

# **Blurred Boundaries Regarding Work-Related Smartphone use in Non-Work Hours: Implications for Job Stress.**

Master Thesis by Sharon Steenvoorden (384217). July 31st, 2018

Department of Psychology, Education & Child Studies

Erasmus School of Social and Behavioral Sciences.

Supervisor: dr. D.A.J.A. Derks.

Second Supervisor: prof.dr. A.B. Bakker.

## **Abstract**

*This diary study examined the relationship between daily boundary management (BM) enactment, daily work-related smartphone use in non-work hours and daily job stress, within a global IT-organization. In addition, moderating variables boundary control (BC) and boundary management (BM) preference were also included. A total of 96 employees, all in the possession of a smartphone for work-purposes, completed a diary questionnaire on 4 successive working days (N = 384 data points). The results of multi-level analyses indicated that there is a significant negative relationship between BM enactment and smartphone use. Integrators use their smartphone more often for work-related activities in non-work hours. Additionally, the positive relationship between daily smartphone use and daily job stress was moderated by BM preference and BC. This relationship was more prominent for individuals who experience low (vs. high) BC, as well as for individuals high (vs. low) on segmentation preference. Practical and theoretical implications based on these findings are discussed.*

Rapid development in the field of information and communications technology (ICT), especially the increase in work-related smartphone use, has caused many changes in working life (Cole, 2016; Mellner, 2016). A number of these changes make working life easier and are considered positive. For instance, work-related smartphones provide more flexibility in work hours and at work locations (Derks, Bakker, Peters, & van Wingerden, 2016), resulting in more autonomy for employees. Work-related smartphone use refers to the utilization of a smartphone for work-related purposes, e.g. answering emails, calendar management, or working on presentations during non-work hours (Derks & Bakker, 2014). Employees with more autonomy experience more control over their boundaries—i.e., boundary control—which gives them the opportunity to extend their work life to their home domain. As a result, they can perform their work independent of space and time (Derks et al., 2016; Mellner, 2016). Additionally, work-related smartphone use facilitates communication with both customers and co-workers, which contributes to higher productivity (Mellner, 2016).

However, these positive changes also have negative implications for some individuals, namely; increased availability expectations and blurring of boundaries between work and home domains (Derks et al., 2016; Mellner, 2016). Work-related smartphone use is associated with an “always available”, “always on” mentality which results in pressure to respond immediately to work-related messages regardless of office hours (Park, Fritz, & Jex, 2011; Derks, van Mierlo, & Schmitz, 2014). Consequently, employees exhibit work-related smartphone behaviours, such as carrying the device around perpetually to check for messages and responding to work-related emails in the evening (Derks et al., 2016). When an employee is unable to keep their work and home domain separated or when an employee deliberately does not set clear boundaries, this is referred to as “blurred boundaries”. These blurred boundaries make it harder for employees to mentally detach from work, which can be a predictor of stress (Sonnentag, 2012). However, research shows that not all employees experience negative consequences from blurred boundaries. On the contrary, some even seem to thrive under these circumstances (Kreiner, 2006; Kreiner, Hollensbe, & Sheep, 2009). Boundary theory might help understand the reciprocity between work and non-work domains (Nippert-Eng, 1996).

Taken together, the increase in work-related smartphone use indicates a considerable shift in maintaining work and home boundaries. Research shows that autonomy about how you can set your own limits with regards to where and when you work, might have a moderating effect on the relationship between work-related smartphone use in non-work hours and the amount of stress an employee experiences (Mellner, 2016).

This topic is very relevant for research, as there is still a constant influx of new smartphone users and this trend is not expected to change in the coming years (Mellner, 2016). We assume that using a smartphone for work purposes in non-work hours is normal, although we cannot estimate how it really impacts and affects our lives. The present study aims to expand previous research by including two variables – daily boundary management (BM) enactment and job stress – that have not yet been investigated in this context. We argue that an individual's daily BM enactment is an informative variable, because it gives real information about the behavior of employees, compared to BM preference. Individuals have a general intention (preference) to segment or to integrate, but this does not predicate that their behavior is in line with or matches their preference on a daily basis. Although the relationship between BM preference and work-related smartphone use has been studied before (Park et al., 2011; Derks et al., 2016), up until now, BM enactment on a daily basis has hardly been included in this research area.

The second potential contribution of this study is including job stress – meaning stress processes occurring in conjunction with work (Beehr & Newman, 1978) – as an outcome variable of work-related smartphone use in non-work hours. Many scholars make the assumption that work-related smartphone use in the home domain might be stressful but, as of yet, empirical evidence is lacking (Kossek, Lautsch, & Eaton, 2006; Derks et al., 2014). Job stress can have many negative health consequences (e.g., high blood pressure and an impaired immune system), which also affects organizations (e.g., turnover, burnout, and impaired performance) (Schuler 1980; Ganster & Schaubroeck, 1991). Job stress also has a social impact, as the costs for both the organization and the individual can be high (Schuler, 1980). We decided to measure job stress as a daily variable, because we want to see if the stress level is higher on days where employees use their smartphone more. Therefore, we propose that it is highly important to examine this variable.

To examine the effects of daily BM enactment on job stress, a diary study was conducted. This study examines the relationship between daily BM enactment, daily work-related smartphone use in non-work hours, and daily job stress. We expect the relationship between work-related smartphone use in non-work hours and job stress to be moderated by BM preference and boundary control. Figure 1 shows the theoretical research model.

[Insert Figure 1]

### **Boundary theory**

As mentioned before, research shows that not all employees experience negative consequences from blurred boundaries. On the contrary, some even seem to thrive under these circumstances (Kreiner, 2006; Kreiner et al., 2009). Boundary theory can help understand the interaction between work and non-work domains (Nippert-Eng, 1996). The theory states that individuals create and maintain psychological boundaries between work and home domains (Park et al., 2011; Daniel & Sonnentag, 2016). According to theory, these boundaries have two characteristics, namely: *flexibility*, or physical boundaries and *permeability*, or psychological boundaries (Daniel & Sonnentag, 2016).

Flexibility is the degree to which the spatial and temporal boundaries are supple (Ashfort, Kreiner, & Fugate, 2000; Mellner, 2016). When boundaries can be expanded to a greater degree, flexibility is high. Consequently, a role can be enacted in different settings and at different times. However, when boundaries are very firm, flexibility is low. Role enactment is then limited to a specific setting and timing. For example, if an employee can leave earlier from work to take care of family responsibilities, flexibility is considered high. Permeability is the degree to which a role allows one to be physically located in the role's domain, while psychologically involved in another role (Ashfort et al., 2000; Mellner, 2016). Permeability is low when an employee develops impermeable boundaries such that work aspects (e.g. thoughts) are prevented from spilling over into the home domain (Park et al., 2011). On the contrary, when an employee is able to accept personal messages during the work hours, there is high permeability.

In addition to the characteristics of boundaries, there is also an individual's preference on boundary management. Individuals differ in how rigidly they build the mental barriers between their work and home domains (Kreiner, 2006). Where some individuals are willing to integrate their life domains (i.e., integrators), others are more intended to segment work and home domains (i.e., segmenters). Nippert-Eng (1996) refers to these strategies as boundary management (BM) preferences, which is considered an individual difference variable that is relatively stable over time (Park et al., 2011; Daniel & Sonnentag, 2016). An individual's segmentation preference, which refers to a predisposition to separate aspects of work and home from each other, is achieved through impermeable and inflexible boundaries around the work and home domains (Park et al., 2011; Mellner, 2016). In practice this implies that few interruptions are allowed across the work and home domains, which decreases the probability of spillover from one domain to the other (Park et al., 2011). Integrators, on the contrary, prefer to integrate aspects of work and home with each other which is achieved through permeable

and flexible boundaries or no boundaries at all. This automatically implies that there is interruption and role switching across domains, which increases the probability of work continuing into the home domain (Ashfort et al., 2000). This preference for either integration or segmentation of domains is considered a rather stable trait, which can even be seen as a part of your personality (Rothbard, Philips, & Dumas, 2005; Michel & Clark, 2013).

### **The relationship between daily boundary management enactment and work-related smartphone use in non-work hours**

The BM preference an individual has is relatively stable over time (Kreiner et al., 2009; Daniel & Sonnentag, 2016). On the other hand, the daily enactment of this BM preference can have fluctuations and is short-lived (Derks et al., 2016). Boundary management (BM) enactment refers to the way an individual's boundary management strategy is executed in daily practice (Derks et al., 2016; Peters, Blomme, Derks, & van Heertum, 2018). BM enactment aimed at integration can refer to talking about work, working on your laptop, thinking about work and ruminating. However, BM enactment aimed at segmentation refers to not allowing the above mentioned activities in the home domain. Research shows that in an ideal situation, the enacted BM strategy is in line with the preferred BM strategy, although not every mismatch is equally problematic for everyone. This study does not discuss this 'fit' any further and we therefore do not know what the implications are. So, employees have a general intention (preference) to either segment or integrate, but this doesn't automatically imply that they manage to protect their boundaries aligned with their preference on a daily basis. Due to organizational constraints, it is not always possible for an individual to enact the preferred boundary management style, which may consequently have implications for stress (Nippert-Eng, 1996; Mellner, 2016).

We suggest that a daily enactment of segmentation preference (i.e. high on segmentation preference) will lead to less work-related smartphone use in non-work hours, regardless of the preferred BM strategy. Additionally, we suggest that daily enactment of an integration preference (e.g. low on segmentation preference) will lead to more work-related smartphone use. When the employee's daily BM enactment is more focused on segmentation, they will probably engage in less work-related smartphone use in non-work hours, as they prefer to keep the work and home domain separate. On the contrary, on days where the employee's BM enactment is more focused on integration, they will use their smartphone more intensively for work during evening hours, as they prefer to have spillover from the work to the home domain. Based on this, we propose:

***Hypothesis 1:** Daily boundary management enactment focused on segmentation will be negatively related to daily work-related smartphone use in non-work hours.*

### **The relationship between work-related smartphone use in non-work hours and job stress**

In line with earlier research around this topic, we see daily work-related smartphone use in non-work hours as potential boundary crossing behavior on a daily level (Derks et al., 2016). In other words, the BM enactment is more generally involved in how an individual sets up their boundaries on a daily basis and the resultant smartphone use is this behavior exercised on a specific medium.

Research has shown that work-related smartphone use in non-work hours can have negative consequences for wellbeing (Ohly & Latour, 2014; Cole, 2016; Mellner, 2016; Dettmers, 2017). However, the question of why work-related smartphone use during non-work hours is associated with negative implications is raised. There are a number of reasons, including a disturbed work-personal life balance (Derks & Bakker, 2014) and impaired recovery from stress (Taris et al., 2007). As an individual cannot engage in two activities at the same time, engaging in smartphone activities implies that the individual disengages from home activities and does not disengage from work (Jarvenpaa, Lang, & Tuunainen, 2005). In line with this, Derks and Bakker (2014) found that work-related smartphone use in non-work hours is positively related to daily work-home interference (WHI). This implies that the more an individual uses their smartphone for work related purposes at home, the more work-home interference this individual experiences. Since daily WHI is associated with psychological strain, this might indicate that work-related smartphone use in non-work hours has a relationship with the perceived stress an individual experiences (Geurts, Kompier, Roxburgh, & Houtman, 2001). Complementary to this, multiple studies show that an increased work overload due to the use of a work-related smartphone results in greater work-to-life conflict, which is also an indicator of stress (Geurts et al., 2001; Yun, Kettinger, & Lee, 2012).

Thus, using a work-related smartphone in non-work hours is associated with experiencing more stress. This can be followed one step further. Research shows that there are more risks of overworking during non-work hours as this undermines the recovery of stress that has already been incurred (Taris et al., 2007). Due to work-related smartphone use, an individual is working overtime on a daily basis. This is a call on the same psycho-physiological systems that are already activated during the workday, which can potentially generate negative consequences (Geurts & Sonnentag, 2006).

Several scholars have already suggested that smartphone use can be stressful but, at present, empirical evidence remains lacking (Kossek et al., 2006; Derks et al., 2014). We propose that work-related smartphone use in non-work hours is associated with job stress. Individuals may experience work-related smartphone use in non-work hours as a job demand, due to the associated increased expectations and blurring of boundaries (Derks et al., 2016; Mellner, 2016). On these grounds, we propose that there is a positive relationship between work-related smartphone use and job stress, such that more work-related smartphone use will lead to experiencing more job stress.

*Hypothesis 2: Daily work-related smartphone use in non-work hours will be positively related to daily job stress.*

### **Organizational perspective – The moderating role of boundary control**

We include two moderators in our theoretical model, namely: boundary control – representing the organizational perspective – and boundary management preference – representing the employee perspective. Both moderators are explained below.

Boundary control (BC) is a psychological interpretation of perceived control over one's work domain, in a way that an individual feels a sense of flexibility as to where, when and how work is done (Kossek, Ruderman, Braddy & Hannum, 2012; Straub, Beham, & Islam, 2017). In other words, BC is a form of autonomy about how you can set your own limits about where and when you work. Not only do individuals differ in their preferences to either segment or integrate work and home, but workplaces also differ in the degree that they supply the conditions and resources– i.e., segmentation supplies– to enable this (Kreiner, 2006). BC represents the organizational perspective as it refers to the organization's ability to affect how employees divide their time between work and non-work domains of life (Perlow, 1998).

Currently, the trend is that a lot of companies give employees the opportunity to engage in “flexible working”, which often is related to high BC (Straub et al., 2017). When individuals believe they are able to control the timing, frequency, and direction of boundary crossings to match their identities and role demands, they experience high BC (Straub et al., 2017). On the other hand, when individuals believe they are not able to control their boundary crossing, they experience low BC.

Boundary control can be explained by means of the job demands-resources model (Bakker & Demerouti, 2007). This model indicates that stress occurs when the demands of a specific context are greater than the resources of that context (e.g., decision-making freedom).

For this reason, high BC can be seen as a job resource on the organizational level. High BC eases the negative impact of availability expectations and work-related use of smartphones during personal hours (Cole, 2016), indicating that individuals with high BC experience less negative consequences of work-related smartphone use. High BC also allows individuals to manage their working time, by aligning the timing and location of work with their internal preferences (Piczszek, 2017). On the contrary, low BC can function as a lack of job resources. When individuals do not have control over their boundaries, they may not be able to detach in non-work hours (Kossek et al., 2012). Low BC does not allow individuals to align their work hours and location with their internal preferences, with job stress as a potential outcome. We suggest this might indicate that BC is a moderator in the relationship between daily work-related smartphone use in non-work hours and daily job stress, in a way that the relationship is different for employees that experience high (versus low) BC.

A relatively large amount of research has been done to examine the role of BC. According to Kossek et al. (2012) BC is negatively related to psychological distress and turnover. This suggests that the higher an individual's BC, the lower their turnover intention and psychological distress are. Concurrently, findings of Mellner (2016) indicated that BC is an important factor in the relationship between BM preferences, enacted boundary management and work-home interference. Mellner, Aronsson and Kecklund (2014) found that high BC and preference for a segmentation boundary management style is related to a healthy work-life balance.

Taken together, positive outcomes are more likely to occur when an individual feels high BC, because – as an organizational resource – it enables employees to set and manage their own limits (Kossek et al., 2006). We propose that work-related smartphone use in non-work hours leads to job stress, only when an individual feels they have low (or no) BC. When individuals experience they are unable to control their boundary crossing – e.g. being forced to use their work-related smartphone in personal time – this is accompanied by feelings of stress (Straub et al., 2017). Based on this, we propose:

***Hypothesis 3: Boundary control will moderate the positive relation between daily work-related smartphone use in non-work hours and daily job stress, such that the positive relation between work-related smartphone use and job stress will be stronger for individuals who experience low (vs. high) boundary control.***

**Employee perspective – The moderating role of boundary management preference**

The second moderator in our theoretical model is boundary management (BM) preference. As stated earlier, BM preference refers to how strong individuals differ in building barriers between their work and home domains (Kreiner, 2006). There are integrators, who are willing to integrate their life and work domains and there are segmenters, who are more intended to separate work and home domains. This preference is considered an individual difference variable that is relatively stable over time (Michel & Clark, 2013).

Research shows that BM preference has consequences for employee well-being and career development. For example, individuals with a segmentation preference are less likely to accept a job offer in which work is expected to have spillover in the home domain (Park et al., 2011). Another study found that an integration preference is associated with more negative spillover from the work to the home domain (Derks, van Duin, Tims, & Bakker, 2015), which may be associated with stress in the long term.

In light of the changes in working life – through work-related smartphone use – there is an increased interest in the relationship between work-related smartphone use and BM preference. Based on previous research findings (Derks et al., 2016), we expect BM preference to be a moderator on the positive relationship between work-related smartphone use during non-work hours and job stress, in a way that the relationship between work-related smartphone use and job stress will be less strong for employees who are low on segmentation preference (e.g. integration preference). Individuals low on segmentation preference, feel positive about working at home and having spillover from the work to the home domain (Kreiner, 2006). Therefore, we expect that they experience less job stress from work-related smartphone use in comparison to individuals that are high on segmentation preference, as this behavior is in line with the preference of integrators. Based on this, we propose:

***Hypothesis 4:*** *BM preference will moderate the positive relation between daily work-related smartphone use in non-work hours and daily job stress, such that the positive relation between work-related smartphone use and job stress will be stronger for individuals high (vs. low) on segmentation preference.*

## Method

### Participants

In May 2018, a request for participants was distributed within the online environment of a large-scale, global IT-company. The conditions for being included in the study were that participants worked at least 32 hours a week and they had to be in the possession of a work-related smartphone. As the company is a global organization, the main language of communication in the company was English. Therefore, all the communication concerning the study and all the questionnaires were in English. The participants did not receive a reward for participating in the study, hence all the employees participated on a voluntary basis. The participants were approached through multiple channels. Firstly, within the previously mentioned online environment of the company (intranet). Furthermore, some participants were contacted directly by email and others by word of mouth. They were asked to partake in a diary study about smartphone use and wellbeing. When individuals indicated to be interested in participating, their email addresses were collected.

A total of 122 employees was approached. This study focused on daily fluctuations within participants over the days. Therefore, participants who filled in only 1 day of the questionnaire were removed from the dataset. Due to this reason, 26 cases were removed from the dataset in this study. The final sample consisted of 96 individuals, of which 74 participants (77.0%) filled in all four questionnaires on consecutive working days. This led to between 343 and 384 data points on the within-subjects level. This study had 72.9% male participants ( $n = 70$ ) and 22.9% female participants ( $n = 22$ ). The gender of 4 participants (4.2%) was unknown. The average age of the participants was 39.7 years ( $SD = 8.22$ ). Most of the participants in this study had a managerial position (66.7%), while conversely the remainder occupied a non-managerial position (27.1%), or were interns (2.1%). The final 4.2% did not indicate their type of employment. The participants had different countries of origin. Most of the participants, (39), were employed in India (40.6%), 23 operated in the Benelux and the Nordics (24.0%), 7 were working in France (7.3%), 7 were working in North America Operations (7.3%), 2 were working in Central and Eastern Europe (2.0%), 2 were working in Middle East Africa (2.0%), 2 were established in Asia-Pacific (2.0%) and 1 was working in the UK (1.0%). 'Other' was indicated as an answer by 9 participants (9.4%). The remaining 4.2% did not indicate in which country they work.

## Procedure

The diary study consisted of filling in online questionnaires on four consecutive working days. Hence, participants could either start on Monday (until Thursday) or Tuesday (until Friday). The participants received an email at the end of every day with instructions and a link to the questionnaire. In the instructions the respondents were encouraged to fill in the questions at the end of the evening, before they went to bed.

The first questionnaire included demographic variables, as well as trait boundary control and trait boundary management preference. The first questionnaire also included daily measures of boundary management enactment, work-related smartphone use, workload (control variable), and job stress. The three consecutive questionnaires only included the daily measures of boundary management enactment, work-related smartphone use, workload, and job stress. The data was matched through a personal code that the participants constructed on the first day. Participants were asked to create a personal code based on their date of birth and initials. In the following questionnaires, participants were asked to fill in their unique code and they were given a reminder explaining how the code had been created. The code was only used to link the data and to track people over time.

## Measurement

All items were rated on a 7-point Likert scale ranging from 1 = *totally disagree* to 7 = *totally agree*, unless stated otherwise.

*Boundary control* was measured with three items created by Kossek et al., (2012). As this is a trait variable, participants had to fill this in on the first day only to indicate how much general control they perceived over work-nonwork boundaries. Example items are: “I control whether I am able to keep my work and personal life separate,” and “I control whether I combine my work and personal life activities throughout the day”. A higher score indicated a higher level of perceived boundary control. Cronbach’s  $\alpha$  of this scale was .81.

*Boundary management preference* was measured with four items created by Kreiner (2006). As this is a trait variable, participants had to fill this in on the first day only to indicate what their general boundary management preference was. Example items are “I do not like to think about my work while I am at home” and “I do not like it when I integrate work issues with my private life”. A higher score indicated a boundary management preference aimed at segmentation. Cronbach’s  $\alpha$  of this scale was .79.

The following variables were used for daily measurement on multiple occasions. Therefore, the items of trait variables were adjusted so they related to daily experiences:

*Daily boundary management enactment* was measured with five items created by Kossek et al., (2012). In their article it was called ‘work interrupting non-work behaviors’. Participants had to fill this in at the end of the day as an evaluation of the non-work hours that day (evening). Example items are: “Today, I’ve responded to work-related communications (e.g. emails, texts, and phone calls) during my personal time away from work” and “Today, I brought work materials with me when I attended personal life activities throughout the day”. A higher score indicated the enactment of an integration preference. Cronbach’s  $\alpha$  of the scale varied from .85 to .94, with an average of .91 over 4 days.

*Daily work-related smartphone use in non-work hours* was measured with four items created by Derks & Bakker (2014). Participants had to fill this in at the end of the day as an evaluation of the non-work hours that day (evening). Example items are “Today, I was online for work until I went to sleep” and “Today, when my smartphone blinked to indicate new work messages, I could not resist checking them”. A higher score indicated more work-related smartphone use in non-work hours. Cronbach’s  $\alpha$  of the scale varied from .79 to .92, with an average of .87 over the 4 days.

*Daily job stress* was measured with six items created by Yun et al., (2012). Participants had to fill this in at the end of the day as an evaluation of the non-work hours that day (evening). Example items are “Have you felt emotionally drained from your work today?” and “Have you found that you could not cope with all the things you had to do today?” These items were rated on a 7-point Likert scale ranging from 1 = *never* to 7 = *always*. A higher score indicated a higher level of job stress. Cronbach’s  $\alpha$  of the scale varied from .91 to .94, with an average of .92 over the 4 days.

*Daily workload* was measured as a control variable, because it could act as a confounder, due to the fact that it may be related to some variables in the current model. Daily workload was measured with four items created by Yun et al., (2012). Participants had to fill this in at the end of the day as an evaluation of the non-work hours that day (evening). Example items are “Today, I felt that the amount of work I do interferes with how well it is done” and “Today, I felt pressured when working.” A higher score indicated a higher perceived workload. Cronbach’s  $\alpha$  of the scale varied from .80 to .89, with an average of .86 over the 4 days.

## Research Design and Statistical Analyses

The data used in this diary study is multi-level, with repeated measurements nested within individuals. This results in a two-level model with repeated measures (daily variables) at the first level ( $N =$  between 343 and 384 data points) and the individual participants at the second level ( $N = 96$  participants). A conscious choice has been made for this design, as it gives the opportunity to look at the daily fluctuations of boundary management enactment, work-related smartphone use and job stress. We believe it is interesting to look at variables that are stable over time (*trait*) and to examine how these affect daily life (*state*). This multilevel design makes this possible. To test the above mentioned design, a multilevel analysis was used with the MLwiN program (Rashbash, Browne, Healy, Cameron, & Charlton, 2000).

In order to execute the analyses, predictor variables that were measured on a daily level (workload, BM enactment and work-related smartphone use) were centered to the individual mean. Predictor variables measured at the trait level (tenure, age, boundary control, BM preference) were centered around the grand mean. To determine control variables, we examined which variables are theoretically relevant and whether or not these variables are significantly related to the outcome variable of that particular analysis.

## Results

### Descriptive statistics

Table 1 shows the means, standard deviations and correlations of all variables included in this study. To determine the proportion of variance that is attributed to the different levels of analysis, the intraclass correlations (*ICCI*) were calculated for all the variables measured on the day level. Results showed that 19% of the variance of daily boundary management enactment, 23% of the variance of daily work-related smartphone use in non-work hours, 28% of the variance of daily job stress, and 36% of the variance of daily workload was attributable to within-person variations over the four days.

[Insert Table 1]

### Hypothesis Testing

According to Hypothesis 1 daily boundary management (BM) enactment directed at segmentation will be negatively related to daily work-related smartphone use in non-work hours. In order to test the hypothesis, we ran a multilevel model that contained daily BM enactment as the predictor, workload and tenure as control variables and work-related smartphone use as dependent variable. Table 2 shows that the model adding daily BM

enactment as a predictor, explained significantly more variance over the control variables model ( $\Delta-2x \log = 73.29$ ,  $df = 1$ ,  $p < .01$ ). The estimate of daily BM enactment ( $\gamma = .57$ ,  $SE = .06$ ,  $t = 9.30$ ,  $p < .001$ ) was significant. These findings support Hypothesis 1: On days that employees integrate their work and home domains, they use their smartphone more intensively for work related activities in non-work hours.

[Insert Table 2]

According to Hypothesis 2 daily work-related smartphone use in non-work hours will be positively related to daily job stress. To test this hypothesis, we examined two models for daily job stress. The control model that included only the intercept and the control variables (workload, tenure and age), and the predictor model containing daily work-related smartphone use as the predictor of daily job stress, as well as the control variables. The results (see Table 3) show that the predictor model does not explain significantly more variance over the control model ( $\Delta-2x \log = 1.64$ ,  $df = 1$ ,  $p = ns$ ). The estimate of daily work-related smartphone use in non-work hours was not significant ( $\gamma = .07$ ,  $SE = .05$ ,  $t = 1.27$ ,  $p = ns$ ). These findings reject Hypothesis 2.

[Insert Table 3]

According to Hypothesis 3 boundary control will moderate the relationship between daily work-related smartphone use in non-work hours and daily job stress. We expected that employees who perceive a low level of boundary control, would experience a higher level of job stress on days that they use their smartphone more intensively for work than employees who perceive a high level of boundary control. To test this hypothesis, we created a predictor only model, which included both control variables (age, tenure and workload) and predictors (daily smartphone use and boundary control). Besides, we created an interaction model, including the control variables, the predictors and the interaction term of boundary control and daily smartphone use. The results (see Table 4) showed that the interaction model explained significantly more variance over the predictor only model ( $\Delta-2x \log = 18.48$ ,  $df = 6$ ,  $p < .01$ ). Furthermore, boundary control significantly moderated the relationship between daily work-related smartphone use in non-work hours and daily job stress ( $\gamma = .06$ ,  $SE = .01$ ,  $t = 4.36$ ,  $p < .001$ ). Figure 2 shows that employees who perceive a low level of boundary control experience more job stress and that this is not related to their daily work-related smartphone use in non-

work hours. Employees who perceive a high level of boundary control experience a higher level of job stress on days that they use their smartphone more intensively for work-related activities in non-work hours, than on days where they don't use their smartphone as much. These findings reject Hypothesis 3.

[Insert Figure 2]

[Insert Table 4]

According to Hypothesis 4 boundary management (BM) preference will moderate the relationship between daily work-related smartphone use in non-work hours and daily job stress. We expected that employees who prefer to keep their domains segmented (BM preference aimed at segmentation) experience a higher level of job stress on days that they use their smartphone intensively for work compared to employees low in segmentation preference (i.e., integrators). To test this hypothesis, we compared the predictor only model, which includes the control variables (age, tenure and workload) and the predictors (daily smartphone use and BM preference) with the interaction model adding the interaction term of BM preference and daily smartphone use. The results, displayed in Table 5, showed that the interaction model explains significantly more variance over the predictor only model ( $\Delta-2x \log = 16.56$ ,  $df = 6$ ,  $p < .025$ ). Furthermore, BM preference significantly moderated the relationship between daily work-related smartphone use in non-work hours and daily job stress ( $\gamma = .07$ ,  $SE = .02$ ,  $t = 4.53$ ,  $p < .001$ ). Figure 3 shows that employees who aim to segment their work and home domains, experience more stress on days that they use their smartphone more intensively for work in non-work hours. For employees with an integration preference, smartphone use and stress are unrelated. Hypothesis 4 is supported.

[Insert Figure 3]

[Insert Table 5]

### **Additional Analyses**

First, we wondered whether particularly daily smartphone use in combination with daily high workload is positively related to daily job stress. In order to test this assumption, we compared the predictor only model—containing control variables (age and tenure) and predictors (daily smartphone use and workload) with the interaction model adding the interaction term of workload and smartphone use. The results (see Table 6) showed that the

interaction model explains significantly more variance over the predictor only model ( $\Delta-2x \log = 46.31$ ,  $df = 5$ ,  $p < .001$ ). In addition, workload significantly moderated the relationship between work-related smartphone use in non-work hours and job stress ( $\gamma = .08$ ,  $SE = .01$ ,  $t = 8.00$ ,  $p < .001$ ). Figure 4 shows that employees with a low perceived workload experience a low level of job stress, regardless whether they use their smartphone intensively that day or not. However, Figure 4 also shows that employees with a high-perceived workload experience a higher level of job stress on days that they use their smartphone intensively for work-related activities in non-work hours than on days where they don't use their smartphone as much.

[Insert Figure 4]

[Insert Table 6]

In the literature, it is often claimed that integrators experience more stress than segmenters (see for example Mellner, 2016). Therefore, we tested whether this was the case in our sample. We compared the multilevel model containing the control variables—workload, age and tenure—with the predictor model adding daily BM enactment as the predictor of daily job stress. Results (see Table 7) show that the predictor explained significantly more variance over the control model ( $\Delta-2x \log = 7.02$ ,  $df = 1$ ,  $p < .01$ ). The estimate of daily BM enactment ( $\gamma = .15$ ,  $SE = .06$ ,  $t = 2.67$ ,  $p < .01$ ) was significant. These results indicate that employees, who integrate their work and home domains on a daily basis, indeed experience more job stress.

[Insert Table 7]

## Discussion

The current study aimed to shed light on the impact of daily BM enactment on daily work-related smartphone use in non-work hours and daily job stress. In addition, the study examined the influence of trait factors – BM preference and boundary control – on the relationship between daily work-related smartphone use and daily job stress. In short, our findings indicate that integrators use their smartphone more often for work-related activities in non-work hours than segmenters. In addition, employees who experience high (vs. low) boundary control experience more job stress on days they use their smartphone more for work-related activities in non-work hours. The same applies to employees high (vs. low) on segmentation preference, who also experience more job stress on days they use their smartphone more for work-related activities in non-work hours.

### **Main Findings and Contributions**

In line with our expectations, we found that on days where employees integrated their work and home domains (BM enactment aimed at integration), they used their smartphone more intensively for work-related activities in non-work hours. These results are in line with the general assumptions of boundary theory (Nippert-Eng, 1996; Daniel & Sonnentag, 2016). Integrators engage more often in activities such as talking about work, thinking about work and ruminating on a daily basis. Therefore, for integrators, the smartphone facilitates access to work in the home domain. Segmenters, however, are less preoccupied with work outside work hours, on a daily basis. Hence, segmenters experience fewer urges to use their smartphone outside of work hours.

Our study contributes to the literature by extending the insights on boundary theory (Nippert-Eng, 1996). As one of the first articles to include BM enactment in the theoretical model, these findings can serve as a basis for further research. Studies regarding this topic have often focused on BM preference. Yet, little research has been done on the daily enactment of BM preference. Employees have a general intention (preference) to either segment or integrate, but this doesn't automatically imply that they manage to protect their boundaries aligned with their preference on a daily basis. The results from this study emphasize the importance of the daily enactment of boundary management. In addition, previous studies (Derks et al., 2014; Derks et al., 2015) mention not including "overall time dedicated to work at home", besides smartphone use, as a serious limitation. Consequently, employees can engage in work-related activities other than smartphone use, e.g. preparing a presentation or reading literature, while this is not registered in the study results (Derks et al., 2015). With BM enactment in the model, this limitation is reduced. BM enactment aimed at integration can refer to the managing of boundaries, talking about work, working on your laptop, thinking about work, ruminating etc. (Peters et al., 2018). With this variable included, we now know more about other work-behaviours of employees in non-work hours.

In line with earlier studies indicating that positive outcomes are more likely to occur, when an individual experiences high boundary control (e.g. Kossek et al., 2006; Kossek et al., 2012; Mellner, 2016), our results show that boundary control (BC) moderates the relationship between daily work-related smartphone use and daily job stress. Employees who experience low BC experience high levels of job stress, unrelated to their smartphone use, whereas employees who experience high BC have more job stress on days they use their smartphone more for work-related purposes. This result is interesting, yet not in line with our expectation, as this indicates that employees with high levels of BC and extensive use of their smartphone,

experience the same amount of stress as employees with low BC. A more obvious expectation would be that for employees with low levels of BC, job stress increases as they use their smartphones more. For employees with higher levels of BC, you would expect a buffering effect and not – as we found now – that stress is higher on days when they use their smartphones.

However, an alternative explanation for these findings could be the job demands-resources model (Bakker & Demerouti, 2007). Employees who experience low levels of BC feel like they have no control over the timing, frequency and direction of boundary crossings (Straub et al., 2017), and consequently experience stress. So, employees experience low BC as a lack of job resources. On the other hand, employees who experience high levels of BC feel free to set their own boundaries, but when they are forced to overstep these (by feeling pressured to use their smartphone for work activities in personal time), they experience stress. Therefore, employees experience high BC as a job resource, but work-related smartphone use in non-work hours as a job demand. Yet, employees with high BC are the ones who experience more stress on days they use their smartphone more intensively for work-related purposes, compared to days where they use their smartphone less intensively. Apparently, there is something in the use of smartphones itself that makes it stressful. Job resources work as a buffer, because our results indicate that employees who engage less in work-related smartphone use in non-work hours, experience less stress. However, when the job demands increase (smartphone use), the experienced amount of stress will also increase, despite the high BC. So, as an organization, it is important to give employees the feeling of high BC, as our data indicates that low BC is always stressful. However, it is not enough to only focus on BC. Employers also have to discourage work-related smartphone usage in evenings to deal with stress.

Finally, we expected that BM preference moderates the relationship between daily work-related smartphone use in non-work hours and daily job stress. Our data confirms that, for employees who have an integration preference, daily work-related smartphone use in non-work hours is not related to daily job stress. On the contrary, employees with a segmentation preference experience more job stress on days that they use their smartphone more intensively for work-related purposes. These findings are in line with other research regarding this topic (Derks et al., 2016), and offer support for boundary theory (Kreiner, 2006). Employees that have a low segmentation preference (e.g. integrators) feel positive about working in non-work hours and do not mind having spillover from the work to the home domain. That, for this type of workers, work-related smartphone use in non-work hours is not related to job stress, fits this description precisely. Integrators see work-related smartphone use in non-work hours not as negative and therefore their daily job stress is not linked to this (Kreiner, 2006), in fact,

smartphones facilitate their preference. Segmenters, on the other hand, prefer to keep their work and home domains separate. So, when segmenters are forced to use their smartphone for work-activities in non-work hours, this behavior is not in line with their trait preference and therefore they experience more stress on these days.

These findings also indicate the difference between daily BM enactment and trait BM preference. For employees with an integration preference, smartphone use and stress are unrelated. However, employees who enact an integration preference of their work and home domains on a daily basis, experience more job stress.

In contrast with our expectations, daily work-related smartphone use during non-work hours was not directly related to daily stress. There might be two plausible, alternative explanations. First, workload is positively related to job stress, indicating that the higher the workload, the more job stress an employee experiences. Workload explained a lot of variance and is therefore a strong predictor of daily job stress. Workload and smartphone use probably have shared variance. Second, additional analyses showed a direct relationship between daily BM enactment and daily job stress. On days where employees integrate their work and home domains (BM enactment focused on integration), they experience more daily job stress than employees who segment on a daily basis. BM enactment aimed at integration refers to activities such as thinking about work, ruminating about work and using your laptop for work activities (Derks et al., 2016; Peters et al., 2018). These results imply that it goes further than using a smartphone.

Results from our additional analysis show that workload moderates the relationship between daily work-related smartphone use in non-work hours and daily job stress. This implies that employees with a low workload experience a low level of job stress, regardless if they use their smartphone intensively that day or not. However, employees with a high perceived workload experience more job stress on days they use their smartphone more intensively than on days they do not use their smartphone for work-related activities. These findings are in line with other research regarding this topic (Yun et al., 2012). Employees who experience a high workload, should not use their smartphone for work-related activities in non-work hours, as this is more stressful.

### **Strengths, Limitations, and Suggestions for Future Research**

As with any study, the current study has a number of strengths. Firstly, all the employees participating in this study come from one single case organization. Studies regarding smartphone use and boundary theory often use a convenience sample, although that can lead to

the under-representation or over-representation of particular groups within the sample (Kam, Wilking, & Zechmeister, 2007). By using a single organization, the results of the current study are more representative of the population.

Second, we controlled for several variables in this study. For each analysis, we examined which control variables are theoretically relevant and which variables were significantly related to the outcome variable of that particular analysis. Even after controlling for workload, age and tenure, the interaction models explained unique variance over the predictor only models. This means that our results cannot be explained by variables as workload, age and tenure. Both variables – boundary control and BM preference – are significant moderators on the relationship between daily work-related smartphone use in non-work hours and daily job stress. We paid special attention to possible confounding variables, thereby minimizing systematic error. Third, this research has several new features. We added BM enactment and job stress, variables that to our knowledge hardly have been studied in this specific context and we added an organizational perspective moderator and an employee perspective moderator.

Although the strengths of this study promote the relevance of our results, there are limitations that should be taken into account. It should be noted that all study variables were measured at the same time: the end of the day. This automatically implies that predictors and outcome variables were not temporally separated. Otherwise stated, this design is incapable of establishing the temporal order of the variables, which has direct consequences for the causality of our findings (Derks et al., 2016). Therefore, a suggestion for future studies would be to establish the temporal order by collecting the variables on different time points during the day. This ensures that the variables are separated.

In addition, the results are based on self-report measures. Hence, there is a chance that the found variance is attributable to the measurement method, rather than to the constructs the measures represent. This is known as common-method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, as we conducted multilevel regression analyses and focused on intra-individual fluctuations, the chance of common-method variance taking place is reduced.

Besides, the goal of our study was to measure work-related smartphone use in non-work hours. As we did a 4-day diary study, we only included the non-work hours during the week. It would be interesting for future research to test employees in the weekends as well, as these are also considered non-work hours. A 7-day diary study would give more insight on the distribution of work-related smartphone use throughout the whole week.

Finally, we were interested in a group of existing, experienced smartphone users. This

is a selective group and therefore there is a possibility that they are linked to a specific and knowledge based work field (Derks & Bakker, 2014). Furthermore, all participants are working in the IT-sector. Within our sample, 66.7% indicated that they have a managerial position. Also, 95.8% of our sample indicated they went to College/University and are thus highly educated. Therefore, generalizing these results to the general population must be done with caution. A suggestion for future studies would be to include more employees with a lower level of education. It might be interesting to see if there is a difference in work-related smartphone use in low vs. high education.

### **Implications for Practice**

The results from this study have important practical implications. First, employers and employees need to be aware of the importance of workers' needs for undisturbed non-work hours. Our findings implicate that employees who integrate their work and home domains on a daily basis, experience more job stress, than employees who segment. Managers should be aware of the dangers (e.g. more job stress) and relay these on to their employees. In line with Mellner's (2016) arguments, it would be helpful to implement a strategy where employees can choose one or two days in the week where they are available after work hours to deal with work activities. This would leave other evenings free from availability expectations.

Second, managers need to be more aware of the dangers (e.g. more job stress) of an environment marked with low boundary control. The organization should play a fundamental part in increasing boundary control, as well as discouraging work-related smartphone use in non-work hours. For example, by introducing a new policy regarding smartphone use in non-work hours and leisure. This would promote BM enactment focused on segmentation, and consequently improve the level of experienced boundary control.

This study has shown that a 3-point approach is needed to reduce job stress. Managers should focus on creating a work environment marked with high BC, they should discourage work-related smartphone use in non-work hours and they should prevent a high workload, as this is a strong predictor of work-related smartphone use and job stress.

### References

- Ashforth, B. E., Kreiner, G. E., & Fugate, M. (2000). All in a day's work: Boundaries and micro role transitions. *Academy of Management review*, *25*, 472-491.  
<https://doi.org/10.5465/amr.2000.3363315>
- Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of managerial psychology*, *22*, 309-328.  
<https://doi.org/10.1108/02683940710733115>
- Beehr, T. A., & Newman, J. E. (1978). Job stress, employee health, and organizational effectiveness: A facet analysis, model, and literature review. *Personnel psychology*, *31*, 665-699. <https://doi.org/10.1111/j.1744-6570.1978.tb02118.x>
- Cole, G. (2016). Controlling the boundaries: how to minimize the negative impact of working outside regular hours. *Human Resource Management International Digest*, *24*, 15-17. <https://doi.org/10.1108/HRMID-06-2016-0085>
- Daniel, S., & Sonnentag, S. (2016). Crossing the borders: The relationship between boundary management, work–family enrichment and job satisfaction. *The International Journal of Human Resource Management*, *27*, 407-426.  
<https://doi.org/10.1080/09585192.2015.1020826>
- Derks, D., & Bakker, A. B. (2014). Smartphone use, work–home interference, and burnout: A diary study on the role of recovery. *Applied Psychology*, *63*, 411-440.  
<https://doi.org/10.1111/j.1464-0597.2012.00530.x>
- Derks, D., van Mierlo, H., & Schmitz, E. B. (2014). A diary study on work-related smartphone use, psychological detachment and exhaustion: Examining the role of the perceived segmentation norm. *Journal of occupational health psychology*, *19*, 74-84.  
<http://dx.doi.org/10.1037/a0035076>
- Derks, D., Duin, D., Tims, M., & Bakker, A. B. (2015). Smartphone use and work–home interference: The moderating role of social norms and employee work engagement. *Journal of Occupational and Organizational Psychology*, *88*, 155-177.  
<https://doi.org/10.1111/joop.12083>
- Derks, D., Bakker, A. B., Peters, P., & van Wingerden, P. (2016). Work-related smartphone use, work–family conflict and family role performance: The role of segmentation preference. *Human Relations*, *69*, 1045-1068.  
<https://doi.org/10.1177/0018726715601890>
- Dettmers, J. (2017). How extended work availability affects well-being: The mediating roles

- of psychological detachment and work-family-conflict. *Work & Stress*, 31, 24-41.  
<https://doi.org/10.1080/02678373.2017.1298164>
- Ganster, D. C., & Schaubroeck, J. (1991). Work stress and employee health. *Journal of management*, 17, 235-271. <https://doi.org/10.1177/014920639101700202>
- Geurts, S. A., Kompier, M. A., Roxburgh, S., & Houtman, I. L. (2003). Does work-home interference mediate the relationship between workload and well-being?. *Journal of Vocational Behavior*, 63, 532-559. [https://doi.org/10.1016/S0001-8791\(02\)00025-8](https://doi.org/10.1016/S0001-8791(02)00025-8)
- Geurts, S.A.E., & Sonnentag, S. (2006). Recovery as an explanatory mechanism in the relation between acute stress reactions and chronic health impairment. *Scandinavian Journal of Work Environment & Health*, 32, 482-492.
- Jarvenpaa, S. L., Lang, K. R., & Tuunainen, V. K. (2005). Friend or foe? The ambivalent relationship between mobile technology and its users. In *Designing ubiquitous information environments: Socio-technical issues and challenges*, 185, 29-42. [https://doi.org/10.1007/0-387-28918-6\\_5](https://doi.org/10.1007/0-387-28918-6_5)
- Kam, C. D., Wilking, J. R., & Zechmeister, E. J. (2007). Beyond the “narrow database”: Another convenience sample for experimental research. *Political Behavior*, 29, 415-440. <https://doi.org/10.1007/s11109-007-9037-6>
- Kossek, E. E., Lautsch, B. A., & Eaton, S. C. (2006). Telecommuting, control, and boundary management: Correlates of policy use and practice, job control, and work-family effectiveness. *Journal of Vocational Behavior*, 68, 347-367.  
<https://doi.org/10.1016/j.jvb.2005.07.002>
- Kossek, E. E., Ruderman, M. N., Braddy, P. W., & Hannum, K. M. (2012). Work-nonwork boundary management profiles: A person-centered approach. *Journal of Vocational Behavior*, 81, 112-128. <https://doi.org/10.1016/j.jvb.2012.04.003>
- Kreiner, G. E. (2006). Consequences of work-home segmentation or integration: A person-environment fit perspective. *Journal of organizational behavior*, 27, 485-507.  
<https://doi.org/10.1002/job.386>
- Kreiner, G.E., Hollensbe, E.C., & Sheep, M.L. (2009). Balancing borders and bridges: Negotiating the work-home interface via boundary work tactics. *Academy of Management Journal*, 52, 704-730. <https://doi.org/10.5465/amj.2009.43669916>
- Mellner, C., Aronsson, G., & Kecklund, G. (2014). Boundary management preferences, boundary control, and work-life balance among full-time employed professional's in knowledge-intensive, flexible work. *Nordic journal of working life studies*, 4, 7.
- Mellner, C. (2016). After-hours availability expectations, work-related smartphone use during

- leisure, and psychological detachment: The moderating role of boundary control. *International Journal of Workplace Health Management*, 9, 146-164. <https://doi.org/10.1108/IJWHM-07-2015-0050>
- Michel, J. S., & Clark, M. A. (2013). Investigating the relative importance of individual differences on the work–family interface and the moderating role of boundary preference for segmentation. *Stress and Health*, 29, 324-336. <https://doi.org/10.1002/smi.2474>
- Nippert-Eng, C. (1996). Calendars and keys: The classification of “home” and “work”. In *Sociological Forum*, 11, 563-582. Kluwer Academic Publishers-Plenum Publishers.
- Ohly, S., & Latour, A. (2014). Work-related smartphone use and well-being in the evening. *Journal of Personnel Psychology*, 13, 174-183. <https://doi.org/10.1027/1866-5888/a000114>
- Park, Y., Fritz, C., & Jex, S. M. (2011). Relationships between work-home segmentation and psychological detachment from work: the role of communication technology use at home. *Journal of Occupational Health Psychology*, 16, 457. <http://dx.doi.org/10.1037/a0023594>
- Perlow, L. A. (1998). Boundary control: The social ordering of work and family time in a high-tech corporation. *Administrative Science Quarterly*, 43, 328-357. <http://dx.doi.org/94.209.151.175>
- Peters, P., Blomme, R., Derks, D., & van Heertum, A. (2018). Differences in Men and Women’s Responses to Availability Pressures: A Structured Equation Model on the Influence of Perceived Availability Pressures on Employees’ Boundary Control, Enacted Boundary Management Strategy and Work-Home Conflict. *Not published yet.*
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 5, 879-903.
- Rashbash, J., Browne, W., Healy, M., Cameron, B. and Charlton, C. (2000). *MLwiN (version 1.10.006): Interactive software for multilevel analysis*, London, UK: Multilevel Models Project, Institute of Education, University of London.
- Schuler, R. S. (1980). Definition and conceptualization of stress in organizations. *Organizational behavior and human performance*, 25, 184-215. [https://doi.org/10.1016/0030-5073\(80\)90063-X](https://doi.org/10.1016/0030-5073(80)90063-X)
- Sonnentag, S. (2012). Psychological detachment from work during leisure time: The benefits of mentally disengaging from work. *Current Directions in Psychological Science*, 21,

114-118. <https://doi.org/10.1177/0963721411434979>

- Straub, C., Beham, B., & Islam, G. (2017). Crossing boundaries: integrative effects of supervision, gender and boundary control on work engagement and work-to-family positive spillover. *The International Journal of Human Resource Management*, 1-24. <https://doi.org/10.1080/09585192.2017.1340324>
- Taris, T.W., Beckers, D.G.J., Dahlgren, A., Geurts, S.A.E., & Tucker, P. (2007). Overtime work and well-being: Prevalence, conceptualization and effects of working overtime. In S. McIntyre & J. Houdmont (Eds.), *Occupational health psychology: European perspectives on research, education and practice*, 2, 21–40. Maia, Portugal.
- Yun, H., Kettinger, W. J., & Lee, C. C. (2012). A new open door: the smartphone's impact on work-to-life conflict, stress, and resistance. *International Journal of Electronic Commerce*, 16, 121-152. <https://doi.org/10.2753/JEC1086-4415160405>

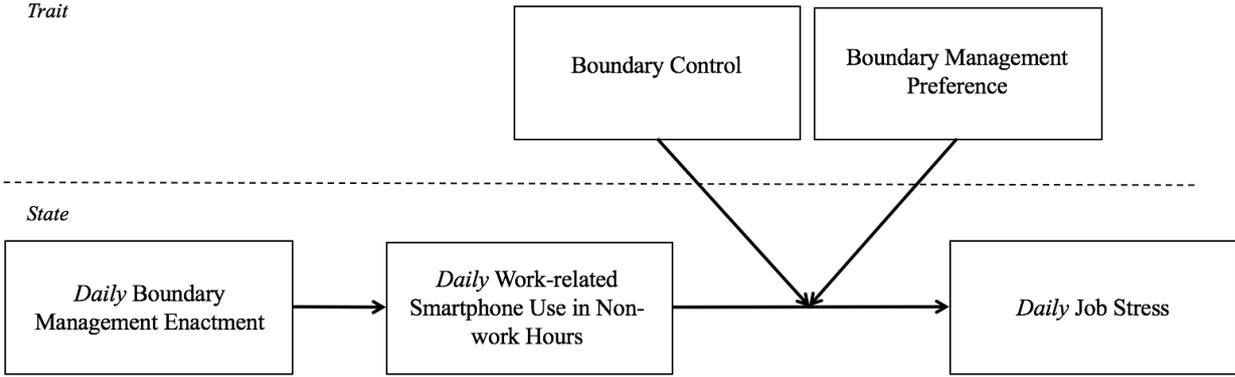


Figure 1. Research model.

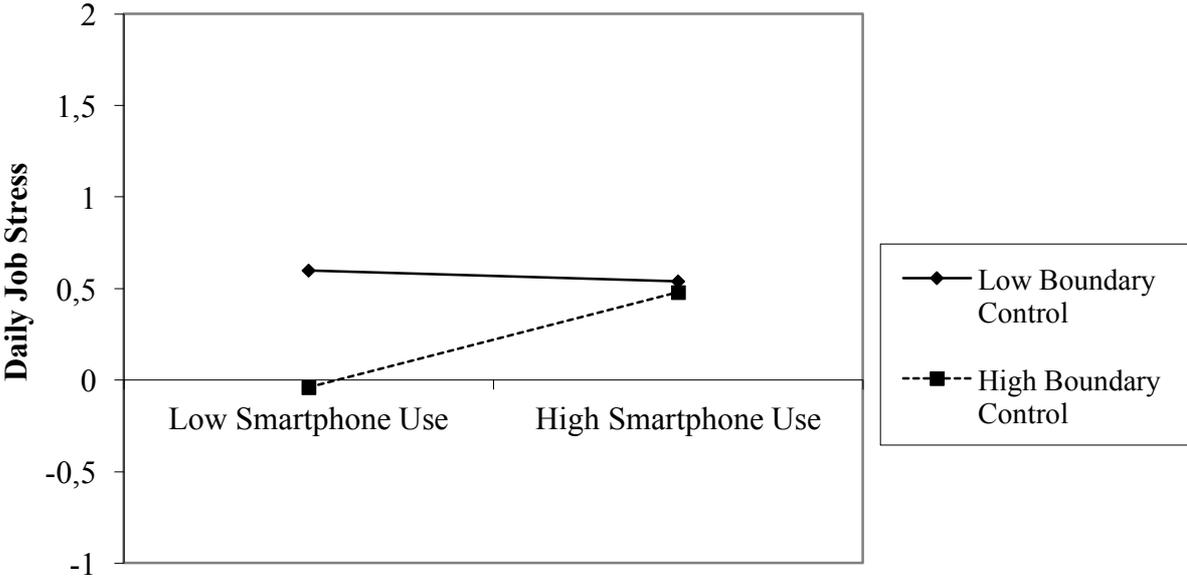


Figure 2. Moderation of boundary control on the relationship between daily work-related smartphone use in non-work hours and daily job stress.

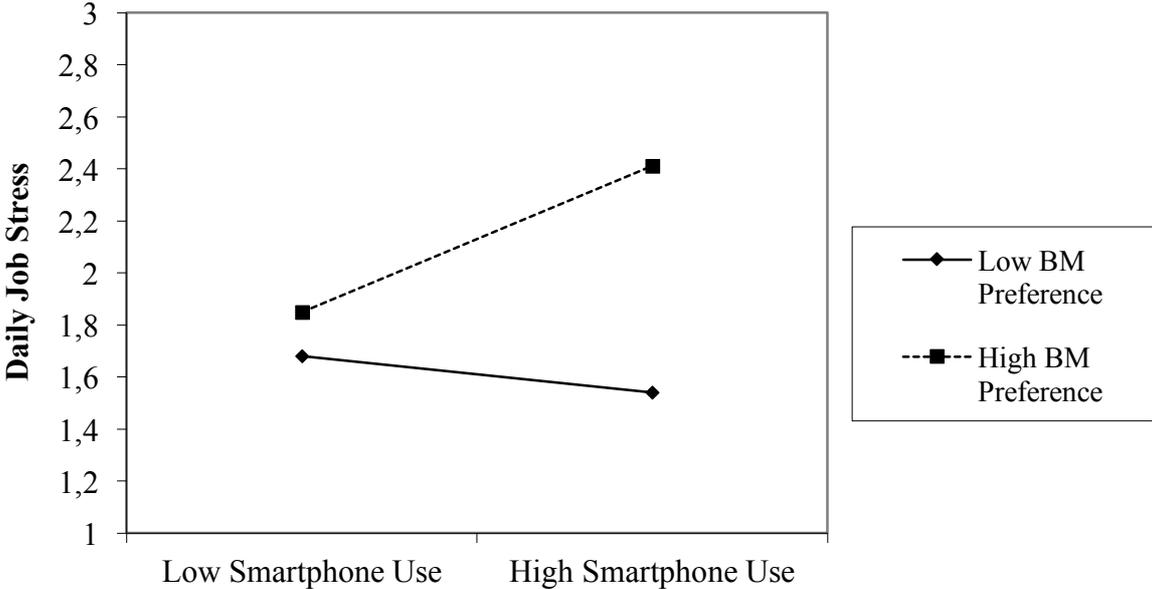


Figure 3. Moderation of boundary management preference on the relationship between daily work-related smartphone use in non-work hours and daily job stress.

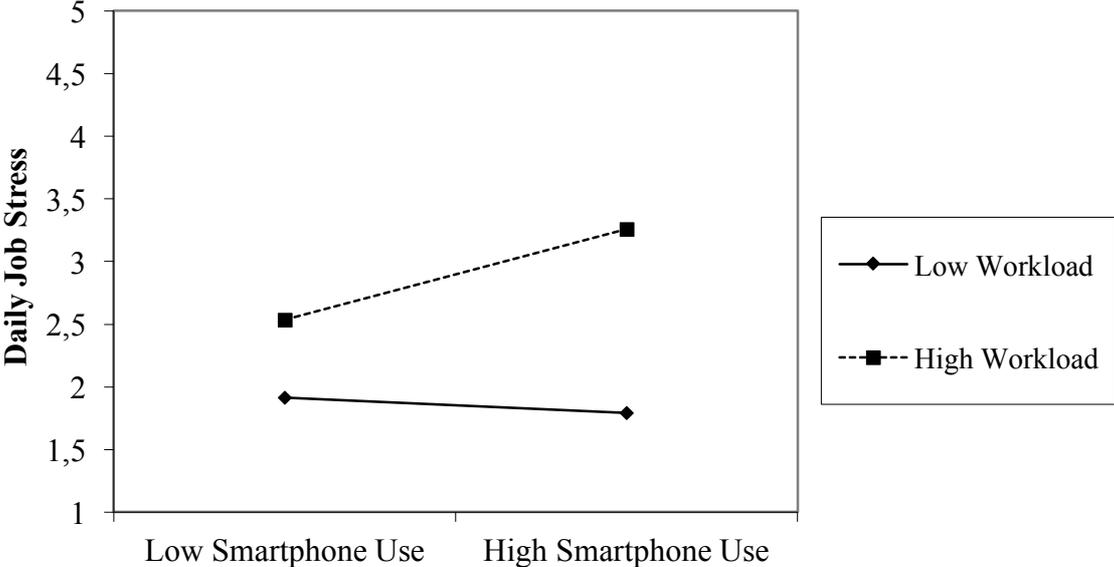


Figure 4. Moderation of workload on the relationship between daily work-related smartphone use in non-work hours and daily job stress.

Table 1

*Means, Standard Deviations, and Correlations of all Study Variables*

	Mean	Std.	1.	2.	3.	4.	5.	6.	7.	8.
1. Age	39.67	8.22								
2. Gender	1.24	.43	-.34**							
3. Tenure	8.83	7.04	.65**	-.22**						
4. BC	5.09	1.34	.23**	-.11*	.08					
5. BM Preference	4.49	1.45	-.17**	-.02	-.10	.05				
6. Workload	3.92	1.49	-.28**	.01	-.28**	-.28**	-.05			
7. BM Enactment	3.84	1.79	-.18**	.00	-.11*	-.37**	-.35**	.45**		
8. Smartphone Use	3.93	1.78	-.34**	.02	-.28**	-.32**	-.22**	.44**	.79**	
9. Job Stress	3.21	1.43	-.26**	.02	-.22**	-.25**	.11*	.64**	.41**	.45**

\*\*  $p < .01$ , \*  $p < .05$ .

*Note: N = 96 persons. Correlations between daily variables are based on averaged scores across the four days that the study took place. For BM preference a higher score indicates a preference for segmentation, for BM enactment a higher score indicates the enactment of integration preference.*

Table 2

*Multilevel Results of the Relation Between Daily Boundary Management Enactment and Daily Work-related Smartphone Use in Non-Work Hours (Hypothesis 1).*

	Daily Smartphone Use			
	Control model		Predictor model	
	<i>Estimate</i>	<i>Std. er.</i>	<i>Estimate</i>	<i>Std. er.</i>
Intercept	3.89**	.16	3.89**	.16
Workload	.13*	.06	.00	.05
Tenure	-.07**	.02	-.07*	.02
BM enactment			.57**	.06
Variance level 2 (employee)	2.13 (75%)	.34	2.18	.34
Variance level 1 (day)	.71 (25%)	.06	.53	.05
-2 Log likelihood	1082.44		1009.15	

\* $p < .01$ ., \*\*  $p < .001$

*Data points = 343 of 384 cases in use (respondents,  $n = 96$ , Days,  $n = 4$ ).*

Table 3

*Multilevel Results of the Link Between Daily Work-related Smartphone Use in Non-Work Hours and Daily Job Stress (Hypothesis 2).*

	<b>Daily Job Stress</b>			
	Control model		Predictor model	
	<i>Estimate</i>	<i>Std. er.</i>	<i>Estimate</i>	<i>Std. er.</i>
Intercept	3.20**	.13	3.20**	.13
Workload	.35**	.05	.34**	.05
Tenure	-.01	.02	-.01	.02
Age	-.04*	.02	-.04*	.02
Smartphone use			.07	.05
Variance level 2 (employee)	1.33 (74%)	.22	1.33	.22
Variance level 1 (day)	.47 (26%)	.04	.46	.04
-2 Log likelihood	935.17		933.53	

\* $p < .01$ ., \*\*  $p < .001$

*Data points = 343 of 384 cases in use (respondents,  $n = 96$ , Days,  $n = 4$ ).*

Table 4

*Multilevel Results of the Interaction of Boundary Control and Daily Work-related Smartphone Use in Non-Work Hours on Daily Job Stress (Hypothesis 3).*

	<b>Daily Job Stress</b>			
	Predictor-only model		Interaction model	
	<i>Estimate</i>	<i>Std. er.</i>	<i>Estimate</i>	<i>Std. er.</i>
Intercept	3.18**	.12	2.03**	.28
Age	-.03	.02	-.01	.02
Tenure	-.02	.02	-.01	.02
Workload	.34**	.05	.36**	.05
Work-related Smartphone use	.07	.05	-.25**	.09
Boundary Control (BC)	-.23*	.09	-.37**	.09
BC x Smartphone use			.06**	.01
Variance level 2 (employee)	1.18 (72%)	.20	1.00	.17
Variance level 1 (day)	.46 (28%)	.04	.46	.04
-2 Log likelihood	915.61		897.13	

\* $p < .01$ , \*\*  $p < .001$

*Data points = 340 of 384 cases in use (respondents,  $n = 96$ , Days,  $n = 4$ ).*

Table 5

*Multilevel Results of the Interaction of Boundary Management Preference and Daily Work-related Smartphone Use in Non-Work Hours on Daily Job Stress (Hypothesis 4).*

	<b>Daily Job Stress</b>			
	Predictor-only model		Interaction model	
	<i>Estimate</i>	<i>Std. er.</i>	<i>Estimate</i>	<i>Std. er.</i>
Intercept	3.18**	.12	2.03**	.28
Age	-.04	.02	-.02	.02
Tenure	-.02	.02	-.01	.02
Workload	.34**	.05	.35**	.05
Work-related Smartphone use	.07	.05	-.25**	.09
BM preference	.06	.09	-.09	.08
BM preference x Smartphone			.07**	.02
Variance level 2 (employee)	1.26 (73%)	.21	.96	.16
Variance level 1 (day)	.46 (27%)	.04	.47	.04
-2 Log likelihood	920.97		904.41	

\* $p < .01$ ., \*\*  $p < .001$

*Data points = 340 of 384 cases in use (respondents,  $n = 96$ , Days,  $n = 4$ ).*

Table 6

*Multilevel Results of the Interaction of Workload and Daily Work-related Smartphone Use in Non-Work Hours on Daily Job Stress.*

	<b>Daily Job Stress</b>			
	Predictor-only model		Interaction model	
	<i>Estimate</i>	<i>Std. er.</i>	<i>Estimate</i>	<i>Std. er.</i>
Intercept	3.20**	.13	1.90**	.20
Age	-.04*	.02	-.01	.02
Tenure	-.01	.02	-.00	.02
Work-related Smartphone use	.07	.05	-.23**	.06
Workload	.34**	.05	.04	.06
Workload x Smartphone use			.08**	.01
Variance level 2 (employee)	1.33 (74%)	.22	.75	.13
Variance level 1 (day)	.46 (26%)	.04	.46	.04
-2 Log likelihood	933.53		887.23	

\* $p < .01$ , \*\*  $p < .001$

*Data points = 343 of 384 cases in use (respondents,  $n = 96$ , Days,  $n = 4$ ).*

Table 7

*Multilevel Results of the Link Between Daily Boundary Management Enactment and Daily Job Stress.*

	<b>Daily Job Stress</b>			
	Control model		Predictor model	
	<i>Estimate</i>	<i>Std. er.</i>	<i>Estimate</i>	<i>Std. er.</i>
Intercept	3.20**	.13	3.20**	.13
Age	-.04*	.02	-.04*	.02
Tenure	-.01	.02	-.01	.02
Workload	.35**	.05	.32**	.05
Daily BM enactment			.15**	.06
Variance level 2 (employee)	1.33 (74%)	.22	1.33	.22
Variance level 1 (day)	.47 (26%)	.04	.45	.04
-2 Log likelihood	935.17		928.15	

\* $p < .01$ ., \*\*  $p < .001$

*Data points = 343 of 384 cases in use (respondents,  $n = 96$ , Days,  $n = 4$ ).*