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Title: Boundary communication : how smartphone use after hours is associated with work-life conflict and organizational identification

Year: 2020

Version: Published version

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Please cite the original version:

van Zoonen, W., Sivunen, A., & Rice, R. E. (2020). Boundary communication : how smartphone use after hours is associated with work-life conflict and organizational identification. *Journal of Applied Communication Research*, 48(3), 372-392.
<https://doi.org/10.1080/00909882.2020.1755050>



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To cite this article: Ward van Zoonen, Anu Sivunen & Ronald E. Rice (2020): Boundary communication: how smartphone use after hours is associated with work-life conflict and organizational identification, Journal of Applied Communication Research

To link to this article: <https://doi.org/10.1080/00909882.2020.1755050>



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Published online: 29 Apr 2020.



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Boundary communication: how smartphone use after hours is associated with work-life conflict and organizational identification

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ABSTRACT

This study investigates how boundary communication mediates the effects of smartphone use for work after hours on work-life conflict and organizational identification. It draws upon boundary theory, work-family border theory, and a structural view of organizational identification. The research site was a large Scandinavian company operating in the telecommunications industry, with 367 employees responding to a survey at two time periods. In contrast to many studies, the use of information and communication technologies (here, smartphones) for after-hours work was not associated with work-life conflict, but was positively associated with organizational identification. However, communication about family demands with one's supervisor mediated the relationship between smartphone use and work-life conflict, whereas communication about work demands with family did not. Similarly, the association between smartphone use and organizational identification was positively mediated by communication with one's supervisor about family demands on work, but not through communication with family about work demands on family.

ARTICLE HISTORY

Received 25 April 2019

Accepted 9 January 2020

KEYWORDS

After-hours work; boundary spanning; organizational identification; smartphone use; work-family communication; work-life conflict

Organizational information and communication technologies (ICTs) have the potential to affect one's relationship with work. One underlying reason is that the multivalent involvement of ICTs in employees' daily lives promotes a norm of constant connectivity (e.g. Boswell et al., 2016; Mazmanian et al., 2013). Holtgrewe (2014) reviewed the broader rise of omnipresent connectivity due to a growing number of factors, such as bandwidth, cloud computing, the Internet of things, and big data. Cognizant of the widespread adoption and uses of ICTs and associated connectivity behaviors, many initiatives have been deployed at organizational and legislative levels to mitigate the potentially detrimental effects of ICT use. Most of these studies involve turning off mobile email servers to prevent employees from staying connected through email on their mobile devices after hours (BBC, 2012). At the national level, recent French legislation has articulated

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employees' right to disconnect (after hours) (Morris, 2017). However, in doing so, many workers are also deprived of the potential benefits associated with technology use and connectivity (ter Hoeven et al., 2016). Hence, this study examines the extent to which boundary spanning communication may mediate the relationship between smartphone use after hours and work-life conflict (Boswell & Olson-Buchanan, 2007) and identification (Fonner & Roloff, 2012).

The ability, and expectations, to constantly connect allows more effective use of work hours, but also fills up after-hours timespace with more work (Azad et al., 2016). The reverse is also true: now one's family and friends expect greater access and connectivity during work hours, creating interruptions to and distractions from work. We follow Boswell and Olson-Buchanan (2007) in using the term 'after-hours work,' referring to work conducted outside of regular or formal work hours or during non-work time. Thus, it does not include work as part of a formal telecommuting, flexible work, or free-lancing position (Fenner & Renn, 2010; Rice, 2017).

Studies repeatedly show that this constant connectivity increases after-hours work as well as communication about work, thus blurring the boundaries of different life domains (e.g. Boswell & Olson-Buchanan, 2007; Park & Jex, 2011). Furthermore, ICT use may also affect organizational identification (Fonner & Roloff, 2012; Wiesenfeld et al., 1999) by making the traditional boundaries between work and life roles more permeable. Indeed, the ability to reconcile work and life demands and roles is one of the substantial organizational challenges employees currently face (Ollier-Malaterre et al., 2013).

Thus far, attempts to deepen our understanding of these relationships have mostly relied on organizational or psychological perspectives. For instance, psychological detachment has been found to mediate the relationship between technology use and work-life conflict (Park et al., 2011), whereas social presence can mediate the relationship between technology use and identification (Fonner & Roloff, 2012). However, studies have not much considered the communicative processes associated with these boundary issues raised by ICTs, such as discussions among relevant actors about cross-boundary work or family demands.

Theoretically, communication provides an important link between ICT use and both work-life conflict and organizational identification, not only because the technology provides new means for communication, but also because its use and implications become topics of communication. For instance, technology use after hours can trigger communication about family demands with supervisors, as well as communication about work demands with family members. Communication about work may also strengthen organizational identification as it helps to establish, reinforce, and share organizational norms, values, and experiences, adding to ownership in shared meaning (Wiesenfeld et al., 1999). This study, therefore, examines the role of boundary communication – the extent to which work demands are discussed with one's family, and the extent to which family demands are discussed with one's supervisor (see Clark, 2002) – in how ICT use for work after hours affects work-life conflict and organizational identification. Thus, the two guiding research questions of this study are: *To what extent is smartphone use for after-hours work associated with work-life conflict and organizational identification;* and *To what extent does communication about cross-boundary demands mediate the relationships between smartphone use after hours and work-life conflict and organizational identification?*

Core concepts and research on relationships in this study boundaries, work-life conflict, and organizational identification

This study draws on boundary theory (Ashforth et al., 2000), work-family border theory (Clark, 2000), and a structural perspective on identification (Scott et al., 1998). These theories and models set the stage for investigating possible implications of ICTs use after-hours on conflicts across boundaries and on employees' identities, and how communication about such border-crossing mediates those relationships.

Boundaries and borders

Boundary theory (Ashforth et al., 2000) and work-family border theory (Clark, 2000) address the interdependence of different domains through boundary permeability. Boundary permeability is the extent to which one domain enters, overlaps, or intrudes on the other (Clark, 2002). Boundary theory generally focuses on the meaning people attach to work and home domains, and the ease and frequency with which they transition between different roles and across boundaries (Ashforth et al., 2000). For instance, Fenner and Renn (2010) draw on boundary theory to demonstrate that the use of communication technologies after hours for work increases work-life conflict. Work-family border theory tends to focus on the notion that employees strive to obtain a balance between different life domains, defined as satisfaction with work and home roles and a minimum of conflict between those roles (Clark, 2000). Work-family border theory (Clark, 2002) proposes that it is through everyday discussions with work and family members that employees socially construct boundaries and their meaning. This is supported by Adkins and colleagues (2014) who draw on work-family border theory to demonstrate that communication technologies and connectivity behaviors provide flexibility and efficiency, while also creating disruptions when employees transcend borders between work and family domains. Thus, both theories provide the foundation for our study as they address how people construct, maintain, enact, and communicate about cognitive and behavioral boundaries between work and non-work domains.

Work-life conflict

Typically, work-life conflicts can be seen as the negative effects of role pressures across the borders of one domain into another (Greenhaus & Beutell, 1985; Kahn & Quinn, 1970). These pressures and possible resulting conflicts are directional or asymmetric, both conceptually and empirically. That is, asymmetrically permeable boundaries refer to the idea that demands from one domain cross into the other domain with unequal frequency. For example, work demands may more frequently interfere with home demands than vice versa.

Organizational identification

Furthermore, boundary theory also highlights the importance of role identification – i.e. the psychological importance of a role or domain to one's self-concept (Ashforth et al., 2000; Clark, 2000; Park & Jex, 2011). Organizational identification, in particular, refers

to an emotionally satisfying and self-defining relationship with the organization. Boundaries demarcate the domains people are in at a certain time (e.g. at work or at home) and highlight identities that are salient in those domains (e.g. an identity of an employee or a parent) (Ashforth et al., 2000). Thus, organizational identification can be salient to an employee based on its subjective importance, but also on situational relevance. Situational relevance means that a person's organizational identification is salient while s/he is in a work domain, as identities can be triggered based, for example, on institutional symbols or surrounding people (Ashforth, 2001). However, ICTs can make the boundaries between domains (more) permeable and create situations in which organizational identity becomes salient to employees even while at home, by making institutional symbols and other organizational members accessible from a distance.

Typically, organizational identification is believed to facilitate boundary spanning behaviors and communication between different domains (Fieseler et al., 2014). In other words, employees with stronger organizational identities tend to look for ways to integrate that role with other parts of their identity. Conversely, identification is a process constructed through communication and shared organizational interests, and identities are instantiated in certain interactions or activities with other people and communication about multiple topics (Bullis & Bach, 1991; Cheney & Tompkins, 1987; Scott et al., 1998; Thatcher & Zhu, 2006). For instance, communication with managers can guide employees' ongoing enactment of organizational identities (Shamir, 1992). Thus, as employees communicate about their various roles (changing partially due to the use of ICTs) in different domains, they simultaneously construct, manage, and negotiate their identities as organizational and family members. These negotiations, or identity enactments, happen through interaction with others in both 'workplace and homespace' (Kirby et al., 2003, p. 13). This is especially likely when the topic of the communication is about the nature of, and intrusions across, boundaries that shape identities.

ICT use after hours, work-life conflict, and boundary communication

ICTs (i.e. smartphones) and work-life conflict

Organizational ICTs are blurring work and non-work (Boswell et al., 2016; Kaufman-Scarborough, 2006), as they enable 'workplace connectivity' regardless of place or time (Dery & MacCormick, 2012; Schlosser, 2002). The use of ICTs at home for work purposes is associated with both positive and negative effects for the employee (e.g. Derks et al., 2016; Rice, 2017).

The increased connectivity from ICT use has yielded positive effects, such as increased perceptions of autonomy and effectiveness (Mazmanian et al., 2013) and stronger employee engagement (ter Hoeven et al., 2016). ICTs may facilitate workers' ability to juggle work and family demands more effectively (Batt & Valcour, 2003). ICTs can help integrate multiple work and non-work roles, by allowing balance, flexibility, and access, and by increasing autonomy and ability to accomplish tasks (Valcour & Hunter, 2008).

However, negative effects include cross-border conflict. In particular, ICT use can lead to more frequent encroachment of work on family and personal time (Boswell & Olson-Buchanan, 2007; Park et al., 2011; Rice, 2017), blurring boundaries by presenting yet another job demand from one domain to the other (Voydanoff, 2005), and creating obligations of connectedness and reduced resources for family and personal life, thus

increasing work-life conflict (Valcour & Hunter, 2008). Several studies and reviews have examined and demonstrated relationships between ICT use after hours and work-life conflict (e.g. Boswell & Olson-Buchanan, 2007; Derks et al., 2015; Fenner & Renn, 2010; Golden & Geisler, 2007; Rice, 2017).

This boundary-blurring between work and personal life, as well as of the times and places to perform in both domains, has become especially pervasive since the widespread use of smartphones and the development of mobile broadband connections. Cousins and Robey (2015) focused on how mobile technology affordances (mobility, connectedness, interoperability, identifiability, and personalization) were used by mobile workers, often in situational-specific ways, to manage their work-life boundaries. Smartphones provide mobile, portable, and personalized access to communication, work and social networks, and information and application resources. Smartphone mobility, constant connectedness, and identifiability are likely to foster greater boundary-crossing than, say, landline telephone or desktop or even laptop computers. Knowledge workers can come to rely heavily on their smartphones both during their work and non-work time to perform work-related tasks, such as answering work emails while travelling or in the home domain, to continue activities from the current day as well as to prepare for the next (Derks et al., 2015; Derks & Bakker, 2014; Mazmanian et al., 2013; Rice, 2017). Richardson and Benbunan-Fich's study (2011) of media organization employees considered the influences of organization provision of wireless devices (25% of employees) and laptops (20%), individual dispositions, and organizational norms on work connectivity after hours. For wireless devices, organizational provision and individual role-integration preference explained two-thirds of the variance in work connectivity after hours. For laptops, subjective norms about organizational expectations toward after-hour work connectivity and reachability and a greater orientation toward multitasking explained 28%.

It is increasingly more common for organizations to encourage employees to bring their own devices or provide or pay for employees' cell phones or devices. Of 500 senior executives surveyed, about half indicated their organization provided their employees a device; the other half relied on employees bringing their own device, and about half of those offered partial payment for the costs (Driscoll, 2019). Such policies encourage the use of these devices for work independent of time and place, though also raise a wide variety of issues for organizations, supervisors, and employees to resolve (Phonecheck, 2018).

Using a smartphone after hours can signal family members that the person is working and not engaging in other domains, e.g. in his/her family role, thus creating a conflict between one's work and family or personal life. A focus on smartphones seems especially worthwhile given the current shift in scholarship and practice from a focus on mobility to a focus on constant connectivity (Dery & MacCormick, 2012). The nature of smartphone use – continuous notifications, demands for attention, and user's desire, addiction, or felt pressure to be responsive to even small inquiries (Von Bergen et al., 2019) – may arguably make these technologies even more pervasive than laptops. Indeed, smartphone use is more aptly characterized by short duration, isolated, and reward-based sessions than laptops are, making smartphones significantly more pervasive in everyday life (Oulasvirta et al., 2012). As such, workers may struggle to find balance in their use of smartphones for work while at home. Hence, we hypothesize:

H1: Smartphone use for work after hours is positively related to work-life conflict.

Boundary communication

Thus far, the research on work-life boundaries and ICT use noted above has predominantly focused on psychological and organizational processes. For instance, technology use outside the office has been linked to stress (Fonner & Roloff, 2012), emotions (Boswell et al., 2016; Butts et al., 2015), work-related attitudes (Boswell & Olson-Buchanan, 2007), and organizational (Fenner & Renn, 2010) and social expectations (Adkins & Premeaux, 2014). One specific example is Mellner's (2016) study of a large sample of organizational professions which reported that psychological detachment was associated with extensive use of smartphones for work, and expectations of being available, and low control over work-leisure boundary. Furthermore, boundary control tended to buffer the negative effects of smartphone use and availability expectations. These studies are important and help to understand the psychological consequences of technology use and the blurring of organizational and personal boundaries.

However, research on ICTs and work-life boundaries typically has not much considered employees' communication, such as what they are communicating about and with whom, when they are experiencing these psychological responses (see Butts et al., 2015, for an exception), nor what role communication plays in constructing and evaluating these experiences. Focusing on the communication of employees who are using smartphones for work after hours helps to understand how employees negotiate and construct their demands and identities as organizational and family members, and provides insights into how workers may deal with potentially negative boundary spillover effects (Clark, 2002).

Some employees try to regulate their connectivity by switching off their communication devices, leaving them at the office or simply not answering them (Wajcman et al., 2008). However, in many cases such strategies are not feasible, as they may hurt perceived effectiveness, career opportunities, and job performance (Mazmanian et al., 2013). Several meta-analyses have pointed to the importance of social support in reducing work-life conflict (e.g. Kossek et al., 2011). Indeed, social support has been related to lower levels of work and family demands, thus reducing work-life conflict (Carlson & Perrewé, 1999). Most studies conceptualize social support as the extent to which people can get emotional and instrumental support (Adams et al., 1996; Carlson & Perrewé, 1999; Nohe & Sonntag, 2014). However, echoing the idea of work-life border theory (Clark, 2002), we suggest that boundary communication about work-life permeability (in both directions) may provide employees with support in addressing demands of work and life, helping them to reduce work-life conflict. That is, we emphasize how specific communication processes play a role in the diverse effects of organizational ICTs, after-hours work, and salient outcomes.

As noted, smartphone use after hours for work, or for family-related matters during work hours, might trigger communication about work and family demands with one's family or supervisor. Research suggests that conversations about after-hour connectivity with supervisors and colleagues may help in establishing clear expectations about connectivity alleviating potential stressors associated with technology use (Fonner & Roloff, 2012). Hence, we suggest that ICT use after hours is likely to induce boundary communication (in both directions) as employees need to negotiate when and where connectivity is acceptable. Such conversations may help to alleviate potential stressors that cause conflict and negotiate meaning about, and to better understand, the demands of different life roles.

H2a: Smartphone use after hours is positively related to communication about family demands with one's supervisor, which in turn is negatively related to work-life conflict.

H2b: Smartphone use after hours is positively related to communication about work demands with one's family members, which in turn is negatively related to work-life conflict.

ICT use after hours, organizational identification, and boundary communication

ICT use (i.e. smartphones) and organizational identification

The use of ICTs can influence organizational identification, depending on when and with whom employees are using it (Scott & Timmerman, 1999). For instance, several studies have demonstrated that organizational identification can lead to identity overlap in online contexts (Fieseler et al., 2015) and work-related communication on personal social media platforms (van Zoonen & Treem, 2019). Fonner and Roloff (2012) demonstrated that ICT use may facilitate organizational identification because it allowed employees to stay connected and increase their social presence, thereby enabling them to (re)produce their organizational identities. Note, however, they did not find support for any direct relationships between ICT use and identification. In the context of ICT use after hours, work and home role identification has been related to cross-role involvement (Olson-Buchanan & Boswell, 2006). Wiesenfeld and colleagues (1999) found that the more heavily teleworkers used ICTs for work, the more they identified with their organization. Hence, we argue that

H3: Smartphone use after hours is positively related to organizational identification.

Boundary communication

ICT use after hours can serve as a catalyst for employee empowerment, as it may provide opportunities to act by sharing and asking for information from supervisors about work-family issues (Kirby et al., 2003). As the work-related use of ICTs after hours likely takes place in the home domain, it may trigger communication with the supervisor about family demands. In the context of teleworking, a frequent concern is the constant connectivity and employees' efforts to make sure they are kept in the office communication loop (Dery & MacCormick, 2012). Conversations with supervisors about after-hours connectivity may be crucial for employees in managing that connectivity and in enacting appropriate identities. Research shows that informal supervisor support is not only crucial in decreasing work-family conflict, but it plays an important role in influencing employee wellbeing, job satisfaction (Goh et al., 2015), and organizational identification (Wiesenfeld et al., 2001).

Specifically, we argue that boundary spanning communication is likely when members' role identities are salient (Olson-Buchanan et al., 2016). Such boundary communication with one's supervisor may further strengthen an employee's identity as an organizational member. Research has shown that high-quality leader-member exchange increases employees' organizational identification, as seeking information about one's membership in the organization often happens through immediate supervisors and as supervisors may provide important identity information for the employee (Loi et al., 2014). Being able to

discuss family demands with supervisors may create a stronger organizational identification if the supervisor also understands and values the employee's role and demands as a family member.

Similarly, being able to discuss work demands with family members can build stronger organizational identification. When employees are able to share their work demands with family members and discuss their role as organizational members at home this may strengthen their organizational identities as it allows them to contextualize their at-home work within their organizational context and to better integrate work in their life roles. Thus, it could be argued that work-related ICT use after hours creates more opportunities for discussion with supervisors, and more engagement in one's organizational role, in turn, strengthening one's organizational identification.

H4a: Smartphone use after hours is positively related to communication about family demands with one's supervisor, which in turn is positively related to organizational identification.

H4b: Smartphone use after hours is positively related to communication about work demands with one's family members, which in turn is positively related to organizational identification.

Methods

Research site

The studied organization was a Scandinavian telecommunications company; one of its headquarter offices, with more than 1,500 employees, participated in the study. This study was a part of a larger research project and researchers met several times with the company representatives (from HR and IT departments) to establish rapport and to agree on research procedures.

All of the employees at the headquarters were knowledge workers, meaning that even though they worked at different levels of the organization, their work consisted of finding, creating, or applying knowledge to a production process or a problem (Kelloway & Barling, 2000). Some of the employees worked flexibly or from homes irregularly. 94.9% ($n = 835$) of the 71.6% who responded to the question indicated that the organization had provided them, or paid for, a smartphone. The discussions with HR managers of the organization confirmed that even though some of the employees worked flexibly and did telework, all employees had firmly set working hours, and smartphone use after hours would vary across individuals at their own discretion. The flexible work guidelines of the organization stated:

Working hours are controlled as agreed on with the manager. Regular working hours are followed during flexible work, but the employees decide themselves on the timing of their working hours. For this reason, no evening or night pay or extra pay for working on a Saturday, Sunday or mid-week holiday is paid for flexible work, unless the employer specifically requires the employee to work at such hours.

Thus, we were confident that the employees had experience with using smartphones for work-related tasks as well as on after-hours working, but that they also had the resources to complete their work during the set working hours.

Sample

Two surveys were conducted at the organization one year apart. The one-year time interval was chosen as it was convenient for the studied organization; this way their regular internal employee surveys did not overlap with either of the current study's surveys. To keep both of the surveys as short as possible as agreed with the organization, the first survey measured employees' work-related smartphone use after hours, and the second survey measured several outcome variables related to boundary dynamics and organizational identification. The survey was administered among all employees working at the company's headquarters (T1 $N = 1538$; T2 $N = 1447$). The response rate for the T1 survey was 54.4% ($N = 837$), and for the T2 survey 49.3% ($N = 714$). Of the 714 respondents in T2, 367 respondents also completed the survey at T1 (51.4%). Out of these 367 respondents, 54.9% were male; on average the respondents have been working at this company for 17.14 years ($SD = 9.42$), and the typical workweek in this organizations comprised 39.68 h ($SD = 5.92$). Generally, the respondents were highly educated with 32.7% having earned a university degree and 37.6% graduated from an applied university. The majority of the respondents were between 41 and 50 years old and about 53% of the respondents had at least one child living at home.

Selective dropout was examined by comparing the scores of respondents who only completed the first survey ($N = 470$) to the scores of those who completed both surveys ($N = 367$). The T1 respondents did not significantly differ from those who completed both surveys in terms of age groups: $\chi^2(4) = 5.30, p = .258$; educational background $\chi^2(4) = 0.567, p = .907$; organizational tenure ($M_1 = 16.79, SD = 9.48; M_{t1+t2} = 16.26, SD = 9.37; \Delta M = 0.533, t = 0.790, p = .430$); and working hours per week ($M_{t1} = 39.64, SD = 6.33; M_{t1+t2} = 39.30, SD = 5.45; \Delta M = 0.341, t = 0.815, p = .415$). Respondents who were not part of the sample after the T1 survey were significantly more likely male than female $\chi^2(1) = 7.784, p = .005$. In addition, there are 347 respondents who completed the T2 but not the T1 survey. These participants did not differ in terms of age groups: $\chi^2(4) = 7.91, p = .095$; educational background $\chi^2(4) = 0.174, p = .982$; organizational tenure ($M_{t2} = 17.99, SD = 10.04; M_{t1+t2} = 16.26, SD = 9.37; \Delta M = 1.73, t = 1.233, p = .218$); and working hours per week ($M_{t2} = 40.24, SD = 19.16; M_{t1+t2} = 39.30, SD = 6.33; \Delta M = 0.960, t = 0.506, p = .613$). However, comparatively, there were fewer male respondents who dropped out between T1 and T2 survey than female respondents $\chi^2(1) = 5.311, p = .021$. Hence, overall respondents who completed both questionnaires did not differ much from those who completed only one questionnaire.

Measures

Independent variable

At T1 we asked respondents about their smartphone use and their experiences with work-related communication. The specific prompt was "Think about your smart phone use outside formal work hours. How often do you use the smart phone in the following ways to perform your work outside of formal work hours (before or after work, on weekends, during vacations)?" Based on a preliminary set of interviews and observations at the company to determine what functions employees used most (see also Boswell & Olson-Buchanan, 2007), we asked about three uses: for voice conversations, sending/receiving

text messages, and sending/receiving email, with response choices from 1) never to 7) every day.

Mediating and dependent variables

In the T2 survey, we asked employees about their boundary communication, perceived work-life conflict, and organizational identification.

Discussing family demands with supervisor was examined using four items measuring the extent to which employees agree with statements like: 'I discuss my family obligations with my supervisor' (Clark, 2002). In turn, *discussing work demands with family* was measured using three items referring to the extent to which employees discuss work demand with family, such as: 'I discuss my work obligations with my family' (Clark, 2002).

Work-life conflict was examined with four items measuring the extent to which employees felt work negatively affected their personal life. Hence, we specifically focused on conflict in one direction, in the results we use work-life conflict to refer to work to life conflict. The items were adopted from Hayman (2005) and include statements such as: 'My personal life suffers because of work.'

Organizational identification was measured using six items from Mael and Ashforth (1992). Items include: 'When I talk about my organization, I usually say we rather than they.' The response choices for all these items ranged from 1) strongly disagree to 7) strongly agree, unless indicated otherwise. Table 1 provides the wording, factor loadings, and descriptive statistics for all items. Table 2 shows the validity statistics.

Control variables

To control for possible alternative explanations for the variables in the model we measured *gender*, *age*, and *education*. Furthermore, *organizational tenure* was measured, as it has been related to both organizational identification and ICT use (Fonner & Roloff, 2012). We also assessed whether employees felt that their *employer expected them to use communication technology outside of formal work hours*. On the scale of 1) strongly disagree to 7) strongly agree, they reported $M = 4.15$ ($SD = 1.8$), or slightly more than 'neither disagree nor agree.' Finally, especially in the relationship between smartphone use and work-life conflict, experiencing the use of these devices after hours as stressful may be a source of conflict itself. Therefore, we controlled for 'I experience work-related communication after hours as stressful.' Notably, experiencing work-related communication after hours as stressful was significantly associated with work-life conflict ($B = .319$ [.147; .471], $p = .001$). However, stress did not affect any of the hypothesized relationships, nor was it related to any of the other variables in the model. Overall, results for the hypothesized relationships remained equivalent with and without all control variables in the final causal model, so the final models reported below do not include the controls.

Analysis

The hypothesized model was examined using Structural Equation Modeling (SEM) in Amos. We have used incremental fit indices – Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) – as well as absolute fit indices – Standardized root mean squared residual (SRMR) and the root mean square of approximation (RMSEA) – to gauge model fit. Finally, the χ^2 is also reported mainly as a comparative index. Maximum Likelihood

Table 1. Descriptive statistics and measurement model values.

Item	M (SD)	R ²	St. factor loading	Unst. factor loading ^a	SE
<i>Smartphone use after hours T1</i>					
Voice conversations	5.31 (1.68)	.84	.918	1.000 ^b	–
Sending/receiving text messages	5.14 (1.80)	.87	.933	1.693	.08
Sending/receiving email	5.17 (2.23)	.36	.542	1.208	.11
<i>Discussing family demands with supervisor T2</i>					
I discuss my family obligations with my supervisor	4.11 (1.63)	.87	.933	1.000 ^b	–
I discuss demands on me at home with my supervisor	3.78 (1.67)	.77	.875	0.959	.05
My supervisor understands my family demands	4.85 (1.35)	.34	.584	0.521	.04
<i>Discussing work demands with family T2</i>					
I discuss my work obligations with my family	4.90 (1.73)	.84	.913	1.000 ^b	–
I discuss demands on me at work with my family	4.88 (1.67)	.95	.976	1.036	.04
I share unpleasant things that happened at work with my family	4.29 (1.71)	.39	.625	0.678	.05
I talk with my family about what kind of day I had at work	4.62 (1.61)	.49	.698	0.712	.04
<i>Work-life conflict T2</i>					
Personal life suffers because of work	2.89 (1.49)	.86	.930	1.000 ^b	–
I neglect personal needs because of work	2.98 (1.62)	.69	.832	0.974	.04
I put personal life on hold for work	2.73 (1.49)	.51	.712	0.770	.05
My job makes personal life more difficult	2.46 (1.23)	.82	.905	0.807	.03
<i>Organizational identification T2</i>					
When someone criticizes my organization, it feels like a personal insult	3.91 (1.55)	.69	.829	1.000 ^b	–
I am very interested in what others think about my organization	4.67 (1.36)	.51	.711	0.753	.05
When I talk about my organization, I usually say ‘we’ rather than ‘they’	5.37 (1.28)	.47	.688	0.689	.05
My organization’s successes are my successes	5.53 (1.22)	.53	.730	0.693	.06
When someone praises my organization, it feels like a personal compliment	4.71 (1.43)	.66	.812	0.903	.05
If a story in the media criticized my organization, I would feel embarrassed	4.11 (1.44)	.45	.672	0.753	.06

^a All factor loadings are significant at $p < .05$; ^b Unit loading indicator constrained to 1.0.

Table 2. Factor correlation matrix with validity statistics.

Variable	M (SD)	CR	AVE	MSV	MaxR(H)	1	2	3	4	5
1 Smartphone use (T1)	4.77 (1.58)	.85	.67	.04	.93	.82				
2 Comm about family demands (T2)	4.24 (1.35)	.85	.66	.08	.91	.14	.81			
3 Comm about work demands (T2)	4.67 (1.47)	.89	.67	.08	.96	.12	.29	.82		
4 Work-life conflict (T2)	2.87 (1.40)	.91	.72	.03	.93	-.01	-.10	.06	.85	
5 Identification (T2)	4.72 (1.08)	.88	.55	.04	.89	.20	.20	.14	-.16	.74

Notes: CR = Composite Reliability; AVE = Average Variance Extracted; MSV = Maximum Shared Variance; MaxR(H) = Maximum Reliability. Square Root of the AVE is reported in **bold** on the diagonal. Correlations above .15 are significant at $p < .01$; above .12 are significant at $p < .05$; above .09 at $p < .10$.

(ML) estimation with bootstrapping (5000 resamples) was used to estimate model parameters, confidence intervals, and standard errors for direct and indirect relationships.

Results

Measurement model

The measurement model indicated good fit: $\chi^2 (157) = 360.23$; CFI = 0.96; TLI = 0.95; SRMR = 0.05 and RMSEA = 0.059 (CI: 0.051, 0.068). Table 2 reports measurement validity

statistics. The latent variables in the model demonstrate good composite reliability, ranging from .84 to .90. Convergent and discriminant validity were assessed to gauge construct validity. The average variance extracted ranged from .55 to .72 (all above the threshold of .50). Table 2 further shows that the maximum and average shared variance does not exceed the average variance extracted. In other words, the latent constructs share more variance with their observed indicators than with other latent constructs. Hence, the measurement model shows sufficient convergent and discriminant validity, justifying further inquiry into the structural dynamics in the model.

Structural model

The structural model demonstrated good fit statistics: $\chi^2(158) = 367.80$; CFI = 0.96; TL I = 0.95; SRMR = 0.05 and RMSEA = 0.060 (CI: 0.052, 0.068). The final model with standardized regression weights is represented in Figure 1. The regression weights reported below are unstandardized regression weights. Table 3 provides results for both direct and indirect relationships.

Direct effects (H1 and H3)

Before examining the indirect effects, we examine the direct effects between smartphone use after hours and work-life conflict and organizational identification, as hypothesized in H1 and H3. The results indicate that smartphone use after hours at T1 is not significantly related to work-life conflict at T2 ($B = -.010$ [-.109; .092], $p = .889$). Therefore, hypothesis 1 is not supported. Hypothesis 3 reflects the notion that smartphone use after hours is directly related to organizational identification. The results support hypothesis 3, demonstrating a positive significant effect ($B = .163$ [.076; .258], $p = .001$). Next, we examined these relationships in more depth by investigating the indirect effects.

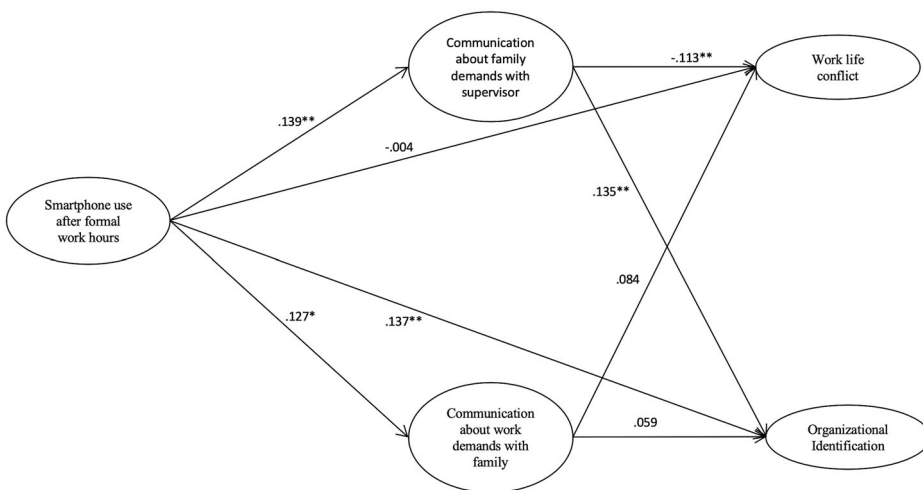


Figure 1. Simplified structural equation model with standardized effects. Note: Standardized structural regression weights are shown. *** $p < .001$, ** $p < .05$.

Table 3. Regression Weights Structural Analysis for Direct and Indirect Effects.

	<i>b</i> *	BC 95% CI		<i>p</i>	Bootstrap		BC 95% CI		<i>p</i>	
		Low	Up		β	SE	Low	Up		
<i>Direct effects x → y</i>										
H1 Smartphone use → work-life conflict	-.005	-.117	.108	.984	-.004	.05	-.106	.097	.986	
H3 Smartphone use → organizational identification	.164	.054	.271	.006	.137	.05	.047	.229	.005	
<i>Indirect effect x → m → y</i>										
H2a Smartphone use → comm family demands w/sup → work-life conflict	-.017	-.048	-.002	.028	-.016	.01	-.046	-.002	.027	
H2b Smartphone use → comm work demands w/fam → work-life conflict	.012	-.002	.042	.114	.011	.01	-.002	.039	.111	
H4a Smartphone use → comm family demands w/sup → organizational identification	.022	.004	.055	.018	.019	.01	.003	.048	.018	
H4b Smartphone use → comm work demands w/fam → organizational identification	.009	-.003	.038	.141	.008	.01	-.003	.031	.148	

Indirect effects (H2 and H4)

Hypothesis 2 suggests that smartphone use for work after hours is related to work-life conflict through boundary communication. In the model without the mediators there was not a statistically significant relationship between smartphone use and work-life conflict ($B = -.010 [-.109; .092]$, $p = .889$). Similarly, in the retained full structural model, smartphone use after hours did also not yield a statistically significant effect on work-life conflict ($B = -.004 [-.106; .097]$, $p = .986$). Regardless, we proceed to test the indirect effects between smartphone use after hours and work-life conflict through boundary spanning communication, as articulated in hypothesis 2. For a discussion on indirect effects and (partial) mediation see Hayes (2009). First, hypothesis 2a reflects the assumption that smartphone use after hours is positively related to communication about family demands with one’s supervisor ($B = .139 [.016; .265]$, $p = .026$), which in turn is negatively related to work-life conflict ($B = -.113 [-.230; -.001]$, $p = .048$). In line with hypothesis 2a these direct effects yield a significant negative indirect effect between smartphone use after hours and work-life conflict, through communication about family demands with one’s supervisor ($B = -.016 [-.046; -.002]$, $p = .027$). These findings support the rationale that these conversations may provide support and contribute to an understanding about employees’ role demands, thereby alleviating sources of work-life conflict.

Note though that there was no statistically significant indirect relationship between smartphone use for work and work-life conflict through communication about work demands with family members ($B = .011 [-.002; .039]$, $p = .111$) (H2b). Indeed, smartphone use after hours is not significantly related to communication about work demands with one’s family members ($B = .127 [-.012; .258]$, $p = .076$). In addition, no significant effect was found between these communication dynamics and work-life conflict ($B = .084 [-.027; .181]$, $p = .137$). Overall then, the results imply a significant indirect effect through communication about family demands with the supervisor in line with H2a, but did not support such an indirect effect through communication about work demands with the family (H2b).

Hypothesis 4 reflects the assumption that smartphone use for work after hours is positively related to organizational identification through boundary communication. Notably, there is a statistically significant indirect relationship between smartphone use after work hours and organizational identification through communication about family demands with the supervisor ($B = .019$ [.003; .048], $p = .018$) (H4a). However, smartphone use for work after hours is not related to organizational identification indirectly through communication about work demands with family members ($B = .008$ [-.003; .031], $p = .148$) (H4b). The direct relationship between smartphone use for work and organizational identification remained statistically significant ($B = .137$ [.047; .229], $p = .005$), but smaller ($\Delta B = .019$) in the model with the mediators, suggesting partial mediation.

Discussion

This study examines how smartphone use for work after hours may be associated with work-life conflict and organizational identification and how communicating about cross-border demands mediates those relationships. With respect to the first research question, while smartphone use for work after-hours is not significantly directly associated with work-life conflict in this organizational context, it is significantly associated with higher organizational identification. With respect to the second research question, communicating about cross-boundary demands exhibits some mediating influences.

Theoretical contributions

In addition to the conceptual asymmetrical boundary permeability between work and family domains (e.g. Frone et al., 1992; Pleck, 1977; Rice, 2017), as argued in work-family border theory (Clark, 2002), the mediating effects of communicating about demands across those domains are also potentially directional or asymmetrical. Communicating with one's supervisor about family demands on work mediates the relations of smartphone use for after-hours work with work-life life conflict and partially mediates the relationship with an employee's organizational identification. However, communication about work demands with family members does not. As such, the findings contribute to a better understanding of how the use of ICTs for after-hours work is related to work-life conflict (Boswell & Olson-Buchanan, 2007).

This finding allows for some speculation about the role of boundary spanning communication. First, supervisors may be important actors in alleviating some of the negative implications of smartphone use after hours for work-life conflict. This makes sense as articulating other role demands by employees to their supervisors may lead to shifting expectations about connectivity behavior after hours. Similarly, supervisors may reciprocate by providing employees more leeway in addressing family-related issues. In turn, spouses may demonstrate similar support and understanding in the context of life-work conflict and personal smartphone use at work.

Second, we have argued that communication across borders may be helpful because it may create a common understanding, shared expectations about connectivity, and perhaps even support for voiced demands in other life domains. However, if workers cannot find solace in their boundary spanning communication, for instance because spouses or supervisors are unsupportive (discussed in the future research section), this

may have adverse effects and may even exacerbate perceived work-life conflicts. Both these issues warrant further scholarly attention.

The results also shed light on the processes of organizational identification in an era characterized by the blurring of work and life domains and constant connectivity through ICT use. The finding that smartphone use after hours is directly associated with greater employee organizational identification, and also when mediated by communicating about family demands with their supervisor, shows that identification is at least constructed through communication and not only about work-related issues (see e.g. Smidts et al., 2001) but also on issues related to an employee's personal life, such as family demands. Thus, it is not only the amount of communication that is associated with organizational identification (e.g. Wiesenfeld et al., 1999), it is also the content and the direction of the shared information, as well as the extent to which one's work and non-work identities overlap in communication (Fieseler et al., 2014).

Practical implications

The findings underscore the role of workplace support – specifically, the role of employee-supervisor communication in relation to work-life conflict and organizational identification in the context of organizational ICT use (Fonner & Roloff, 2012; Kossek et al., 2011; Rice, 2017; Wiesenfeld et al., 1999).

Our findings indicate that discussing family demands on work with one's supervisor can help navigate and negotiate between family and work demands and reduce possible effects of after-hours ICT use on work-life conflict. Such communication can build understanding and helps a supervisor to sympathize with demands a worker experiences or at least provides a conversation partner who is willing to listen. We would particularly emphasize that supervisors should be proactive in encouraging such communication about both directions of these cross-boundary demands and both directions of work-life conflicts.

This finding has important managerial implications. First, as noted in the introduction, many recent initiatives for dealing with excessive connectivity through mobile devices are directed toward eliminating the device, time, or place of connectivity, such as anchoring the right to disconnect in national policies (Morris, 2017). After such rights were initiated by France, other western countries and legislative bodies have proposed to adopt similar rights, including the Netherlands, Luxembourg, and Canada (Collins et al., 2019). Multiple companies have followed Volkswagen's example including industry colleague Daimler (Chalupiak, 2018). However, the problem with these initiatives is that they also deprive workers of the advantages of these technologies, including efficient communication across time and space, autonomy, and identification (Fonner & Roloff, 2012; ter Hoeven et al., 2016). Our results indicate that boundary communication may mitigate the negative effects of smartphone use on work-life conflict and account for some part of the positive effects on identification. Hence, we would argue that managerial training programs should focus on enabling supervisors and employees to discuss role demands, beyond those associated with the work tasks – e.g. including discussing family demands at work. Specifically, these programs should focus on how these communicative processes between supervisors and employees can contribute to a mutual understanding and sense of support for employees' perceived role demands. Arguably, the positive role of these

communication processes is largely dependent on the extent to which these are interpreted as supportive. Future research may want to examine the extent to which communication that does not result in understanding and support may lead to adverse effects and strong (er) negative consequences (e.g. conflict) as employees feel trapped in unresolvable tensions between work and family demands that are not intensified by unsupportive spouses or supervisors.

For a comprehensive discussion of practical guidelines on workplace connectivity after hours for organization and managers, see Boswell and colleagues (2016). These include policies for after-hours work communication, training and guidelines for both supervisors and employees, considering stakeholder norms concerning such communication, integrating training and expectations into both socialization and ongoing education, assessing use through regular audits, and making legal guidance available to managers.

Limitations and future research

We acknowledge a few limitations of this study, as well as possibilities for future research. First, although we measured smartphone use at one time period and boundary communication, work-life conflict, and organizational identification at a subsequent time period, so that we avoid the typical problems of asserting causality in cross-sectional studies, we have minimized claims about causality. In order to make stronger causal claims and to test mediation, all variables should be measured at least at three different, and reasonably proximal, time points. However, the study demonstrates how smartphone use for work may be associated with significant direct and indirect effects even a year later. We also note that the T1 survey did ask about other smartphone applications (web browsing, calendars, social media, others), but usage was too infrequent to assess. With increased usage, these features may contribute to effects on work-life conflict and organizational identification.

Second, this study has examined boundary communication in both directions (with supervisor and with family). However, in terms of ICT use, the focus was on work-related use after hours, thereby neglecting the informal or social use of ICTs while at work, and potential life-work conflict. Similarly, we have only examined organizational identification, not investigating the other direction, family-role identification. Hence, future studies should examine boundary conflict and multiple forms of identification in both directions.

Third, although this study did not examine specific moderators, there is a pressing need to better understand the conditions under which these effects may be stronger or weaker. Future studies may direct attention to the moderating role of social norms and expectations about connectivity, as they may influence how ICT use for after-hours work affects boundary management and identification (e.g. Derks et al., 2015; Ragsdale & Hoover, 2016). Another important moderator to consider is how employees' boundary management preference affects technology use and its implications for boundary spillover effects (Clark, 2002; Derks et al., 2016). Such preference can affect whether after-hours ICT communication is perceived more negatively or positively (Rice, 2017). For example, employees with a boundary segmentation (rather than integration) preference were more likely to perceive greater interference and bother for their personal lives from after-hours electronic communication in Boswell et al.'s (2016) study.

Fourth, this study relies on self-reports. Future studies may benefit from multiple-source data, for instance by including significant others' interpretation of boundary spillover into home and life (e.g. Boswell & Olson-Buchanan, 2007) or supervisors' or team members' ratings of connectivity expectations (e.g. Ellwart et al., 2013). Additionally, it would be worthwhile to consider actual conversation transcripts, rather than relying on self-reported measures of cross-boundary communications. This way we would also be able to better account for the generalizability and the quality of these discussions across specific cultures and industries.

Finally, future research on communication across work and life domains should also look more closely at the roles of, and communication with, supervisors in alleviating employees' work-life conflict associated with use of ICTs for after-hours work. Employees' propensity to engage in communication about their family domain with the supervisor is likely to depend on several factors related to their relationship with the supervisor (Straub, 2012) (as with communicating with family about their work demands; Ramarajan & Reid, 2013). Many supervisors may not be supportive about employees' concerns about the effects of extended connectivity through smartphone use on their private spheres; furthermore, regardless of such concerns, employees may still value increased work connectivity (Cavazotte et al., 2014; Mazmanian et al., 2013). Indeed, much communication with supervisors about the use of mobile communication in general may take the form of informal and latent expectations and demands for after-hours connectivity, and negotiations about control over the uses of the technology (Stephens, 2018). Ramarajan and Reid (2013) show that such discussions, with either supervisors or family, could also worsen work-life conflict and organizational identification, and that some topics cannot or should not be shared. This might be dependent on the extent to which these discussions generate support as opposed to highlight tensions or frictions between domain demands.

Overall, the findings demonstrate the importance of supervisors in engaging in boundary spanning communication about the possible effects of using ICTs (specifically, smartphones) for after-hours work, as these communicative acts may reduce work-life conflict and facilitate identification processes.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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