with family issues to a greater extent while working do not have higher family interference with work (FIW). In fact, they experienced lower work interference with family (WIF). However, there was a tendency suggesting that this form of permeability could possibly increase FIW. Whether it is beneficial to have less permeable boundaries that allow family/life issues to interrupt work is therefore less clear. This makes practical implications uncertain. It is also uncertain if these findings, as well as others presented in this study, can be generalized to other organizations and contexts.

Directions for future research. This study has shown that telework after hours is not related to higher WFC, challenging the limited research that has been conducted on this very specific form of telework (see e.g., Boswell & Olson-Buchanan, 2007; Duxbury et al, 1992, 1996; Fenner & Renn, 2010). However, this study was conducted on a specific population and it is uncertain to what extent these results can be generalized. More studies, ideally using a much larger sample, are thus needed to see if these findings are valid also for other types of employees and organizations. It is motivated given the limited knowledge that exists of how the use of technology to conduct work after hours is related to work-life outcomes (Boswell & Olson-Buchanan, 2007). It is also motivated since research has tended to overlook the timing of telework

(Golden, 2012), and since studies on WFC and telework more generally have reported equivocal findings (e.g., Golden et al, 2006).

The study has also shown that telework after hours does not relate to a higher exhaustion. Future studies should investigate if this finding is valid for other employees and contexts as well. Since the literature is only just beginning to consider teleworking and its potential impact on exhaustion (Golden, 2012; Sardeshmukh et al, 2012), researchers should be encouraged to do so.

Perceptions of being in control over one's work situation have been found to have a beneficial effect on work-family conflict (Kossek et al, 2006). It is thus possible that higher levels of job control could explain the absence of a relationship with WFC, but also exhaustion. To the degree that this is true for employees at the studied company is unknown since perceptions of job control were not studied. Future research could possibly avoid this problem by studying level of control for this specific form of telework. Related, examining employees' motivations for engaging in this form of work (such as workload and perceived expectations from the employer) may also provide further explanations of how it relates to outcomes such as work-family conflict and exhaustion. This is also warranted by the current lack of knowledge on motivations for this form of telework (see Fenner & Renn, 2010).

This study has also shown that having permeable boundaries that allow work to interrupt non-work is problematic in terms of WIF. This is generally in line with previous research (see e.g., Bulger et al, 2007; Kossek et al, 2012; Olson-Buchanan & Boswell, 2006). However, as could be seen in this study, boundary management is complex and not easily understood. Using an approach with more variables specified in the following thus seems highly beneficial. In this study boundary permeability was focused upon to understand how individuals manage their work-non-work boundaries. Yet, there are also other relevant variables that may explain how boundaries are managed, e.g. control (Kossek et al 2012). Lack of control could explain why more permeable boundaries relate to higher levels of WIF in this study (see Kossek et al, 2006). Yet, as level of boundary control was not studied, this becomes mere speculation. Future studies might therefore want to include boundary control as a variable in studies on boundary management and work-life outcomes. Moreover, cluster analysis may be beneficial in order to more fully capture, and categorize the individual differences that exist (see e.g., Bulger et al, 2007; Kossek et al, 2012). Using this technique of course requires a larger sample than in this study.

Lastly, all of the empirical studies referred to in this study, both on boundary management and teleworking after hours, were cross-sectional. Hence, the research within these fields should benefit from longitudinal studies that can state direction and determine causality.

Limitations. Several limitations exist in this study. To begin with, the study was cross-sectional and causality can therefore not be inferred. It is e.g. not possible to say that a higher degree of work to non-work permeability actually *causes* an increase in WIF. The sample was also small, restricting the validity and reliability of the analysis. The use of self-reports may also raise questions about honesty and accuracy. For instance, employees tend to overestimate work hours if not using a time diary (Hill et al., 2010; cf., Hill et al., 2003). (The mean extent of teleworking, during and outside office hours, as well as work hours per week is thus likely lower than what is reported in this study.) Furthermore, common method variance (CMV) could be a problem since

the independent variable(s) and the dependent variable(s) were measured at the same time using the same method on the same respondents. This means that there is a chance that the measurement method itself has influenced the variance in the dependent variable (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). CMV can inflate or deflate observed relationships between variables and by doing so generate spurious results. There are some arguments why CMV should be less of a concern in this study though. For instance, WIF and FIW were measured with five point Likert scales, while measurement of hours of telework were measured by asking the respondent to type in an exact number. According to Podsakoff et al. (2003) such a design could lower biases stemming from commonalities between scales and anchor effects (i.e. a tendency to rely too heavily on the first piece of information presented when making statements and decisions).

Last but not least, only employees from the company of interest participated in the study. They do not reflect the general working population in many regards. For instance, they likely have higher education and salaries. They also have access to sophisticated communications technologies in their daily routines and tasks. Noteworthy is also that the company in this study has received prestigious prizes for offering a high quality work place. All in all, this makes generalization of findings to other companies and organizations uncertain.

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Appendix: Survey items

Work interference with family (WIF) $\alpha = .83$

(1= Strongly disagree, 5 = Strongly agree)

1. After work, I come home too tired to do some of the things I'd like to do.

2. On the job I have so much work to do that it takes away from my personal interests.

3. My family/friends dislike how often I am preoccupied with my work while I am at home.

4. My work takes up time that I'd like to spend with family/friends.

Family interference with work (FIW) $\alpha = .74$

(1= Strongly disagree, 5 = Strongly agree)

1. I'm often too tired at work because of the things I have to do at home.

2. My personal demands are so great that it takes away from my work.

3. My superiors and peers dislike how often I am preoccupied with my personal life while at work.

4. My personal life takes up time that I'd like to spend at work.

Exhaustion $\alpha = .92$

(1= Strongly disagree, 7 = Strongly agree)

1. I feel emotionally drained from my work.

2. I feel used up at the end of the workday.

3. I feel fatigued when I get up in the morning and have to face another day on the job.

4. I feel burned out from my work.

5. Working all day is really a strain for me.

Boundary management $\alpha = .79$
(Non-work to work permeability)

(1= Strongly disagree, 5 = Strongly agree)

1. I take care of personal or family needs during work.

2. I respond to personal communications (e.g., emails, texts, and phone calls) during work.

3. I do not think about my family, friends, or personal interests while working so I can focus. (Reverse scored)

4. When I work from home, I handle personal or family responsibilities during work.

5. I monitor personal-related communications (e.g., emails, texts, and phone calls) when I am working.

Boundary management $\alpha = .78$
(Work to non-work permeability)

(1= Strongly disagree, 5 = Strongly agree)

1. I respond to work-related communications (e.g., emails, texts, and phone calls) during my personal time away from work.

2. I work during my vacations.

3. I allow work to interrupt me when I spend time with my family or friends.

4. I usually bring work materials with me when I attend personal or family activities.