Information and Communication Technology Use and Work-Life Balance: The Effect of Constant Availability from a National and Cross-Cultural Perspective

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Abstract/ Zusammenfassung

This dissertation deals with the role of Information and Communication Technology (ICT) for the work-life balance, wellbeing and recovery of employees. Three research studies contribute to the work and organizational psychology literature on the work-home interface and on technology use. The first study provides a taxonomy of affective ICT events and examines their distinct relations to employee recovery. Regarding this relationship, the second study provides evidence for the moderating effect of different facets of organizational expectations regarding availability. The third study expands the scope to a cross-cultural context, examining cultural differences between German and Chinese employees regarding the notion of work-life balance as well as regarding ICT use after hours and the respective effects on wellbeing.

Diese Dissertation beschäftigt sich mit der Rolle von Informations- und Kommunikationstechnologien (IKT) für die Work-Life Balance, das Wohlbefinden und die Erholung von Arbeitnehmenden. Drei Forschungsarbeiten liefern einen Beitrag zur arbeits- und organisationspsychologischen Literatur bezüglich der Schnittstelle zwischen Arbeits- und Privatleben. Die erste Studie legt eine Taxonomie affektier IKT-Ereignisse vor und untersucht deren jeweiligen Zusammenhang mit der Erholung von Arbeitnehmenden. In Bezug auf diesen Zusammenhang liefert die zweite Studie Hinweise für einen moderierenden Effekt durch unterschiedliche Facetten von organisationalen Erreichbarkeits-erwartungen. In der dritten Studie wird der Blick auf die interkulturelle Ebene ausgeweitet. Es werden kulturelle Unterschiede zwischen deutschen und chinesischen Arbeitnehmenden in Bezug auf ihre Vorstellungen von Work-Life Balance sowie ihre IKT-Nutzung und entsprechende Auswirkungen auf das Wohlbefinden untersucht.

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List of Abbreviations

ICT ..... Information and Communication Technology

WHC ..... Work-home conflict

WINT ..... Work-related ICT use during non-work time

WLB ..... Work-life balance

1. Introduction

> *"I am on a well-needed holiday and will be back in office August 8. Under this time period I will not check my mail regularly as I am doing my homework on the concept of boundary control. Have a great summer."*

I received this out-of-office notification on the 20th of July when I was requesting a research paper from a fellow researcher whom I found to have similar research areas: we were both interested in the interplay between work and private life, in the role of technology use as well as those widespread expectations to be constantly available. Reading this out-of-office notification, I was happy that our joint research effort had an effect – at least on ourselves, who deal with these questions every day. I was disappointed: I received a reply only one day later.

This is a minor example for a major challenge we all have to deal with in the 21st century. Advances in technology have changed the way we work and the way we live our lives. The use of Information and Communication Technology (ICT) has become ubiquitous at work and nonstandard work arrangements that include evenings and weekend have increased (Härmä, 2006). More and more employees get at least parts of their job done away from their traditional office (Hill, Ferris, & Märtinson, 2003). Mobile devices enable employees to be constantly connected to work, which in turn is associated with an increased "always-on mentality" (Park, Fritz, & Jex, 2011) and expectations from organizations regarding employee availability at work as well as after work (Barber & Santuzzi, 2015; Derks & Bakker, 2014). Thus, the flexibility to stay connected to work is extended to the evening hours (Diaz, Chiaburu, Zimmerman, & Boswell, 2012) and physical and mental barriers between life domains are fading away (Dén-Nagy, 2014).

Companies increasingly become aware of potential downsides of flexible work arrangements and constant availability, resulting in a wide spectrum of approaches and solutions. In Germany, for example, some companies have implemented policies limiting the use of smartphones for work purposes in the evening hours or during holidays. German politicians have also discussed an "anti-stress-law", aiming at the same limitations in order to preserve employee health (Huggler, 2014).

During the last years, researchers in the fields of work and organizational as well as occupational health psychology have increasingly invested in examining contemporary challenges in the interface between life domains, antecedents of and obstacles to a satisfactory employee work-life balance, as well as the respective role of technology. There is evidence that ICT use may be both beneficial as well as detrimental with regard to work-life balance, employee wellbeing and recovery. Thus, ICT use has been characterized as a double-edged sword for employees (Day, Scott, & Kelloway,

2010; Derks & Bakker, 2010; Diaz et al., 2012; Middleton & Cukier, 2006). On the one hand, the use of technical devices facilitates work processes and enhances performance. It allows access to information, increases flexibility and efficiency, and enhances communication and collaboration (Day et al., 2010; Diaz et al., 2012). However, ICT use also entails particular risks for employees. Intense technology use is associated with information, work, and social overload (Demerouti, Derks, ten Brummelhuis, & Bakker, 2014). The opportunity to be constantly connected to work together with increased expectations to be "always-on" means that many employees suffer from blurred boundaries and an increasing conflict between work and private life. The use of ICT for work purposes during private time, though aiming at an increased productivity, efficiency or flexibility, may on the contrary affect employee wellbeing and recovery (Boswell & Olson-Buchanan, 2007; Diaz et al., 2012; Park et al., 2011).

1.1 The use of Information and Communication Technology (ICT): A Double-Edged Sword for Wellbeing and Recovery

This character of ICT use as a double-edged sword can be viewed within the framework of the Job-Demands-Resources Model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). According to this model, job demands are related to stress, whereas resources are related to employee engagement and motivation. ICT use may be both: While it is meant to be a resource that aids employees to achieve their goals and decrease job demands such as time pressure, it often acts as a demand with its respective physiological and psychological costs instead (Day et al., 2010; Ďuranová & Ohly, 2016). Many empirical studies have – explicitly or implicitly – drawn on this demand-resource perspective when examining the potential consequences of ICT use. For example, Day et al. (2010) applied the JD-R model to their theoretical framework of ICT demands and resources. Derks and Bakker (2010) provide an overview showing which aspects of email communication in particular can be considered as demands and resources.

Many studies focus on the demanding character, examining potential negative consequences or side effects of ICT use at work as well as across life domains. They show how the use of technology is associated to "technostress" (Brod, 1984), which is defined as a "negative psychological state associated with the use (and abuse) of technology as well as the threat of technology use in the future" (Salanova, Llorens, & Ventura, 2014, p. 88). There is empirical evidence how ICT use as a stressor may lead to negative consequences such as psychosomatic problems, anxiety or lower performance (Ayyagari, Grover, & Purvis, 2011; Salanova et al., 2014; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan,

2007; Thomée, Eklöf, Gustafsson, Nilsson, & Hagberg, 2007). More recently and more specifically related to mobile devices, Barber and Santuzzi (2015) introduced the concept of "telepressure" as the combination of preoccupation and urge to immediately respond to work-related ICT messages. In their research, they show how telepressure as one important side effect of technology use is linked to burnout, absenteeism and sleep quality.

The role of ICT as a means of communication between life domains has been addressed within the framework of boundary theory. Ashforth, Kreiner, and Fugate (2000) focus on daily role transitions between work and private life and introduce the role segmentation-integration continuum as an influential approach in examining the work-life interface. Boundary theory provides a helpful framework to understand how ICT use may cause daily role blurring and conflict between the work and home domain. Several studies have examined the life-domain crossing consequences of the use of mobile technologies: For example, Chesley (2005) showed that the use of mobile devices is linked to negative spillover, distress and lower family satisfaction. Derks and Bakker (2010, 2014) show how frequent or intensive smartphone use is associated to higher levels of work-home interferences and may lead to higher stress and lower employee satisfaction. Also Heijstra and Rafnsdottir (2010) provide evidence for an increased work-family conflict through ICT use.

Recently, research interest in the specific case of work-related technology use during non-work time has increased, providing first evidence for the potential detrimental effects of this specific type of supplemental work (e.g., Arlinghaus & Nachreiner, 2013, 2014; Boswell & Olson-Buchanan, 2007; Diaz et al., 2012; Derks, van Mierlo, & Schmitz, 2014; Fenner & Renn, 2010; Park et al., 2011). Those studies show how ICT being used for work-purposes during non-work time may be a factor aggravating the conflict between work and private life and impeding on wellbeing and recovery. Ďuranová and Ohly (2016) provide an overview of empirical evidence and develop a comprehensive framework of ICT use for work purposes after hours.

As conceptual counterpart of demands, resources are characterized as means to avoid, hinder, or deal with stressors (Demerouti et al., 2001), thus enhancing wellbeing and recovery (Ďuranová & Ohly, 2016). ICT use may act as a resource in three ways: it may have direct positive effects on wellbeing and recovery, it may unfold indirect effects by reducing potential stressors or it may buffer the stressor-strain association (see Ďuranová & Ohly, 2016). Middleton (2007) shows that Blackberry users appreciate the possibility to work anywhere, anytime, that they feel more efficient and that their mobile phones help them control and manage their work environments. Mazmanian, Yates, and Orlikowski (2006) point out that mobile phones offer individual opportunities such as monitoring the communication flow and controlling message receipt. In addition, ICT may increase

flexibility (Cavazotte, Lemos, & Villadsen, 2014; Heijstra & Rafnsdottir, 2010) and the users' sense of autonomy (Cavazotte et al., 2014) and it allows for more control over interactions (Mazmanian, Orlikowski, & Yates, 2013). There is also empirical evidence that ICT may decrease work-family conflict (Park & Jex, 2011) and may enhance work satisfaction (Diaz et al., 2012). In addition, autonomously motivated ICT use in the evening is positively related to recovery, psychological detachment and positive affect (Ohly & Latour, 2014).

The ambiguity of both positive and negative sides of ICT use is the reason for rising calls to examine under which specific conditions ICT use is beneficial or harmful (Day et al., 2010; Demerouti et al., 2014; Korunka & Hoonakker, 2014). So far, there is only initial evidence for factors that may determine or influence consequences of ICT use on wellbeing and recovery. Several studies examine which general technology characteristics (such as intrusiveness) are primarily responsible for causing stress (i.e, Ayyagari et al., 2011; Day, Paquet, Scott, & Hambley, 2012). In addition, several factors have been found to be relevant on an individual level: the effects of ICT use during non-work time depend on an individual's preference regarding the segmentation or integration of life domains (Butts, Becker, & Boswell, 2015; Sayah, 2013), on goal setting and prioritization skills (Fenner & Renn, 2010) as well as motivational factors (Ohly & Latour, 2014). Focusing on job characteristics, Dettmers, Bamberg, and Seffzek (2016) examine the role of different characteristics of extended availability (i.e. frequency, control or predictability of job contacts). Boswell and Olson-Buchanan (2007) show the moderating role of the employee's position, whereas Glavin and Schieman (2012) describe the moderating effect of several job demands and resources (schedule control, decision-making latitude, job pressures). On the organizational level, implicit availability norms as well as norms about the integration and segmentation of life domains have been found to be influential (Derks, van Duin, Tims, & Bakker, 2015; Derks et al., 2014).

Taken together, the use of ICT can be beneficial for employees, but also comes with certain different pitfalls and dangers for employees, particularly in terms of wellbeing and recovery. With regard to the quickly changing and increasingly digitalized working environment, it seems more important than ever to further investigate the consequences of ICT use for employees from different perspectives.

1.2 Purpose of this Dissertation and Research Questions

This dissertation aims at contributing to the existent literature on the role of ICT use for employee wellbeing and work-life balance. The goal is, on the one hand, to concretize and differentiate previous results (e.g., in terms of the operationalization of ICT use as well as health-related outcomes), and, on the other hand, to broaden the perspective and considering context factors on the individual, organizational as well as cross-cultural level. These goals will be further elaborated in the following sections.

The first goal is to bring two perspectives together that are commonly considered separately, namely the role of ICT at work as well as the ICT use in the form of life domain crossing communication. Focusing on only one of these areas implicates neglecting potential dependencies and does not allow for conclusions regarding the relative importance of ICT-related phenomena. First steps towards a more holistic view on the topic have been taken by Day et al. (2010, 2012). Based on the Job-Demands-Resources Model (Bakker & Demerouti, 2007), they examine the impact of specific ICT demands and supports on employee strain, incorporating both life domains in their theoretical framework. This dissertation aims at further differentiating in which situations throughout an employee's day these demands and supports become salient. The first study (Study 1A) addresses this research question with the development of an ICT event taxonomy based on qualitative data gained in a diary study. The focus is on the subjective perspective of individual employees, which also addresses another research gap. The individual evaluation of ICT use is only rarely considered, even though there is evidence that, for example, employees might evaluate the same amount of ICT use very differently depending on the specific purpose or the circumstances of use (e.g., Frissen, 2000; Mazmanian et al., 2013). Therefore, Study 1A follows the call to take individual evaluations into account (Day et al., 2012; Day et al., 2010; Derks & Bakker, 2010; Frissen, 2000; Wajcman & Rose, 2011). The focus on the subjective perspective of employees with a qualitative approach helps to examine which facets or variants of ICT use actually get salient and relevant in employees' daily work and private life.

With the development of an event taxonomy, this dissertation also answers the call to further differentiate the concept of ICT use as a predictor of health-related outcomes (Butts et al., 2015, Dén-Nagy, 2014, 2014; Ďuranová & Ohly, 2016). Many studies are cross-sectional in design and focus on general ICT characteristics. Thereby, daily fluctuations as well as the specific purpose of ICT use together with situational conditions and context factors are not sufficiently taken into account. In our

first study, we[1] contribute to research by applying an event-based approach, looking at specific ICT-related events. Thus, context factors and the specific purpose of ICT use together with variations in the course of the day are taken into account (see also Butts et al., 2015). In Study 1B, we aim at extending previous research that has examined the effects of ICT use after hours on employee recovery. Many studies operationalize ICT use solely by the intensity or frequency of use (cf. Dén-Nagy, 2014; Ďuranová & Ohly, 2016) and examine if a higher intensity of frequency of ICT for work purposes at home is related to negative outcomes such as an impaired recovery (Derks et al., 2014) or work-family conflict (Fenner & Renn, 2010). Thus, we take advantage of our event taxonomy from Study 1A for examining the effects of specific events that involve work-related ICT use after hours on employee recovery, considering the psychological detachment from work in the evening as well as sleep quality. In Study 2, we further elaborate our results by examining how ICT events are related to the daily level of work-home conflict. Secondly, we allow for a further differentiation of the relationship between ICT use after hours and recovery by introducing a more objective measure of ICT use. We assess the total time spent on work-related ICT use after hours each day, as for example suggested by Derks et al. (2014), and its association to detachment from work as well a work-home conflict.

However, the main purpose of Study 2 is to shed further light on conditional factors that affect the relationship between ICT use and recovery or wellbeing. Previous studies offer initial evidence for a crucial role of organizational norms and expectations for ICT use behavior as well as its consequences on health-related outcomes (e.g., Derks et al., 2015; Derks et al., 2014; Kreiner, 2006; Park et al., 2011). Building on those findings, we examine the relevance of three facets of organizational expectations regarding work-related ICT use after hours, namely:

- **ICT Availability Expectations** (Day et al., 2012): the expectation to be available for work during non-work time.
- **ICT Response Expectations** (Day et al., 2012): the expectation to respond to work-messages during non-work time.
- **Organizational Time Demands** (Thompson, Beauvais, & Lyness, 1999): the expectation to sacrifice time for work during non-work time.

[1] Parts of this dissertation were developed in cooperation with research partners (for more details regarding the specific contribution in each study see Chapter “Publication Status and Scope of Responsibility”). In order to avoid inconsistencies in style due to different personal pronouns, the plural will be used throughout the three studies of this dissertation.

In Study 2, we examine how those organizations expectations moderate the relationship between ICT events and detachment from work as well as work-home conflict. In Study 3, we expand our perspective beyond the German context and consider cross-cultural issues. Previous studies have suggested that differences in cultural values and practices in the interface between the work and home domains are likely to occur (Ollier-Malaterre, Valcour, Den Dulk, & Kossek, 2013; Powell, Francesco, & Ling, 2009). Initial research effort has been undertaken to examine potential differences between Western and Asian cultures (e.g., Aryee, Fields, & Luk, 1999; Hassan, Dollard, & Winefield, 2010; Lu, Gilmour, Kao, & Huang, 2006; Yang, Chen, Choi, & Zou, 2000). The goal of Study 3 is to examine potential cultural differences between Germany and China in the work-home interface as well as in the prevalence and consequences of work-related ICT use after hours. We want to extend previous findings by examining how the work and home domain are being viewed and handled in Germany and China and by analyzing if ICT use behavior patterns and its consequences on wellbeing that have been found in Western cultures can be applied to the Chinese context accordingly.

In summary, this dissertation project addresses the following key research questions:

- Which ICT-related positive or negative events (affective events) are experienced and relevant on a day-to-day basis in the work and personal life of knowledge workers? (Study 1A)

- Which of the event clusters that involve work-related ICT use after hours are detrimental or beneficial for employee detachment and sleep (Study 1B)? Which of them increase the sense of work-home conflict (Study 2)?

- Is a longer duration of work-related ICT use after hours related to a lower detachment from work and a higher work-home conflict? (Study 2)

- Is there an influence of perceived organizational expectations on the relationship between ICT use and detachment or work-home conflict? (Study 2)

- Do cultural differences exist between German and Chinese employees regarding the notion of work-life balance, the use of technology after hours and the respective effects on wellbeing? (Study 3)

Thus, this dissertation addresses the role of ICT use on three different levels: on an individual level with a focus on individually evaluated events and daily fluctuations of ICT and health effects, on an organizational level with a focus on organizational norms and expectations, and on a cultural level with a focus on cultural differences between Germany and China. Figure 1 illustrates the three levels of

research and shows where each study is located. Three studies were conducted and will be briefly summarized in the following section.

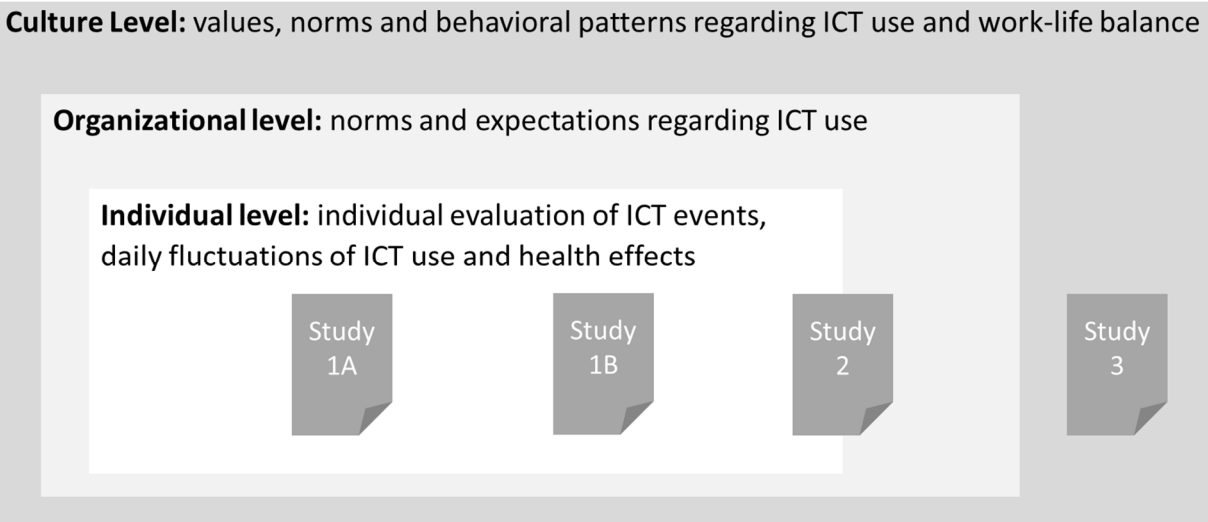

Figure 1. Research Focus on an Individual, Organizational and Cultural Level

1.3 Summary of the Studies Compiled in this Dissertation

1.3.1 Study 1: Identifying ICT-Related Affective Events Across Life Domains and Examining Their Unique Relationships with Employee Recovery

The purpose of the first study was to investigate the role of Information and Communication Technology (ICT) use for employees by exploring affective ICT events and their relation to employee recovery. We conducted two daily diary studies with employed knowledge workers. In Study 1A (N=153), we followed a qualitative approach by developing a taxonomy of negative and positive ICT events at work and at home. We conceptualized ICT events as affective events (Weiss & Cropanzano, 1996) and applied the concept mapping approach for data analysis (Jackson & Trochim, 2002; Kane & Trochim, 2007). We found eleven negative ICT event clusters (e.g., multichannel use, work emails in the evening) and ten positive ICT events (e.g., utilizing idle times, availability at home).

In Study 1B (N= 154), we examined how the occurrence of those ICT event clusters that involve working in the evening is related to detachment from work and sleep quality using a multi-level design. Our results provided a differentiated picture of relationships between ICT events occurring in the evening and recovery. Overall, results indicate that work-related ICT events in the evening – even in cases where they are appraised as positive – are detrimental for recovery. Our study contributes to the refinement of the operationalization of ICT use for future analyses of ICT impacts

and sheds light on the effects of different forms of ICT use. ICT use conceptualized as affective events helps to advance our understanding of the diversity of ICT-related experiences. The negative effects of work emails at home in particular imply that organizations should engage in optimizing their "email culture".

1.3.2 Study 2: ICT Use After Hours, Work-Home Conflict and Detachment from Work – the Role of Perceived Organizational Expectations

In Study 2, we examined the role of organizations expectations as potential moderators of the relationship between work-related ICT use after hours and wellbeing. We based our analyses on the data that we gathered in Study 1B, drawing on the diary responses of N= 145 knowledge workers. We found further evidence for the potential detrimental effects of work-related ICT use during non-work time for employee recovery. More specifically, we found that the duration of ICT use at a given day predicted a lower detachment in the evening, but was not related to the level of work-home conflict. In addition, we did not find any of the ICT-events from Study 1B that are related to work during non-work time (*Work Emails, Work Calls and Continuing Tasks*) to predict work-home conflict beyond our control variables. In terms of the role of organizational expectations, we found that when ICT response expectations or organizational time demands are high, the event *Work Emails* is more strongly related to WHC as compared to when those expectations are low. This suggests that while ICT-mediated work at home itself may not be detrimental in that it increases WHC, this effect is present for work emails when the person is expected to reply instantly and to sacrifice private time for work. For detachment, we found similar interaction effects for work emails and, in addition, the relationship between work calls and detachment was moderated by ICT availability expectations. Our additional analysis further suggests that employees who perceive strong ICT availability expectations and organizational time demands, also experience more daily WHC. This further highlights the importance of organizational expectations.

With those results, we extend previous studies by differentiating ICT use beyond its subjective intensity, considering the duration of ICT use during non-work time as well as different ICT-related events. We also shift perspective from a descriptive approach of organizational norms (e.g., Kreiner, 2006) towards prescriptive norms and organizational expectations (Cialdini, Kallgren, & Reno, 1991). We add to previous literature by expanding the perspective from response expectations (Derks et al., 2015) to a more comprehensive understanding of organizational norms also including organizational expectations regarding availability and time sacrifices at home. We show how these

expectations influence the effects that ICT use after hours may have on employee recovery as well as the perceived interference between work and private life on a daily level. Our results suggest that companies should be aware of – and address – organizational norms and expectations regarding ICT use that may have unfavorable direct or indirect effects on employee recovery and wellbeing.

1.3.3 Study 3: Work-related ICT Use During Non-Work Time and Work-Life Balance – a Comparative Study in Germany and China

In Study 3, we used a cross-cultural, comparative approach to examine work-related ICT use after hours and work-life balance in the German and Chinese working context. We conducted a parallel cross-sectional study in both countries, questioning employees in the German (N = 159) and Chinese (N =199) banking sector. We examined cultural differences in the segmentation/ integration of life domains, in ICT use and boundary management tactics as well as in the effects of ICT use on wellbeing.

We found that Chinese participants reported higher frequencies of ICT use after hours and used more integration-related BMT, but that at the same time they indicated higher levels of segmentation preference and actual segmentation. The relationship between ICT use and wellbeing was in part culture-specific: we found on the one hand that those forms of ICT use that were related to intrusions of work contacts into private life seem to be more detrimental for Germans than for Chinese. On the other hand, those forms of ICT use that did not involve communication with others were related to more severe consequences in the Chinese sample. We discuss different potential explanations such as individualistic or collectivistic cultural values or the culture-specific role of flexible work arrangements and telework. Our results are limited as many of our multi-items scales show poor measurement invariance. Nevertheless, our results contribute to previous research, showing the importance to distinguish cognitive, motivational and behavioral aspects of work-home interference. In addition, we were able to offer initial evidence regarding cultural specifics in the area of ICT use patterns and boundary management tactics, building a starting point for future cross-cultural research on the work-home interface.

To sum it up, the three studies of this dissertation aim at shedding further light at the prevalence, forms and consequences of ICT use related to the interface between life domains. The research further aims at providing a clearer picture of factors that determine if ICT use is beneficial or detrimental for employee wellbeing and recovery.

2. Study 1: Identifying ICT-Related Affective Events Across Life Domains and Examining Their Unique Relationships with Employee Recovery

2.1 Introduction

The use of Information and Communication Technology (ICT) has become ubiquitous at work. An increasing number of employees spend a great amount of working time using ICT such as personal computers, smartphones, and tablets (Wajcman & Rose, 2011). The use of technical devices facilitates work processes as it may allow greater access to information, increase flexibility and efficiency, enhance communication and collaboration and thus may contribute to better work performance (Day et al., 2010; Diaz et al., 2012). However, ICT use also entails particular risks for employees. For example, intense ICT use is associated with information, work, and social overload (Demerouti et al., 2014). In addition, mobile devices enable employees to be constantly connected to work, which in turn is associated with an increased "always-on mentality" (Park et al., 2011) and organizational expectations regarding employee availability during non-work hours (Barber & Santuzzi, 2015; Derks & Bakker, 2014). In consequence, physical and mental barriers between life domains are fading away (Dén-Nagy, 2014) and the conflict between work and personal life increases (Boswell & Olson-Buchanan, 2007; Diaz et al., 2012). Accordingly, previous research has suggested that ICT use may impair wellbeing and, in particular, impede on recovery processes (Barber & Jenkins, 2014; Derks et al., 2014; Park et al., 2011).

ICT use may therefore be characterized as a double-edged sword for employees (Day et al., 2010; Diaz et al., 2012) that, on the one hand, may support processes in all life domains, but, on the other hand, may also act as a stressor and hinder recovery from work. This ambiguity is the reason for rising calls to examine the conditions under which ICT use is beneficial or harmful for employee wellbeing (Day et al., 2012; Demerouti et al., 2014; Korunka & Hoonakker, 2014). While there is already an array of studies investigating the role of moderators on the individual, job, or organizational level (e.g., Boswell & Olson-Buchanan, 2007; Demerouti et al., 2014; Fenner & Renn, 2010), we currently know very little about the specific situations that are associated with beneficial or detrimental consequences of ICT use (Ďuranová & Ohly, 2016). Initial evidence points at the importance of considering context and content of ICT use (Butts et al., 2015) and taking event-based fluctuations into account (Ganster & Rosen, 2013). Thus, breaking down ICT use into specific events occurring on a daily basis may provide a more comprehensive and detailed picture of varying effects of ICT use on daily wellbeing outcomes.

The purpose of this work is to examine a) in which specific situations ICT use is perceived as beneficial or detrimental and b) how ICT-related events outside of regular working hours are related to indicators of employee recovery. We conducted two diary studies among knowledge workers, for whom ICT plays an important role (Wajcman & Rose, 2011). We aim to contribute to the existing ICT literature by applying an event-based approach: in Study 1A, we identify ICT-related events that employees encounter in the course of the day and that they appraise as beneficial or detrimental (Lazarus & Folkman, 1984). We develop a taxonomy of affective ICT events, applying the concept mapping approach (Jackson & Trochim, 2002). We contribute to the literature on ICT use and wellbeing by identifying specific negative and positive ICT events on a day-to-day basis. Compared to traditional research on ICT use, an event perspective extends the common feature-oriented research by examining specific happenings bound in time and place. This way, it becomes possible to trace the dynamics of specific effects, to reduce retrospective biases, and to study short-term consequences for individual wellbeing (Ganster & Rosen, 2013; Morgeson, Mitchell, & Liu, 2015).

In Study 1B, we analyze the short-term effects of ICT events in the evening on employee recovery. Recovering, i.e., unwinding and recuperating from work during leisure time (Sonnentag & Fritz, 2007), is crucial for employee wellbeing and health (Geurts & Sonnentag, 2006) and empirical evidence suggests that work-related ICT use in particular impairs recovery processes (for an overview see Ďuranová & Ohly, 2016). For instance, research suggests that ICT use might impair psychological detachment and sleep quality (e.g., Barber & Jenkins, 2014; Lanaj, Johnson, & Barnes, 2014; Park et al., 2011). In our study, we examine potential effects of ICT-related events outside working hours on recovery indicators.

2.1.1 The Relationship Between ICT Use, Wellbeing, and Recovery

Many studies provide evidence for detrimental consequences of ICT use such as technostress, psychosomatic complaints, anxiety, or low job performance (e.g., Salanova et al., 2014; Tarafdar et al., 2007). The potential downsides of life domain crossing ICT use are addressed within the frameworks of work-family border theory (Clark, 2000) and boundary theory (Ashforth et al., 2000). Both theories contribute to our understanding of how ICT use may cause daily role blurring and conflict between the work and home domain. Several studies have shown how ICT use affects other life domains by leading to negative spillover, increased stress, and lower work satisfaction (e.g., Chesley, 2005; Derks & Bakker, 2014). In addition, ICT use for work purposes during non-work time may aggravate the conflict between work and personal life and impair employee wellbeing and

recovery (e.g., Arlinghaus & Nachreiner, 2013; Boswell & Olson-Buchanan, 2007; Diaz et al., 2012; Park et al., 2011). The few studies on positive consequences of ICT use suggest that it may – at least subjectively – increase efficiency, flexibility, and the sense of autonomy (Cavazotte et al., 2014; Middleton, 2007).

2.1.2 ICT-Related Affective Events and Individual Appraisal

Most studies that examine the consequences of ICT use on wellbeing or recovery either focus on general ICT characteristics or operationalize ICT use solely by intensity or frequency of use (cf. Dén-Nagy, 2014; Ďuranová & Ohly, 2016). This feature-oriented perspective does not account for potentially unique attributes of ICT-related experiences that determine the effects on employee wellbeing (Butts et al., 2015). According to event system theory (Morgeson et al., 2015), an event-oriented approach may extend the usual feature- and process-oriented perspectives in organizational research. Event-based accounts are less subject to retrospective biases and have been proven appropriate for assessing short-term effects of stressors on wellbeing and recovery (Ganster & Rosen, 2013).

According to Weiss and Cropanzano (1996), an event is "a happening, especially an important happening", "something that occurs in a certain place during a particular time" and that involves a "change in circumstances" (p. 31). In our study, we focus on everyday work events as we expect that those everyday events are particularly relevant for employee wellbeing (Sinclair et al., 2015). Specifically, we define ICT events as discrete happenings involving ICT use, thereby explicitly including everyday workplace occurrences. We argue that breaking down ICT use into discrete events helps identify in which situations specific characteristics (e.g., technology features) become salient and meaningful and may allow for a more differentiated prediction of the effects of ICT use on recovery.

Affective events theory (Weiss & Cropanzano, 1996) and cognitive appraisal theories (Lazarus, 1991; Scherer, 2001) provide useful frameworks to further define the relevance and potential impacts of ICT-related events. Both of these theories assume that the emotional reaction to an event depends on the individual's cognitive appraisal. The core assumption of cognitive appraisal theories is that in a first appraisal process, a person detects whether an event is relevant (and congruent) to his or her goals, thus, leading to an evaluation of the event as beneficial or harmful (Lazarus, 1991; Scherer, 2001). From a stress theory perspective, those primary appraisal processes define if a given event will act as a stressor or not (Lazarus & Folkman, 1984). Furthermore, the affective state elicited

by the appraisal of an event is related to attitudes, satisfaction, and subsequent behavior (Weiss & Cropanzano, 1996)(Weiss & Cropanzano, 1996). Thus, it depends in part on the person's appraisal if ICT events result in negative consequences (Day et al., 2012; Day et al., 2010; Derks & Bakker, 2010).

2.1.3 Overall Study Approach

Our study followed a two-step mixed-method approach to combine exploratory methods with the testing of hypotheses regarding the effects of ICT-related events on indicators of recovery (Creswell & Plano-Clark, 2007; Edmondson & McManus, 2007). We used qualitative data for gaining an in-depth understanding of ICT-related affective events from the participant's perspective, complemented by quantitative data for the further examination of the frequency of occurrence of evening events and their further effects on recovery (Lee, Mitchell, & Sablynski, 1999). We extend previous cross-sectional research on ICT use by applying a diary study design in order to investigate within-person relationships between daily perceived events and recovery (Butts et al., 2015; Ohly, Sonnentag, Niessen, & Zapf, 2010). Thus, we were able to assess recovery in its natural context close to the event in order to examine the immediate effects (Derks et al., 2014). In addition, this approach allowed for potential lagged effects in the course of the day.

2.2 Study 1A: Development of the Event Taxonomy

Study 1A aimed at extending previous research regarding positive or negative experiences of ICT use. We followed an inductive approach to examine which specific ICT events are relevant on a day-to-day basis and appraised as detrimental or beneficial by employees (Lazarus & Folkman, 1984; Lee et al., 1999). The focus was on the differential role of ICT at work as compared to during non-work time (Day et al., 2010; Korunka & Hoonakker, 2014). The main research question of Study 1A was: which positive or enriching as well as negative or detrimental ICT-related affective events do knowledge workers experience during and after work?

2.2.1 Data Collection and Measures

We collected data within the framework of a larger scale research project. Participants were knowledge workers from a wide range of industries and professions. We recruited employees working in different companies throughout Germany. In total, 165 employees initially agreed to take part. They were requested to fill in a general online questionnaire as well as three daily questionnaires (T1 in the morning, T2 after work, T3 before going to bed)[2] over the course of seven consecutive working days. Overall, 153 persons provided daily survey data and were included in this study (response rate 92%). Of all 139 participants who provided demographic information in the general questionnaire, 57.6% were female. Mean age was 37.3 years (*SD* = 9.9). In terms of family status, 31.1% were single, 42.4% married, 22.7% living together with a partner and 3.8% divorced. 43.9% of participants had children. Participants came from different sectors (23.8% service business, 18.5% IT and media, 17.7% industry, 13.1% consulting and 26.9% from different other sectors). 62.8% of participants had a leadership position. Mean professional experience was 14.8 years (*SD* = 10.8), mean working time per day were 8.8 hours (*SD* = 1.3). Participants worked on average 3.6 hours per day from home (*SD* = 6.4).

For the assessment of daily affective ICT events, participants reported twice a day if they encountered positive or negative ICT-related events: at T2 (after work between 3 pm and 8 pm with regard to working time) and at T3 (before going to bed between 9 pm and 1 am with regard to after working time). Cognitive appraisal theories suggest that an event needs to be appraised as beneficial or harmful (positive or negative) in the primary appraisal process in order to be worth reporting at all (Ellsworth & Scherer, 2003; Lazarus, 1991). Therefore, at both data points the first question was: “Were

[2] Only data from T2 and T3 were included in this study.

there any situations today [T2]/after work [T3] which were related to the use of ICT (PC, Smartphone, Tablet) and which you evaluate as being negative or stressful?" (see also Ohly & Schmitt, 2015). We used the same question to ask for positive or enriching events (see Appendix 1). In the second step, participants were instructed to briefly describe the situation in an open question format: "Please describe the situation: where have you been (location, presence of others)? What were your perceptions and thoughts?" Thus, participants had the opportunity to further elaborate the situation's appraisal beyond "positive" or "negative". In total, participants reported 234 negative events (145 at T2; 89 at T3) and 371 positive events (224 at T2; 147 at T3). All reported events are listed in Appendix 2. The total number of observations was 717 at T2 and 683 at T3. All items in this study were processed in German.

2.2.2 Strategy of Data Analysis

The purpose of our qualitative analysis of the reported ICT events was to provide a taxonomy of event clusters which reflects the most relevant affective ICT event types that employees consider to be beneficial or harmful. We applied the concept mapping approach (Jackson & Trochim, 2002; Kane & Trochim, 2007), a "hybrid between traditional content analysis and semantic mapping analysis" (Behfar, Peterson, Mannix, & Trochim, 2008, p. 174). We chose this method instead of traditional, researcher driven content analysis because we were interested in how knowledge workers themselves perceive and categorize ICT-related events. In order to avoid the problem of researchers imposing their own subjective interpretation on the data, the original participants and people with a similar professional background are chosen to categorize the statements in the form of a card sorting task (Jackson & Trochim, 2002). By statistically aggregating the individual judgements of different sorters, a high level of reliability may be reached (Jackson & Trochim, 2002). Accordingly, we followed the steps recommended by the authors (see also Behfar et al., 2008; Ohly & Schmitt, 2015).

We excluded events that were not related to ICT use, leaving 346 positive and 220 negative events for further analyses. We chose a random sample of 70 positive and 70 negative ICT events for the card sorting task (Ohly & Schmitt, 2015). Twelve independent sorters grouped the positive events, 13 other sorters grouped the negative events according to event similarity and labelled each card pile. Following the approach by Jackson and Trochim (2002, p. 315), we relied on study participants as well as "proxy sorters" to conduct the sorting task. Four sorters were original study participants, ten were university employees and eleven were students with work experience in organizations. Sorters' individual judgements were then analyzed with the concept mapping tools CardZort to re-enact the 25

manually conducted sortings and CardCluster to conduct a cluster analysis on the data (Toro, 2001). As we were interested in specific and subtle differences of events, we chose the complete linkage method which is suitable for producing a larger number of tightly related groups (Courage & Baxter, 2005). The algorithm groups statements together into clusters by ensuring that dissimilar items are grouped in different clusters in a stepwise way. In the first step, all statements represent their own clusters, whereas in the last configuration, all statements are grouped into one large cluster. Based on the resulting distance matrices and the visualization in the form of dendograms, the researcher has to decide which level of clustering to employ, balancing the informational values derived from a given solution with consideration of sample size and parsimony (Jackson & Trochim, 2002, p. 316; see also Behfar et al., 2008; Ohly & Schmitt, 2015). We decided on a final cluster solution of ten positive and eleven negative meaningful clusters and reverted to the sorters' cluster labels for defining the final cluster names.

In order to also capture event prevalence, we extended the regular concept mapping process by coding all reported events along our event taxonomy (binary variables: event reported or not). In order to ensure the reliability of the coding, we determined interrater agreement. For the analysis, another random sample of 80 positive and 80 negative events was chosen and coded independently by two researchers. There was substantial agreement between the two researchers' judgements with $\kappa = .80$ for the negative events and $\kappa = .77$ for the positive events (Landis & Koch, 1977).

2.2.3 Results

We came up with a final cluster solution which covers ten positive and eleven negative event clusters, displayed in Table 1. The table contains cluster labels, representative statements, and frequencies of occurrence. The event clusters will be further defined and elaborated in the following section.

Table 1. Event Taxonomy: Description and Frequencies of Event Clusters

No.	Cluster Name	Representative Statement [a]	Freq. [b]
Negative Workday ICT Events			
N1	Disruption Meeting	Urgent call/email during a meeting. Stress, impoliteness to the colleagues.	10.00
N2	Disruption Workflow	Calls on my smartphone have continually disrupted my workflow in the office.	5.91
N3	Communication Overload	Emails, emails, emails – it just went on and on the whole day.	9.09
N4	Technical Problems	Breakdown of telephone systems, so I wasn't reachable in the office.	20.45
N5	Multi-Channel-Use	The usage of Lync, thereby communicating via different channels in parallel.	5.00
N6	Private Disturbance	Private messages distracted me from work.	3.64
N7	Being On-Call While Absent	During a seminar I regularly checked my mails, worried that sth. wouldn't work during my absence	2.27
N8	Disturbance on the Way	Important call with customer from the car, which reduced my attention to the traffic.	5.45
Negative Evening ICT Events			
N9	Continuing Work Tasks (NEG)	At home, I had to work off leftover to-dos.	13.64
N10	Work Calls at Home	My mobile rang while I was preparing dinner, while spending time with my kids…	11.36
N11	Work Emails at Home	Emails in the evening with the expectation to reply immediately, regular mail check.	13.18
Positive Workday ICT Events			
P1	Multitasking Meeting	Even though I was in a meeting, I could check my emails.	4.34
P2	Information Accessing	I quickly found helpful data in the internet to prepare a project draft.	5.78
P3	Coordination	Complex coordination of appointments.	8.09
P4	Work Facilitation	Fast and efficient communication channels.	19.65
P5	Personal Affairs at Work	It is essential that I can reach my child anytime and anywhere when I am in the office.	6.65
P6	Availability Absence	During a meeting I was still available, I could' miss anything and I was up-to-date	8.09
P7	Utilizing Idle Times	I could read my emails on my way to the office.	8.96
Positive Evening ICT Events			
P8	Continuing Work Tasks (POS)	I could finish something at home without having to be in the office.	7.51
P9	Availability at Home	Because I was available, I could help a colleague out.	12.72
P10	Personal Affairs at Home	Exchange with my friends via What's App.	18.21

Notes. [a] For the sake of conciseness, short statements were chosen as exemplary events.
[b] Freq: Relative frequencies in percent based on the total number of positive (n=346)/ negative (n=220) events.

2.2.3.1 Negative ICT events

In the cluster *Technical Problems*, which is defined as a work impediment or delay caused by technical failure, lack of connectivity, poor reception, or a lack of data access, 20.5% of all negative ICT events were subsumed. *Disruption Meeting* (10.0%) refers to situations where the employee is disrupted during a meeting or phone call by incoming calls, messages, or memos. *Disruption Workflow* (5.9%) incorporates the same type of interruptions occurring during the regular workflow at work or when working at home. *Communication Overload* (9.1%) contains situations where the study participants perceived a high ICT-mediated workload, usually in the form of incoming emails. Also related to information overload is the event cluster *Multichannel Use* (5.0%), which is defined as the simultaneous use of multiple communication channels or devices. *Disturbance on the Way* (5.5%) refers to disruptions by work calls or messages while being on the way home in the train or car, or during a break. Another event cluster describes situations of *Being On-Call* (2.3%) during business trips, seminars, breaks, or meetings.

The remaining four clusters are related to the interference between life domains. Only 3.6% of all negative events were categorized as *Private Disturbances* during work-time. Three other events involve the interferences of work with personal life and together account for more than 38% of all negative events. *Continuing Work Tasks* (13.6%) involves strain by pursuing or finishing work tasks outside working hours (e.g., postprocessing/preparation of work day). *Work Calls* (11.4%) is defined as a disruption by incoming work calls during private time. *Work Emails* (13.2%) means a disruption by (urgent) incoming work emails during private time.

2.2.3.2 Positive ICT events

Participants' statements were subsumed in ten positive event clusters. Of all events, 19.7% were characterized as *Work Facilitation* with the help of ICT, including quick problem solving, work organization, or multi-channel-availability. *Information Accessing* (5.8%) encompasses events in which our participants report the benefits of quick and easy information access and updates via ICT, particularly while absent (business trip, travelling). *Coordination* (8.1%) contains situations of a productive exchange and inter-connected work with others via ICT. Thirdly, *Multitasking Meeting* (4.3%) is defined as ICT-mediated correspondence or information research during a meeting or phone call. *Availability Absence* (8.1%) encompasses situations where the participants subjectively gain from being available via ICT while travelling, working from home, or during breaks. Related to this,

participants appreciate *Utilizing Idle Times* (9.0%) while travelling or waiting by working via ICT. Also, participants report positive events in which they deal with *Private Affairs at Work* (6.7%). This cluster incorporates situations where the employees handle private matters such as calls, emails, or personal research via ICT during working time. On the other hand, also *Availability during Private Time* for work contacts was seen as a positive event (12.7%). *Continuing Work Tasks* (POS)[3] (7.5%) shows how participants appreciate continuing or finishing left-over tasks or preparing the upcoming working day outside working hours. Finally, the cluster *Personal Affairs* (18.2%) incorporates all events in which the participants handle personal matters via ICT during private time.

2.2.4 Discussion Study 1A

Study 1A revealed eleven negative and ten positive ICT event categories. Some of the aspects that emerged from our event taxonomy have been addressed in the existent literature (e.g., Day et al., 2012; Demerouti et al., 2014). We add to this literature by showing which of the general features of ICT use translate to concrete day-to-day events and how they are being evaluated by employees.

The event clusters *Communication Overload* and *Multichannel Use* reflect the relevance of ICT-mediated overload which has been related to negative consequences in previous research (Dabbish & Kraut, 2006; Day et al., 2012). The cluster *Technical Problems* may be characterized as a disruption of functions or regulation difficulty that potentially acts as a stressor (Frese & Zapf, 1994; Hacker, 2003), similar to the concept of ICT hassles (Day et al., 2012). With more than 20%, technical problems proved to be the most frequently reported negative event and seem to be highly salient to the study participants. The two event clusters *Disruption Meeting* and *Disruption Workflow* involve interruptions, which may have harmful impacts on wellbeing – in particular when accumulated over time (Baethge, Rigotti, & Roe, 2015). *Disturbance on the Way* as another form of interruption, however, may also involve the feeling of role ambiguity (Rizzo, House, & Lirtzman, 1970) to some extent. Being at a different work setting or at the transition between work and private time when being interrupted, employees may have to deal with potentially conflicting demands of two different settings. Our results further suggest that *Being On-Call* should be conceptualized as unique events that have to be distinguished from the event of actually being disturbed. Being on call or being available via

[3] In order to discriminate between the negative and the positive event clusters that are both labelled "Continuing Work Tasks", we will further refer to them as "Continuing Work Tasks (NEG)" (negative event) and "Continuing Work Tasks (POS)" (positive event).

ICT has been defined as an ICT demand that may increase work-family conflict and impair wellbeing (Day et al., 2012).

The following categories encompass the interference between work and personal life. *Private Disturbances* during work-time may be seen as interruptions, and these events often make conflicting demands between one's work and family roles. Thus, disturbances may be associated with feelings of family-to-work conflict, high levels of which are associated with increased work stress (Frone, Russell, & Cooper, 1992). In addition, *Continuing Tasks (NEG), Work Calls*, and *Work Emails* involve the interferences of work with personal life. Previous studies have shown how being contacted outside working hours via phone or email is linked to health problems (e.g., Arlinghaus & Nachreiner, 2013). All three event clusters can be characterized as work-family conflict situations which have been found to be detrimental for employee wellbeing and work-life balance (e.g., Amstad, Meier, Fasel, Elfering, & Semmer, 2011; Frone, Russell, & Cooper, 1997). While *Continuing Work Tasks (NEG)* usually may be characterized as self-initiated and may not necessarily involve immediate communication with others*, Work Calls* and *Work Emails* include being contacted by others. Thereby, *Work Calls* are usually singular, disruptive, rather short-lasting externally triggered events. *Work Emails*, however, often involve a longer period of work and in part also depend on the employees' initiative to check the email account.

The positive event categories reflect situations where knowledge workers perceive ICT use as beneficial, covering *Facilitated Work* to increase productivity or efficiency (Day et al., 2010; Wajcman & Rose, 2011), *Access to Information* as well as opportunities for *Coordination* and exchange (Day et al., 2010, 2012; Wajcman & Rose, 2011). The event cluster *Multitasking Meeting*, however, describes positive situations that have not been covered in previous research and offers a further differentiation of situations were ICT may be perceived as beneficial. The positive event cluster *Availability Absence* may be seen as the antipole to the negative event *Being On-Call*. With being available outside working hours, employees may experience greater flexibility and freedom and value the benefits of high ICT control (Day et al., 2010; Mazmanian et al., 2013). This is also reflected in the event *Utilizing Idle Times*, which also touches the positive ICT features of accessibility and availability (Day et al., 2010), but more specifically emphasizes the efficient use of "worthless" time periods.

Personal Affairs at Work may again be seen as the antipole of the negative event *Private Disturbances at work*, showing that the intrusion of personal affairs at work may be positive or negative. In our study, the positive cluster occurred more frequently (see Table 1). Also within the framework of family-to work spillover, these situations have been shown to be perceived rather positive than negative from the employees' perspective (e.g., Kirchmeyer, 1992; van Steenbergen,

Kluwer, & Karney, 2014). The organization's perspective may differ from that of the employee: framed as cyberslacking, negative consequences for the organization become apparent (e.g., Vitak, Crouse, & LaRose, 2011).

The event taxonomy also contains positive situations in which work interferes with personal life. Within the event cluster *Availability during Private Time*, participants reported events where they felt benefits from being available for urgent work matters via ICT, demonstrating how the control over ICT may act as a resource to personal life (Day et al., 2010). Also, positive work news was often seen as beneficial rather than a negative disruption (sample statement: "I received good news regarding order fulfillment."). These situations may be seen as a specific form of positive work-to-family spillover (e.g., Grzywacz & Marks, 2000). Research has shown how connectivity outside working hours may have positive but also negative effects (Diaz et al., 2012; MacCormick, Dery, & Kolb, 2012; Middleton, 2007) which is reflected in our study with both negative and positive events related to availability during private time. Similarly, the positive event category *Continuing Work Tasks (POS)* shows how the possibility to accomplish work at home may help to coordinate work and personal life (sample statement: "I was able to handle something at home without having to be in the office. My son was with me then."). This also reflects the role of ICT control as a helpful resource (Day et al., 2010). The two latter clusters also show how ICT may be actively used for Boundary Management (Sayah, 2013).

Overall, our study contributes to previous research with a systematization of situations where ICT use is perceived as beneficial or detrimental (see also general discussion). Our results further show that the occurrence of an (at first neutral) ICT-related event may turn into an affective event of either positive or negative valence depending on the person's appraisal, reflecting the ambivalent character of ICT as a double-edged sword. This ambiguity was particularly visible in those event clusters occurring in the evening. Thus, Study 1B was designed to take a closer look at those evening events that involve the interference of work-related ICT use with private time and examine effects of employee recovery: Is the appraisal of an event as positive or negative reflected in the employee's subsequent recovery processes?

2.3 Study 1B: The Relationship Between ICT Events and Employee Recovery

Based on the results of Study 1A, we conducted a second diary study to further examine the role of specific affective ICT events occurring in the evening for employee recovery. While Study 1A was only able to provide evidence on the nature and frequency of affective events, the goal of Study 1B was to analyze potential effects of affective events on indicators of recovery as a first validation of our event taxonomy. Specifically, we examine detachment as one core experience of recovery (Sonnentag & Fritz, 2015) and sleep quality as an outcome of recovery in the evening (Demerouti, Bakker, Geurts, & Taris, 2009). Psychological detachment from work refers to "the individual's sense of being away from the work situation" (Etzion, Eden, & Lapidot, 1998, p. 579). Previous studies showed how boundary crossing ICT use impedes employees' psychological detachment from work (Barber & Jenkins, 2014; Derks et al., 2014; Ohly & Latour, 2014; Park et al., 2011). In the framework of our study, we expected employees to be less able to detach from work when experiencing negative evening ICT events that are related to work:

Hypothesis 1: The occurrence of negative evening ICT events is related to lower detachment from work.

In addition, recent studies have linked late-night ICT use to sleep (Barber & Jenkins, 2014; Lanaj et al., 2014) and showed that work-family conflict is related to lower sleep quantity and quality (Crain et al., 2014). Sleep quality as the overall evaluation of the sufficiency of sleep as well as the difficulty initiating or maintaining sleep at night (Crain et al., 2014) seems to be particularly influenced by ICT use compared to sleep quantity (Barber & Jenkins, 2014). Thus, we expected that employees who deal with negative work-related ICT events in the evening are more likely to suffer from impaired sleep in the following night.

Hypothesis 2: The occurrence of negative evening ICT events is related to lower sleep quality.

Our event taxonomy from Study 1A also offers positive affective events related to ICT use after hours. Theory and some initial evidence suggests that ICT use after hours may have positive effects: It allows for flexibility (Middleton & Cukier, 2006) and it may be an opportunity to better balance work and personal life (Day et al., 2010). Also, getting unfinished work tasks done at home may subsequently help employees to better detach from work (Ohly & Latour, 2014), which in turn is conducive for sleep (Barber & Jenkins, 2014). In line with this argument, Syrek and Antoni (2014) showed that unfinished tasks were associated with higher levels of rumination in the evening – the opposite of detachment – and lower sleep quality. Therefore, we expected that the positive experience

of finishing tasks by being available or pursuing work-related issues in the evening would facilitate subsequent recovery processes:

Hypothesis 3: The occurrence of positive evening ICT events is related to higher detachment from work.

Hypothesis 4: The occurrence of positive evening ICT events is related to higher sleep quality.

2.3.1 Data Collection and Measures

In total, 181 knowledge workers from different industries initially agreed to participate in the study. Participants filled in a general questionnaire as well as daily questionnaires during eight consecutive days. Overall, 154 persons provided daily survey data and were included in this study (response rate 85%). During workdays, they filled in three questionnaires: in the morning, after work, and before going to bed. On the weekend, participants filled in only two questionnaires: One in the morning and one before going to bed. With the daily questionnaires, we assessed ICT events as well as indicators of employee recovery. Ďuranová and Ohly (2016) suggest that the effects of ICT use should not only be measured directly after usage (as the immediate emotional reaction), but they hypothesize potential sustained effects on wellbeing and recovery throughout the day. In our study design, the immediate emotional reaction was indirectly assessed categorizing the event as either "positive" or "negative". We further examined medium-term effects later in the day on indicators of employee recovery measured before bedtime and in the next morning.

For this study, we only used data provided on workdays, leading to 538 observations at T1, 669 at T2 and 515 at T3. 50.0% of our participants were female. Mean age was 36.56 years (*SD* = 10.9). In terms of family status, 34.9% were single, 34.9% were married, 24.7% were living together with a partner, and 5.5% were divorced. Only 16.4% of this sample had children. Participants came from different sectors (23.0% chemistry and pharmacy, 14.2% industry, 11.5% service industry, 10.8% trading and marketing, 10.1% banks and insurances, and 20.3% from different other sectors). 55.5% of all participants had a leadership position. Mean professional experience was 15.0 years (*SD* = 11.2), mean working time per day was 8.9 hours (*SD* = 1.1).

Positive and negative evening ICT events: Our approach in Study 1A was limited as we were only able to consider events that participants actively reported within the open-question-format. It is possible that more events occurred, but were not recalled or reported. Thus, in order to provide a

more objective picture of the distribution of the event categories, we developed an event checklist (Reis & Gable, 2000) based on the three negative and two positive events from Study 1A that deal with work-related ICT use in the evening (item list see Appendix 1). Specifically, we assessed *Availability* and *Continuing Work Tasks (POS)* as positive events, and *Work Emails*, *Work Calls*, and *Continuing Work Tasks (NEG)* as negative events. Before going to bed, participants were asked to check the events that had occurred during the evening. In order to avoid ambiguity in event valence and in order to capture only those events that are appraised as meaningful affective events in the primary appraisal process (cf. Ellsworth & Scherer, 2003; Lazarus, 1991), participants were specifically asked only to consider events that they perceived as positive/negative in the first place. Thus, event occurrence in this study does not represent the occurrence of a neutral event, but in line with affective events theory (Weiss & Cropanzano, 1996) includes the appraisal as positive or negative. Sample items are "Today, I had to finish off work tasks during private time (i.e., postprocessing/preparation of work day)" (Negative event *Continuing Work Tasks (NEG)*) or "Today, I was available via ICT for urgent work matters during private time (calls, emails)" (*Positive Event Availability*).

Recovery: To measure indicators of recovery, we relied on established scales. Before going to bed, we assessed the level of detachment from work (Cronbach $\alpha = .92$) with three items from the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007), adapted to the daily level. A sample item is: "Today after work I didn't think about work at all" (5-point Likert scale). In the next morning, we assessed the quality of sleep during the night with a single item adapted from the Pittsburgh Sleep Quality Index (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) ("During the past night, how would you rate your sleep quality overall?" 4-point Likert scale).

Control Variables: There is evidence that time pressure is a strong predictor of detachment (Kinnunen, Feldt, Siltaloppi, & Sonnentag, 2011; Sonnentag & Fritz, 2007; Sonnentag, Kuttler, & Fritz, 2010) as well as other wellbeing and health-related outcomes (e.g., Sonnentag, Mojza, Binnewies, & Scholl, 2008). Also, working hours were shown to be a significant predictor of wellbeing and health (Sparks, Cooper, Fried, & Shirom, 1997). Therefore, in our study we controlled for time pressure, measured by one item of the Instrument for Stress Oriented Task Analysis (ISTA; Semmer, Zapf, & Dunckel, 1995), and the total number of working hours at the respective day. In addition, we controlled for the duration of ICT use in the evening in order to capture the effects of the event's specific nature irrespective of its length.

2.3.2 Strategy of Data Analysis

The data had a two-level structure (days nested within persons). To test our hypotheses, we used hierarchical linear regression analysis (HLM7; Raudenbush & Bryk, 2010). As we were only interested in within-person relationships, all predictor variables were centered around the person-mean (Enders & Tofighi, 2007). For both outcome variables, we entered our control variables in step 1 and each event in a single predictor model in step 2 which were tested against the control model. Means and standard errors of all study variables can be found in Table 2.

2.3.3 Results

Negative ICT Events: Of our control variables, only the duration of ICT use significantly predicted a lower detachment from work. The occurrence of the negative events *Work Emails* and *Continuing Work Tasks (NEG)* predicted a lower detachment from work after controlling for time pressure, working hours, and the duration of ICT use (see Table 3). Thus, on days where employees reported – and evaluated negatively – that they received or had to write work emails or had to continue work tasks, they were less able to detach compared to days where those events did not occur. *Work Calls* was not a significant predictor of detachment. Thus, the level of detachment was not influenced by the occurrence of work calls in the evening. Sleep quality was predicted by *Work Calls* and *Work Emails*, but not by *Continuing Work Tasks (NEG)* (see Table 4). Thus, Hypotheses 1 and 2 were partially supported.

Positive ICT Events: Both positive events were unrelated to sleep quality. Thus, Hypothesis 4 was rejected. In contrast to our expectations, both *Continuing Work Tasks (POS)* as well as *Availability* predicted a lower detachment from work. Thus, on days where employees reported – and evaluated positively – that they were able to continue work tasks or were available for urgent work matters, they were still less able to detach from work. Thus, Hypothesis 3 was rejected.

Table 2. Means, Standard Deviations, and Correlations for Study 1B Variables

Event Cluster	Mean	SD	N	1	2	3	4	5	6	7	8	9
Negative Evening Events												
1. Continuing Work Tasks (N9)	0.28	0.45	501									
2. Work Calls (N10)	0.17	0.38	500	0.36**								
3. Work Emails (N11)	0.28	0.45	502	0.51**	0.52**							
Positive Evening Events												
4. Continuing Work Tasks (P8)	0.37	0.48	502	0.61**	0.29**	0.48**						
5. Availability (P9)	0.42	0.49	504	0.38**	0.42**	0.46**	0.44**					
Dependent Variables												
6. Detachment	3.44	1.29	512	-0.38**	-0.18**	-0.31**	-0.32**	-0.27**				
7. Sleep Quality	2.98	0.66	645	-0.06	-0.14**	-0.17**	-0.08	-0.09	0.21**			
Control variables												
8. Time Pressure	2.75	1.43	611	0.14**	0.00	0.07	0.10*	0.07	-0.19**	-0.12*		
9. Working Hours	8.63	2.50	510	0.18**	0.06	0.12**	0.14**	0.12**	-0.15**	0.05	0.25**	
10. Duration of ICT Use	16.43	42.34	510	0.37**	0.17**	0.29**	0.38**	0.28**	-0.31**	0.02	0.08	0.17**

Notes. *p < .05; **p <.0.01 Correlations represent the daily level.

Table 3. Multilevel Results of the Relationship between Evening ICT Events and Detachment

	Detachment											
	Control Model		Predictor Model 1		Predictor Model 2		Predictor Model 3		Predictor Model 4		Predictor Model 5	
	Est.	*SE*	*Est.*	*SE*	*Est.*	*SE*	*Est.*	*SE*	*Est.*	*SE*	*Est.*	*SE*
Step 1: Control variables												
Intercept	3.514 ***	0.091	3.502***	0.092	3.507***	0.092	3.508***	0.092	3.502***	0.093	3.516***	0.092
Time Pressure	-0.065	0.052	-0.062	0.052	-0.055	0.052	-0.041	0.051	-0.063	0.049	-0.054	0.051
Working Hours	-0.058	0.031	-0.060	0.031	-0.051	0.031	-0.045	0.030	-0.051	0.030	-0.053	0.030
WINT	-0.013***	0.003	-0.012***	0.003	-0.011***	0.003	-0.009***	0.003	-0.009***	0.003	-0.012***	0.003
Step 2: Predictors												
Negative Events												
Work Calls			-0.359	0.209								
Work Emails					-0.531***	0.164						
Contin. Tasks (N)							-0.717***	0.159				
Positive Events												
Contin. Tasks (P)									-0.806***	0.150		
Availability											-0.448**	0.153
min2Log-likelihood	1193.58 (df = 6)		1166.50 (df =7)		1161.90 (df =7)		1150.96 (df =7)		1140.78 (df =7)		1169.83 (df =7)	
χ2 statistic (compared to control model)			27.09*** (df = 1)		31.68*** (df = 1)		42.62*** (df =1)		52.80*** (df =1)		23.75*** (df =1)	

Notes. N (Control Model) = 389 observations nested within 106 individuals. *N* (Predictor Models) = 381observations nested within 105 individuals. Unstandardized coefficients are reported. Standard errors are indicated in parentheses. *** $p < .001$; ** $p < .01$; * = $p. < .05$. Abbreviations: (N) = (NEG), (P) = (POS)

Table 4. Multilevel Results of the Relationship between Evening ICT Events and Sleep Quality

	Sleep Quality											
	Control Model		Predictor Model 1		Predictor Model 2		Predictor Model 3		Predictor Model 4		Predictor Model 5	
	Est.	*SE*	*Est.*	*SE*	*Est.*	*SE*	*Est.*	*SE*	*Est.*	*SE*	*Est.*	*SE*
Step 1: Control variables												
Intercept	3.001***	0.043	2.992***	0.044	2.991***	0.044	2.992***	0.044	2.994***	0.044	2.992***	0.044
Time Pressure	-0.059	0.033	-0.052	0.032	-0.046	0.032	-0.053	0.033	-0.056	0.033	-0.059	0.033
Working Hours	0.000	0.021	-0.006	0.021	0.006	0.021	0.003	0.021	0.000	0.021	0.001	0.021
WINT	-0.001	0.002	0.000	0.002	0.001	0.002	0.000	0.002	0.000	0.002	-0.000	0.002
Step 2: Predictors												
Negative Events												
Work Calls			-0.319**	0.122								
Work Emails					-0.377***	0.101						
Contin. Tasks (N)							-0.161	0.101				
Positive Events												
Contin. Tasks (P)									-0.174	0.100		
Availability											0.017	0.099
min2Log-likelihood	526.17 (df = 6)		509.06 (df =7)		504.90 (df =7)		515.76 (df =7)		511.04 (df =7)		517.18(df =7)	
χ2 statistic (compared to control model)			17.11*** (df = 1)		21.27*** (df = 1)		10.40** (df =1)		15.13*** (df =1)		8.990** (df =1)	

Notes. N (Control Model) = 299 observations nested within 99 individuals. N (Predictor Models) = 294 observations nested within 97 individuals. Unstandardized coefficients are reported. Standard errors are indicated in parentheses. *** p < .001; ** p < .01; * = p < .05. Abbreviations: (N) = (NEG), (P) = (POS)

2.3.4 Discussion Study 1B

The aim of Study 1B was to extend previous research as well as findings from Study 1A by providing a more differentiated picture on the positive and negative consequences of work-related ICT use in the evening on recovery. Results showed that specific positive and negative ICT events in the evening related to detachment from work or sleep quality in the following night. In line with results from Study 1A and our hypotheses for Study 1B, we found detrimental effects for negative evening events, supporting the view that ICT is a life domain crossing demand with the respective detrimental effects (e.g., Boswell & Olson-Buchanan, 2007; Diaz et al., 2012; Fenner & Renn, 2010; Park et al., 2011). More specifically, results suggest that *Work Emails* are both associated with a lower detachment from work as well as a poorer sleep quality in the following night. Detachment from work was further related to *Continuing Work Tasks (NEG)*, but not to *Work Calls*. This may not be explained by time effects, as we controlled for the duration of ICT use in all analyses.

One reason for those distinctive effects may be that work calls as synchronous form of communication may be handled more flexibly, the employee may take an active part in how deeply the work issue is discussed, and gets instant feedback on his own reply. With emails, however, the recipient may not influence which information is being delivered initially and, due to asynchronous communication, will usually not receive an instant reply and continue thinking about the issue. Thus, work emails may be associated with a higher level of rumination, which is characterized by recurrent thoughts about (work-related) issues and considered "not compatible with detachment" (Cropley & Zijlstra, 2011). Similarly, after continuing – and potentially not finishing – work tasks at home the employee might have to further ruminate about work which may explain the association of the cluster *Continuing Work Tasks (NEG)* to detachment. Further studies may take a closer look at how different forms of ICT use in the evening are related to rumination, thereby also considering the difference between affective rumination, which has been linked to negative outcomes, and problem-solving pondering as the beneficial form of rumination (Cropley & Zijlstra, 2011).

There is a different picture for the relationship between negative ICT events and sleep. Results suggest that *Work Calls* and *Work Emails* are related to a poorer sleep quality, while Continuing Work Tasks (NEG) is not. *Work Calls* and *Work Emails* are both intrusive events that are associated with communication to others, while this is not necessarily the case *for Continuing Work Tasks (NEG)*. Communicative intrusions may be conceptualized as interruptions which have been shown to be related to irritation, mediated by time pressure and mental demands (Baethge et al., 2015). This may be associated with a higher level of stress and, thus, impede on the following night's sleep. Future

research should examine different levels of mental demands and perceived time pressure associated to the specific forms of work interruptions in the evening.

In this study, we did not find positive associations of positively evaluated ICT events and recovery. This finding is in line with Lazarus' (1991) argument regarding the strength of negative emotions relative to positive emotions and in line with research on positive-negative asymmetry effects, indicating that negative emotions are more influential for wellbeing-related outcomes (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). On the contrary, results indicated that, despite the characterization of such events as positive, the risk of an impeded recovery seems to prevail, as both *Continuing Work Tasks (POS)* and *Availability* were related to a lower detachment from work. One might think that this is because the occurrence of those positive events is confounded with longer working hours. For example, completing work tasks using ICT takes time which adds up to overtime. The negative consequences of overtime have been shown in various studies (e.g., van der Hulst & Geurts, 2001). Both positive events are indeed significantly correlated to the duration of ICT use. However, both events predicted a lower detachment from work after controlling for the duration of ICT use, so there have to be additional reasons. Employees might not be aware of potential negative consequences and, thus, adhere to a positive evaluation or they might accept negative side effects for the sake of pursuing their professional goals. Another explanation for negative effects of positive events may be drawn from cognitive dissonance theory (Festinger, 1957): employees may evaluate potentially detrimental behavior they exhibit more positively in order to reduce cognitive dissonance (see also Middleton, 2007).

Overall, results show that while employees experienced both positive and negative events (with an even higher prevalence of positive events in both studies), subsequent detrimental effects on recovery prevailed. This supports the perspective of ICT use as a demand resulting in negative consequences for employee wellbeing (Day et al., 2010, 2012; Derks & Bakker, 2010; Ďuranová & Ohly, 2016).

2.4 General Discussion

2.4.1 Theoretical Contribution

In our studies, we followed the rising calls to address the double-edged sword character of ICT use and to examine when exactly ICT use turns into a beneficial or detrimental experience (Day et al., 2010; Demerouti et al., 2014; Korunka & Hoonakker, 2014). In a first step, we identified typical ICT events that occur on a daily basis, underlining the importance of an event-based approach (Morgeson et al., 2015) and daily fluctuation of stressor exposure (Ganster & Rosen, 2013). Our event taxonomy shows how the same ICT-related situation may turn into a positive or negative event, highlighting the additional value of conceptualizing ICT use as affective events (Weiss & Cropanzano, 1996). In the second step, we showed how these specific events relate to employee recovery.

Our findings contribute to the literature on ICT use and occupational health and wellbeing as well as research on the interface between life domains. Our newly developed taxonomy provides a basis for the examination of temporal dynamics of ICT use and respective consequences for employee recovery. Used as a checklist in diary studies, the taxonomy allows for examining the prevalence of ICT-related stressful or enriching events as well as potential fluctuations over time including accumulative effects (Ganster & Rosen, 2013).

The event taxonomy provides a more fine-grained approach of specific ICT events and, given the distinctive effects of different forms of evening ICT use on recovery, contributes to the refinement of the operationalization of ICT use after hours beyond frequency or duration for future analyses of ICT impacts (see also Butts et al., 2015; Dén-Nagy, 2014; Ďuranová & Ohly, 2016). The present study further adds to the ICT literature by showing which of the previously postulated beneficial or harmful ICT characteristics actually occur on a daily basis and are perceived to be relevant for employees. While four of the ICT demands suggested by Day et al. (2012) appear as daily events in our event taxonomy (response expectations, availability, hassles, and workload), our results suggest that it is valuable to differentiate interruptions and hassles depending on the context in which they occur, during meetings, during regular workflow, or on the way. Also, we distinguish between the ICT demand "workload" in terms of the amount of communication (*Communication Overload*) and its nature (*Multichannel Use*), which pose different demands on employees. While communication overload may increase time pressure, multichannel use may distract attention and impair concentration. In terms of evening events, our study further differentiates ICT use during non-work time considering what a person actually does (emails, phone calls, other tasks). Initial evidence for the usefulness of a finer distinction

was provided in Study 1B where work-related emails seem to be more detrimental than other forms of ICT use.

It is interesting to note that ICT learning expectations and employee monitoring, postulated as ICT demands by Day et al. (2012), did not emerge within our taxonomy. This indicates that for the participants of our study, these potentially demanding aspects of ICT use either did not occur on a daily basis, or were not important/salient enough to be mentioned.

One might wonder how certain events fulfill the criteria to be "bounded in time and space" (Morgeson et al., 2015, p. 13) while some of the clusters encompass continuous states (e.g., being on call). A closer examination suggests that these state-like situations are characterized by the anticipation of events. This becomes evident in statements such as: "Availability via email on the smartphone, despite pre-arranged absence I felt pressured to check mails"; "I was in a meeting. As our department was scarcely manned, I constantly checked my phone. Unfortunately, reception was poor. This put me under stress" (N7). The anticipation of events might become stressful in itself. The anticipation may, in particular, be associated with negative outcomes because it leads to rumination (Cropley & Zijlstra, 2011; Syrek & Antoni, 2014). In summary, it seems worthwhile to further explore the nature of such anticipated events and the processes of how they unfold their effects.

Study 1A yielded different kinds of situations where employees experienced their ICT use as beneficial (positive event categories). While the overall prevalence of positive events compared to the prevalence of negative events was higher in both studies, this did not translate to higher levels of recovery. On the contrary, our study showed that also in situations where employees appreciate being available or pursuing work tasks in the evenings their detachment from work suffers. Thus, a positive ICT feature may turn into a negative event, which further confirms the value of considering discrete events rather than general characteristics. These findings extend previous literature by giving empirical evidence for what has been described as "illusions of balance and control" (Middleton, 2007). While employees might appreciate flexibility and control over when and where they work, they often underestimate potential downsides regarding their recovery. However, employees might still be motivated to engage in such detrimental behavior as it may help them to achieve long-term professional goals via goal attainment or task accomplishment (Ohly & Schmitt, 2015).

Our study shows that work-related ICT events in the evening were particularly salient and relevant for employees (Study 1A) and significantly affected recovery (Study 1B). This is in line with border theory (Clark, 2000) as well as boundary theory (Ashforth et al., 2000) which describe that work-related ICT use during non-work time may be detrimental as it is associated with role blurring and a

higher level of work-family conflict. Our results suggest that of all ICT events in the evening, work emails seem to be the most detrimental form, impeding on both detachment and sleep quality. While the importance of emails for work-related stress (Derks & Bakker, 2010) as well as their potentially detrimental effect during non-work time (Butts et al., 2015) have been emphasized before, we add to the literature by providing evidence for a more comprehensive approach in terms of a direct comparison of effects of different forms of ICT use on recovery.

We further contribute to the literature on the interface between work and personal life by differentiating between different events relating to work-home interference, and by specifying in which way work may interfere with personal life. For future research, it might be worthwhile to tap deeper into the question what exactly makes the difference between work calls, work emails, or other ICT-mediated work at home. Time pressure, working hours, and the duration of ICT use after hours do not seem to be the driving factors. Relevant factors may be if ICT use is associated to an intrusion, if it was self-initiated or not, as well as the specific content of messages or calls (see also Butts et al., 2015).

2.4.2 Practical Implications

The events identified in this study and their frequencies of occurrence may raise organizational awareness on how employees feel positively or negatively impacted by ICT. During work, the most frequently occurring negative event was *Technical Problems*, suggesting that the disturbing character of technical malfunctioning should not be underestimated by organizations. Also, our study suggests that extending work to the evening hours together with a constant availability is in many cases detrimental to employees' wellbeing. This means that organizational availability norms should be addressed and excessive ICT use after hours be limited. In this regard, it is important, however, not to enforce strict prohibitions, as this may limit autonomy and lead to a feeling of external control, which has been shown to be detrimental for wellbeing (Ohly & Latour, 2014). Instead of company-wide rules, it might be advisable for team leaders to negotiate transparent guidelines within their teams regarding availability and response times. In addition, our study provides evidence for the necessity to raise awareness among employees regarding possible pitfalls of evening ICT use, a behavior they might appraise as positive.

The negative effects of emails in particular imply that organizations should engage in optimizing their "email culture" e.g., by establishing clear rules, questioning implicit response time expectations and norms, and offering specific email trainings. Negative effects of ICT use after hours

proved to be stronger than positive effects. This suggests that the attenuation of negative consequences by the avoidance of negative events during non-work time should be given priority. However, the opportunities of ICT as a resource should not be neglected. Therefore, for the individual employee, it is advisable to carefully reflect on – and in consequence restrict – one's own usage behavior and decide when availability may be beneficial or detrimental. One solution here might be to deactivate the push function on smartphones in order to decide autonomously when checking emails is actually necessary (see also Ďuranová & Ohly, 2016).

2.4.3 Limitations and Future Research

Our study design followed a mixed-method approach to address our research questions. The participant-centered, qualitative approach in Study 1A proved to be valuable to capture the participants' perspectives on ICT-related events, but also came with some conceptual and methodological challenges. First, not all of the event clusters were on the same level of abstraction. For example, the category *Communication Overload* may also contain situations like *Disruptions during a Meeting*. We decided to adhere to the participant-centered approach in that we follow the sorters' clustering and the subjective descriptions in order to reflect the employees' perspectives and mental models in the best possible way. This approach seemed more important than the rigid construction of selective and distinct event clusters and ideal conceptual equivalence, as it mirrors where participants feel the need to differentiate and where they do not.

Also, results of both Study 1A and Study 1B were limited in that they only considered ICT events that reached level of consciousness with the study participants and were appraised as positive or negative in the first step. In line with cognitive appraisal theory, we assumed that all events had to go through this primary appraisal process to be noteworthy at all (cf. Ohly & Schmitt, 2015). Future research may further elaborate the event taxonomy, also considering subliminal user experiences and habitual behavior (Oulasvirta, Rattenbury, Ma, & Raita, 2012) as well as events that are not pre-determined in their valence. Also, factors leading to a positive or negative appraisal should be further examined. One important cognitive process that determines the situation's valence may be the appraisal of goal congruence (Lazarus, 1991): when personal goals correspond to organizational goals, availability may be seen as beneficial, otherwise it may be perceived as a duty ("being on-call").

In Study 1B, we applied a quantitative approach to investigate the relationships between specific ICT-related events and recovery as experienced in the evening and the next morning. Other

outcome variables and time frames (e.g., recovery on the weekend) might be worthwhile to consider in future studies. In the case of positive ICT experiences in particular, future research could further analyze the role of positive ICT events as a resource by additionally examining the indirect positive effects of such events (reduction of potential stressors, buffering of the stressor-strain association). For the effects of the negative events, it seems worthwhile in future studies to also consider potential mediation effects. For example, it is possible that a lack of detachment mediates the negative effects of ICT use in the evening on sleep quality.

Future research should also consider potential moderator variables. For example, the effects of evening ICT events on employee recovery may depend on a person's general attitude towards technology use as well as their preference to segment or integrate life domains (Butts et al., 2015; Sayah, 2013). It is likely that employees who prefer to segment life domains experience work-related events during evenings as more intrusive and stressful and that "integrators" may profit more from positive events (see also Derks, Bakker, Peters, & van Wingerden, 2016). Also, Oulasvirta et al. (2012) found checking habits to increase the overall technology use, which may result in an increase in the prevalence of certain events found in this study (e.g., *Work Emails*, *Disturbance on the Way*, *Disruption during meeting*).

In addition, it is likely that employees' job type may have affected our results. Future research might examine how often ICT events occur in different jobs, and how they affect recovery and wellbeing, for example, in jobs were there is by definition no clear boundary between private time and work time. In Study 1B we focused on those events from our taxonomy related to ICT use for work during non-work time. Future studies may further examine effects of events during the workday. For example, a diary study recording ICT-related interruptive events may shed further light on accumulative effects of interruptions on wellbeing which have been largely neglected previously (Baethge et al., 2015).

It is possible that the effects we found in Study 1B were also in part inflated by common source biases (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, the fact that not all relationships between ICT events and recovery indicators were significant speaks against this threat. Furthermore, because we assessed factual information (occurrence of ICT events) low in ambiguity and used different rating formats for our dependent and independent variables, we believe that the likelihood of common source bias is low (Podsakoff, MacKenzie, & Podsakoff, 2012). Furthermore, the assessment of sleep quality and ICT events were separated in time, which also reduces common source bias (Podsakoff et al., 2012).

In Study 1B, we concentrated on daily outcomes. In future research, it may be worthwhile to extend this perspective to further examine longer-term effects such as the development of burnout (Day et al., 2012). Whereas we focused on an occupational health perspective, future research should also consider effects of ICT use on individual performance. Particularly in the case of positive events, performance indicators may be more sensitive. For example, positive ICT events may enhance goal attainment or task accomplishment (Ohly & Schmitt, 2015). In our study, these facets were only implicitly covered in the participants' events descriptions (Study 1A) and ratings (Study 1B), but were not included as outcome variables. It is also possible that positive ICT events only unfold positive effects on wellbeing and recovery experiences via goal attainment or task accomplishment. Future studies should consider those indirect effects.

2.4.4 Conclusion

With our mixed-method approach, we provided a fine-grained differentiation of ICT-related daily affective events at work and in the evening, revealing demanding or enriching situations of very different kinds. We showed that different forms of work-related ICT use in the evening had distinctive effects on recovery. Being available for work issues at home, dealing with work emails and work calls as well as continuing tasks in the evening proved to be detrimental for recovery. These effects were found to be largely irrespective of negative – or even positive – individual appraisal. Our results extend literature on the effects of ICT use and contribute to research on the interface between life domains and occupational health.

3. Study 2: ICT Use After Hours, Work-Home Conflict and Detachment from Work – the Role of Perceived Organizational Expectations

3.1 Introduction

Working conditions and working cultures have changed considerably during the last centuries. In particular, the use of Information and Communication Technology (ICT) has become ubiquitous at work and knowledge workers can work anytime and anywhere (Davis, 2002). This comes along with an increased „always on" mentality (Middleton, 2007; Park et al., 2011) as well as rising expectations regarding availability and response times (Davis, 2002; Towers, Duxbury, Higgins, & Thomas, 2006). Those explicit or unspoken expectations raise the likelihood to engage in work-related ICT use during non-work time (Derks & Bakker, 2010; Derks et al., 2014; Fenner & Renn, 2010). On the one hand, technology offers opportunities such as a flexible arrangement of life domains (Cavazotte et al., 2014; Middleton, 2007). On the other hand, a growing body of literature shows the potentially negative effects of work-related ICT use after hours. The feeling of conflict between work and private life increases (e.g., Boswell & Olson-Buchanan, 2007; Diaz et al., 2012) and recovery gets more difficult to achieve (Barber & Jenkins, 2014; Derks et al., 2014; Park et al., 2011).

Boundary theory (Ashforth et al., 2000) is a useful framework to understand the interaction between different life domains. The theory sheds light on how people create and maintain boundaries between their life domains in order to "simplify and classify the world around them" (Derks et al., 2014, p.74). Apart from individual segmentation or integration strategies, the extent to which organizations promote and support clear work–home boundaries is an important factor. In his influential approach of "perceived segmentation norms", Kreiner (2006) describes how organizational norms vary between promoting a separation or integration of life domains. Research suggests that workplace norms that allow for a separation between life domains may help employees to balance work and private life and recover from work when being at home (Park et al., 2011). On the other side, integration norms may increase ICT use (Furst-Holloway, Hollensbe, Masterson, & Sprinkle, 2015) and are associated to higher levels of perceived work-family conflict and a decreased ability to mentally detach from work (Kreiner, 2006; Park et al., 2011).

Apart from those direct effects, there is also initial evidence that organizational norms may act as a moderator influencing the effects that ICT use elicits on employee recovery and wellbeing. Derks et al. (2014) in their diary study find an interaction effect between smartphone use after hours and perceived segmentation norms on detachment from work. In another study, Derks et al. (2015)

examine the role of expectations to respond to messages outside working hours. They find that supervisor expectations, but not expectations of colleagues, moderated the relationship between daily smartphone use and daily work-home interference. They assume that this may be explained by the subjective predominance of the supervisor's influence when both expectations (supervisor's and colleagues') are assessed parallel in the same questionnaire.

Thus, both studies suggest that when a person perceives strong norms to integrate life domains or strong supervisor expectations to be available, smartphone use seems to be more strongly related to negative consequences (lower detachment from work/ higher work-home interference). The latter study, however, only asks participants holding a mobile phone sponsored by the company, leaving out employees using their private devices for work purposes. Due to the increase of "bring your own device" policies (Bello Garba, Armarego, & Murray, 2015), it is questionable if those results can be generalized. In addition, both studies focus on smartphone use, leaving out other devices that may be used for work after hours. Another limitation of both studies is that they operationalize smartphone use only by its perceived intensity. Though this is a relevant variable affecting wellbeing (Derks & Bakker, 2014), the authors admit that "it provides no detailed information about the exact nature or duration of respondents' work-related smartphone use outside of work hours" (Derks et al., 2014, p. 81). Assessing the total time spent on work-related ICT use outside of work hours may help to objectify potentially distorted perceptions of user intensity. Also, Derks et al. (2015) focus on the handling of messages outside of working hours, while other forms of ICT use such as calls or internet research may be carried out and organizational expectations regarding those different forms of work after hours may differ. Our results in Study 1B in this dissertation suggested that depending on the specific ICT-related event (incoming work calls, handling work emails or continuing with work tasks), effects on recovery differ (see Chapter 2.3.4). Thus, also in the present study, an event-based approach was used in order to examine the interaction between different forms of ICT use as well as organizational norms, which helps to consider potentially differing effects depending on the specific nature of ICT use.

Previous studies are also limited regarding the operationalization of organizational norms and expectations. When drawing on Kreiner's (2006) approach (as for example in Derks et al., 2014), researchers operationalize perceived segmentation norms in a descriptive manner, specifying "what other people at my workplace do" (cf. Barber & Santuzzi, 2015). Theories of social norms distinguish two forms of social norms: Descriptive norms "characterize the perception of what most people do" and prescriptive or injunctive norms "characterize the perception of what most people approve or disapprove" (Cialdini et al., 1991, p. 203). In an organizational context, both descriptive as well as injunctive norms are relevant for employee behavior and wellbeing (Cialdini, Bator, & Guadagno,

2013). Injunctive norms in particular guide one's behavior by expected sanctions of others (Reno, Cialdini, & Kallgren, 1993) and are more robust in their impact across situations than descriptive norms (Cialdini et al., 1991). Thus, it seems promising to expand the perspective of descriptive norms by including injunctive organizational norms in the form of other people's expectations and (consciously or unconsciously) expected sanctions.

This prescriptive perspective is also applied by Derks et al. (2015) when examining the role of expectations of the superior as well as colleagues. For the expectations of colleagues, they include behavior-based (descriptive) as well as normative (injunctive) items. However, they only consider expectations regarding responding to messages, while other facets of organizational expectations such as availability for calls (Day et al., 2012) or the expectation to prioritize work over family (organizational time demands, see Thompson et al., 1999) are likely to be important as well.

With this study, we aim to contribute to research on the consequences of technology use after hours on wellbeing and recovery as well as on the role of organizational norms. We add to previous literature by differentiating ICT use beyond its subjective intensity, considering the duration of ICT use during non-work time as well as three ICT-related events that may occur during non-work time, namely *Work Emails*, *Work Calls* and *Continuing Tasks* (see Study 1B) and examine their relationship to employee recovery and wellbeing. Secondly, we shift perspective from a descriptive approach of organizational norms (e.g., Kreiner, 2006) towards prescriptive norms and organizational expectations (Cialdini et al., 1991). We also add to previous literature by expanding the perspective from response expectations (Derks et al., 2015) to a more comprehensive understanding of organizational norms including organizational expectations regarding availability and time sacrifices at home. We examine how these expectations influence the effects that ICT use after hours may have on employee recovery as well as the perceived interference between work and private life on a daily level.

3.1.1 Consequences of Work-Related Information and Communication Technology Use During Non-Work Time (WINT)

There is an increasing amount of research that focuses on the role of ICT as the medium that may foster the intrusion of work into private life. In particular, studies look at antecedents and consequences of work-related ICT use during non-work time (WINT). Depending on the specific focus, WINT has been termed as "work connectivity behavior during non-work time" (Richardson & Benbunan-Fich, 2011), "daily smartphone use after working hours" (Derks et al., 2014), "smartphone use in the evening for work (SUWE)" (Ohly & Latour, 2015), or "technology-assisted supplemental work

(TASW)" (Fenner & Renn, 2010). Ďuranová and Ohly (2016) provide a comprehensive overview of the antecedents and consequences of WINT.

Previous studies have shown how boundary crossing ICT use impedes recovery processes, in particular by hindering employees' psychological detachment from work (Derks et al., 2014; Park et al., 2011) and that, in contrast, clear boundaries between life domains foster detachment (Sonnentag et al., 2010). Psychological detachment from work (short: detachment) thereby refers to "the individual's sense of being away from the work situation" (Etzion et al., 1998, p. 579) and constitutes a core component of recovery from work (Sonnentag & Fritz, 2007). Detachment has been shown to be important for employee wellbeing (Sonnentag & Bayer, 2005; Sonnentag et al., 2010).

Previous studies focused on different indicators of WINT, such as the perceived intensity (e.g., Derks et al., 2014) or frequency of use (ranging from never to always, e.g., Fenner & Renn, 2010). Those measures are limited as they only capture the subjective level of ICT use. An "intensive" or "frequent" use may mean something different from person to person and may depend on internal standards or comparisons to other people. Also, it may be confounded with an evaluative component: people who evaluate WINT as positive, helpful or necessary, may tend to describe their ICT use as less intense or frequent compared to others. Thus, we argue that the actual time spent on WINT is more appropriate for an accurate estimation of detrimental effects on detachment from work. We expect that the longer a person engages in work-related ICT use in the evening, the more he or she is occupied with work-related thoughts and rumination, which is considered "not compatible with detachment" (Cropley & Zijlstra, 2011). In addition, engaging in WINT is likely to be associated with the effort to continue unfinished tasks. Those unfinished tasks have been shown to also be linked to higher levels of rumination in the evening (Syrek & Antoni, 2014). Thus, we expect that the daily duration of WINT is related to the level of detachment the respective evening.

Hypothesis 1a: A longer duration of WINT is related to a lower level of detachment.

Previous studies also provide compelling evidence that WINT is related to a higher level of perceived work-family conflict (e.g., Boswell & Olson-Buchanan, 2007; Derks et al., 2015; Fenner & Renn, 2010). Work-family conflict has been subject to extensive research effort and has been shown to be a key factor when it comes to employee wellbeing and satisfaction (Allen, Herst, Bruck, & Sutton, 2000; Amstad et al., 2011). The construct has been termed differently in previous studies (e.g., work-family conflict or work-life conflict). In our study, we use the term Work-*Home* Conflict (WHC), arguing that "family" as the counterpart to work is too narrow, while "life" is not suitable as a counterpart to "work", as it implies that work is not a part of life. In our opinion, using the word "home" allows to

include a broader range of potential life domains apart from family (see also Kreiner, 2006). WHC is a form of interrole conflict, with the demands of the work role interfering with the demands of family or other personal roles (e.g., Greenhaus & Beutell, 1985; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). WHC models suggest that the amount of time spent in one role (e.g., work) increases the conflict in another role (e.g., family), which has been empirically supported (e.g., Major, Klein, & Ehrhart, 2002). WINT may be conceptualized as one form of overtime and thus, the longer it takes, the stronger the feeling of WHC supposedly becomes. This relationship may even be more likely for WINT as compared to overtime spent at the office, because WINT is associated to an actual blurring of life domains with potential interruptions or intrusions of work contacts any time (Boswell & Olson-Buchanan, 2007). Thus, in our study we expect that the longer the duration of WINT, the more the person's work role will intrude in his or her personal life, leading to a higher work-home conflict.

Hypothesis 1b: A longer duration of WINT is related to a higher level of WHC.

Apart from the duration of technology use, there is evidence that it may be important to consider also context and nature of ICT use (Butts et al., 2015; Derks et al., 2014). In Study 1B, we addressed this issue and examined the relationship between WINT and detachment from work applying an event-based approach. We showed that a differentiation of ICT-related events helped to better predict the effect of ICT use on recovery. We identified *Work Emails*, *Work Calls* and *Continuing Tasks* as the most important events related to WINT and showed how they related to detachment from work (see Chapter 2.3). The event *Work Calls* was not related to detachment, but both *Work Emails* and *Continuing Tasks* predicted a lower detachment from work. In Study 2, we now aim to extend our results from Study 1B by applying an event-based approach also for examining the effects of WINT on WHC. We examine which ICT events are related to the perceived level of WHC on a daily basis. Based on theories of interrole conflict (Greenhaus & Beutell, 1985; Kahn et al., 1964) and previous findings (e.g., Boswell & Olson-Buchanan, 2007; Diaz et al., 2012), we argue that work calls, work emails as well as other ICT-related work tasks performed during non-work time constitute work demands that may interfere with the person's private or family role. We expect that the events *Work Calls* and *Work Emails* are important specific events beyond the mere duration of WINT, because they are both intrusive events associated with communication to others. Those communicative intrusions as one form of interruptions (Baethge et al., 2015) are usually not self-initiated, which may increase the sense of role conflict for the individual concerned. This argumentation does not hold for the event *Continuing Tasks*, which comprises for example the (self-initiated) post-processing or preparation of the work day (see Study 1B) and usually does not involve direct communication to others. Thus, we do not expect that the event *Continuing Tasks* predicts WHC beyond the duration of WINT.

Hypothesis 2: The occurrence of the ICT events *Work Emails* and *Work Calls* during non-work time predict a higher level of WHC beyond the duration of ICT use.

3.1.2 The Role of Organizational Norms and Expectations Regarding ICT Use

There has been put considerable research effort in determining factors that aggravate, prohibit or counteract potential detrimental consequences of WINT. There is an array of studies investigating the role of moderators on an individual, job or organizational level (e.g., Boswell & Olson-Buchanan, 2007; Butts et al., 2015; Derks et al., 2014; Fenner & Renn, 2010). On an organizational level, norms and expectations seem to be a strong factor (e.g., Barber & Santuzzi, 2015).

Organizational norms have been examined from different perspectives, showing how and why those norms emerge and how they affect employee behavior. The emergence of organizational norms and expectations regarding availability has been closely linked to technical advances in the field of mobile communication and the ubiquitous dissemination of such devices (e.g., Mazmanian et al., 2006; Park et al., 2011; Towers et al., 2006). With these new technological options, employees experience strong expectations regarding availability and (short) response times (Davis, 2002; Derks et al., 2015; Fenner & Renn, 2010; Matusik & Mickel, 2011). These norms and expectations significantly influence employee behavior – employees tend to comply with those norms (Fenner & Renn, 2010; Furst-Holloway et al., 2015). Barber and Santuzzi (2015) offer one potential explanation for how norms may affect behavior for the specific case of message response times. They show how organizational norms are linked to a feeling of telepressure, which in turn is related to message response frequency and latency.

Previous studies have investigated organizational norms that are related to the management of life domain boundaries. Many studies base their research on Kreiner's (2006) approach of perceived segmentation norms. As the counterpart of individual segmentation or integration preferences, he distinguishes organizational norms (or supplies) that range between segmentation norms, promoting clear work-home boundaries, and integration norms, promoting permeable work-home boundaries and continuous availability for work. He suggests that a fit between individual segmentation preferences and organizational segmentation supplies is the desirable state. In this respect, ICT plays an important role, as "many jobs now force at least some integration on workers through technologies […], which blurs the boundary between work and home" (Kreiner, 2006, p. 486). He also shows that strong segmentation norms are related to a lower level or work-home conflict. There is also evidence

that the perception of a strong segmentation norm is positively related to a higher psychological detachment after work (Part et al., 2011). Chen, Powell, and Greenhaus (2009) look at the phenomenon also from a person-environment fit perspective and show that individuals experience less work-family conflict when their segmentation preferences are met with the respective supplies at work (segmentation norms).

Those segmentation norms may be framed as descriptive norms that characterize "what most people do". Theories of social norms suggest that injunctive norms, specifying "what most people approve or disapprove" (Cialdini et al., 1991, p. 203), are particularly relevant for predicting behavior "… because they orient individuals away from a concern with how others have behaved in a particular setting and toward a concern with what others approve/disapprove across the culture" (Cialdini et al., 1991, p. 225). Thus, while descriptive norms may be important in the socialization process at work and the adoption of specific work behaviors, injunctive norms in the form of spoken or unspoken expectations of others are likely to be more relevant for the prediction of behavior that expands the actual work setting, i.e. the behavior outside of working hours. Also, while perceived segmentation norms (Kreiner, 2006) may implicitly assume an injunctive character (though conceptualized descriptively), it is possible that employees will not perceive behavior that colleagues exhibit as prescriptive but as something that others do but that does not affect them. Thus, in this study, we aim at conceptualizing organizational norms more explicitly as injunctive or prescriptive norms. The focus is not "what do other people in my organization do?", but rather "what does my organization expect me to do?"

3.1.3 The Moderating Effect of Perceived Organizational Expectations

Previous studies offer first evidence for the role of perceived organizational expectations as a moderator of the relationship between ICT use during non-work time and wellbeing-related outcomes. We aim to expand those results, assuming that it is important to consider three facets of organizational expectations that are likely to be relevant in predicting the potential effects of WINT:

- The expectation to be available for work during non-work time
  (ICT availability expectations)
- The expectation to respond to work-messages during non-work time
  (ICT response expectations)
- The expectation to sacrifice time for work during non-work time
  (organizational time demands)

Day et al. (2012) offer a first helpful distinction of organizational expectations regarding ICT use. Within their framework of ICT demands, they show that employees are faced with the demand to stay *available and connected* ("ICT availability expectations") as well as the demand to *respond* to messages ("ICT Response expectations"), which in their scale development process proved to be two separate factors. Also Barber and Santuzzi (2015) suggest that the urge to respond to messages ("telepressure") is a unique aspect of ICT use beyond being available. Thus, both aspects (availability and response expectations) should be considered separately.

Our event taxonomy in Study 1 suggests that apart from work calls and emails, ICT is also used for continuing other work tasks at home that may not be linked to direct communication with others (event *Continuing Tasks*). In the case of these ICT use situations, a driving factor may be the organizational expectation to sacrifice time for work during non-work time. Thompson et al. (1999) assume and find that organizational expectations to prioritize work above family and taking work home (labelled as "organizational time demands") are an important aspect of an organization's "Work Family Culture" and affect employee behavior. It seems likely that those organizational time demands may be relevant for potentially detrimental effects of WINT (and continuing work tasks at home in particular). Thus, in our study, we take all three facets of organizational expectations (ICT availability expectations, ICT response expectations, organizational time demands) into account.

The moderating effect of those organizational expectations is likely to vary depending on the nature or purpose of ICT use. For example, ICT response expectations explicitly relate to messages, while availability expectations also include contacts via phone. Thus, we expect different interaction effects depending on which ICT-related event from Study 1 occurs (*Work Calls*, *Work Emails* or *Continuing Tasks*). So far, there is little evidence of distinctive effects of organizational norms in the case of emails, calls or other job-related actions during non-work time. Only for the case of emails, initial results are provided: Brown, Duck, and Jimmieson (2014) report that a high proportion of employees experience strong normative response pressures. In their study, those norms are related to emotional exhaustion, and the effect of email ambiguity on emotional exhaustion is moderated by normative response pressures. Their study is, however, not specifically related to emails outside working hours.

In our study, we analyze how ICT availability expectations, ICT response expectations and organizational time demands moderate the effects of ICT events outside working hours on detachment from work and work-home conflict. Similar to the approach applied in Derks et al. (2015), we expect that the negative effects of different forms of ICT use after hours on detachment and WHC will be stronger when organizational expectations to conduct such behavior are high. This means that

employees with strong expectations regarding (ICT-related) additional work after hours are likely to suffer more from such behavior, as they do not decide to do so autonomously but comply with perceived expectations. Self-determination theory (Deci & Ryan, 2000) distinguishes between several types of motivation for doing an activity ranging from controlled motivation to autonomous motivation with different underlying regulatory processes. Complying with organizational norms may be seen as an example of controlled motivation, which includes the two forms of externally and introjected regulation. Externally regulated behavior is controlled by external instrumental consequences, such as rewards or threats of punishments. Introjected regulation means that external standards are partially internalized, in that they are adopted but not (yet) part of one's self (Deci & Ryan, 2000). Organizational norms and expectations to stay available or to respond immediately in the evening may lead to such controlled motivation for ICT use after hours. In this case, external regulation may mean for example that the driving factor for ICT use is the expectation of financial or career-related rewards or the avoidance of disapproval or criticism by colleagues or supervisors. Introjected motivation may occur when a person follows partially internalized norms of the work group without fully identifying with the norm. Ohly and Latour (2014) in their study examine the relationship between autonomous versus controlled motivation for smartphone use in the evening and wellbeing. They find evidence for the assumption that autonomous motivation is positively, while controlled motivation is negatively related to wellbeing. While Ohly and Latour (2014) focus on direct effects, in the present study we expect that when external norms to engage in WINT are strong and ICT use is thus at least in part externally motivated, ICT use will be more strongly related to negative outcomes as compared to when those norms are low or not present.

We expect different moderation effects depending on the respective ICT event involved. More precisely, we expect that ICT availability expectations are relevant for both work calls and emails, as they address availability via both communication channels (Day et al., 2012). We expect that *Work Emails* and *Work Calls* in the evening will be more strongly related to a lower detachment and higher WHC for employees who perceive strong availability expectations from their organization.

Hypothesis 3a: ICT availability expectations moderate the relationship between the occurrence of the ICT event *Work Emails* and WHC.

Hypothesis 3b: ICT availability expectations moderate the relationship between the occurrence of the ICT event *Work Emails* and detachment.

Hypothesis 3c: ICT availability expectations moderate the relationship between the occurrence of the ICT event *Work Calls* and WHC.

Hypothesis 3d: ICT availability expectations moderate the relationship between the occurrence of the ICT event *Work Calls* and detachment.

For work-related emails in particular, in addition to the fact of being available, it is important if an instant response is expected or not. Thus, we hypothesize a moderating effect of ICT response expectations in the case of work-related emails after work: we expect that *Work Emails* will be more strongly related to a lower detachment and higher WHC for employees who perceive strong expectations from their organization to respond immediately.

Hypothesis 4a: ICT response expectations moderate the relationship between the occurrence of the ICT event *Work Emails* and WHC.

Hypothesis 4b: ICT response expectations moderate the relationship between the occurrence of the ICT event *Work Emails* and detachment.

Additional ICT-mediated work after hours does not necessarily include the interaction with others, as given with work emails or work calls. The third event includes continuing tasks at home, for example tasks that could not be finished during the day or that include the preparation of the upcoming day. The focus here is not on availability, but on extended working hours, for example due to a high workload. Thus, organizational norms to continue work at home (organizational time demands) are likely to influence the effects of those events. We expect that the event *Continuing Tasks* is more strongly related to a lower detachment and higher WHC for employees who perceive strong organizational time demands. As *Work Emails* and *Work Calls* also involve additional work after hours, we expect similar interaction effects for those events.

Hypothesis 5a: Organizational time demands moderate the relationship between the occurrence of the ICT events *Work Emails* and WHC.

Hypothesis 5b: Organizational time demands moderate the relationship between the occurrence of the ICT events *Work Emails* and detachment.

Hypothesis 5c: Organizational time demands moderate the relationship between the occurrence of the ICT events *Work Calls* and WHC.

Hypothesis 5d: Organizational time demands moderate the relationship between the occurrence of the ICT events *Work Calls* and detachment.

Hypothesis 5e: Organizational time demands moderate the relationship between the occurrence of the ICT events *Continuing Tasks* and WHC.

Hypothesis 5f: Organizational time demands moderate the relationship between the occurrence of the ICT events *Continuing Tasks* and detachment.

Overall, we aim to extend previous literature that focuses on segmentation norms as descriptive norms by considering injunctive norms in the form of organizational expectations regarding ICT-related work after hours. The goal of our study is to systematically examine the role of the three facets of organizational expectations (ICT availability expectations, ICT response expectations, and organizational time demands) for the effects that WINT exhibits on WHC and detachment from work.

3.2 Method

We used a diary study design in order to investigate within-person relationships between daily ICT use in the form of ICT events and WHC and to further examine the role of organizational expectations at a between-person level (Butts et al., 2015; Ohly et al., 2010). This also brings the advantage that with a separate assessment of variables (ICT use and wellbeing indicators in daily questionnaires, and organizational expectations in a general questionnaire beforehand), a stronger independency of variables may be achieved and thus the likelihood of common source biases be reduced (Podsakoff et al., 2003).

3.2.1 Sample and Procedure

For this study, we conducted further analyses based on the diary data from Study 1B (for further characterization of procedure and sample, see Chapter 2.3.1). We used data of those persons who filled in the general questionnaire (N = 145) and only used daily data from T2 (after work) and T3 (before going to bed).

3.2.2 Measures[4]

3.2.2.1 Daily Measures

Duration of work-related ICT use after hours (WINT duration): We assessed the duration of WINT in minutes with the single item "How long did you use ICT (e.g., Smartphone, Tablet, Laptop, PC) today for work purposes after hours?"

ICT events (*Work Emails, Work Calls, Continuing Tasks):* We differentiated WINT according to the results of our event taxonomy from Study 1A. We assessed three negative ICT event categories (*Work Emails, Work Calls, Continuing Tasks*) with the respective items from the checklist developed in Study 1B (see Appendix 1). A sample items is: "Today, I had to finish off work tasks during private time (i.e. postprocessing/ preparation of work day, email storage)" (event category *Continuing Tasks*).

Detachment: We assessed the daily level of detachment from work with four items from the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007), adapted to the daily level. A sample item is: "Today after work I didn't think about work at all" (5-point Likert scale).

Work-Home Conflict (WHC): We assessed the level of WHC with the interrole conflict scale (Kopelman, Greenhaus, & Connolly, 1983), adapted to the daily level. A sample item is: "Today, my work schedule conflicted with my private life" (5-point Likert scale).

3.2.2.2 Person Level Measures: Perceived Organizational Expectations

ICT response/ availability expectations: They were assessed with respective items from the ICT demand scale (Day et al., 2012). ICT response expectations were assessed with one item ("I am expected to respond to email messages immediately"). ICT availability expectations were assessed with four items ("I am expected to be accessible at all times (e.g., through cell phone/ smartphone)"; "Technology enables people I work with to contact me at any time", "I'm expected to check email when I'm out of the office", "I'm contacted about work-related issues outside of regular work hours").

Organizational time demands: They were assessed with the respective subscale of the Work-Family Culture Scale (Thompson et al., 1999). The items were: "In my organization, employees are

[4] Cronbach 's alpha reliability indices for all multi-items scales are displayed in Table 5.

often expected to take work home at night and/or on weekends.", "In my organization, employees are expected to put their jobs before their families."

3.2.2.3 Control Variables

There is evidence that a high workload and a high time pressure are strong predictors of a lower detachment from work (Kinnunen et al., 2011; Sonnentag & Fritz, 2007; Sonnentag et al., 2010). Similarly, work-home conflict has been shown to be higher when job (and also family) stress is high (Byron, 2005; Ford, Heinen, & Langkamer, 2007). Also for work-home interference, workload is a significant predictor (Derks et al., 2015). Therefore, in our study, we controlled for time pressure, assessed with one item of the Instrument for Stress Oriented Task Analysis (ISTA; Semmer et al., 1995). In addition, participants were asked to indicate their total number working hours during the respective day as a second control variable.

3.2.3 Strategy of Analysis

Our data had a two-level structure (days nested within persons). To test our hypotheses, we used hierarchical linear regression analyses including interaction effects[5] (HLM7; Raudenbush & Bryk, 2010). Predictor variables at the day-level were centered around the person mean, predictor variables at the person-level around the grand mean (Enders & Tofighi, 2007).

3.3 Results

3.3.1 Descriptive Statistics

Table 5 presents the means, standard deviations, and correlations among the study variables. We also calculated the intraclass correlation (ICC) for our day-level outcome variables with 36% of the variance in detachment and 44% in WHC attributable to within-person variations, thus justifying a multilevel approach.

[5] For interaction effects, we followed Yeo and Neal (2004) as well as Snijders and Bosker (2012) with their argumentation that cross-level interaction effects may be interpreted at the level .10.

Table 5. Means, Standard Deviations, and Correlations for Study 2 Variables

Variables	Mean	SD	N	α	1	2	3	4	5	6	7	8	9	10	11
Variables on Level 2															
1. ICT response expectations	3.09	1.13	147	- [1]		.36**	.31**	.23**	.14	.12	-.03	.15	.11	-.16	.25**
2. ICT availability expectations	3.06	1.01	147	.79			.47**	.18*	.20*	.24**	.24**	.28**	.21*	-.23*	.21*
3. Org. time demands	2.54	1.18	147	.71[2]				.00	.07	.10	.06	.01	.13	-.16	.29**
Variables on Level 1															
4. Time pressure (T2)	2.75	1.43	611	- [1]					.21*	.33**	.01	.11	.16	-.18*	.40**
5. WINT (min.) (T3)	16.54	42.34	510	- [1]				.08		.18*	.21*	.38**	.44**	-.26**	.22*
6. Working hours (T3)	8.63	2.50	510	- [1]				.25**	.17**		.11	.12	.23**	-.12	.22*
7. ICT event Work Calls (T3)	0.17	0.38	500	- [1]				.00	.17**	.06		.66**	.55**	-.17	.07
8. ICT event Work Emails (T3)	0.28	0.45	502	- [1]				.07	.29**	.12**	.52**		.67**	-.33**	.20*
9. ICT Event Contin. Tasks (T3)	0.28	0.45	501	- [1]				.14**	.37**	.18**	.36**	.51**		-.42**	.34**
10. Detachment (T3)	3.44	1.29	512	.92				-.19**	-.31**	-.15**	-.18**	-.31**	-.38**		-.51**
11. Work-home conflict (T3)	2.51	1.14	508	.82				.28**	.25**	.35**	.12**	.17**	.26**	-.48**	

Notes. *p < .05; **p < .01. Correlations above the diagonal represent the between-person level (n = 146). In order to calculate between-person correlations, variables were aggregated across occasions. Correlations below the diagonal represent the within-person level (n = 500 (T3), n =611 (T2)). [1] Cronbach α not available in the case of single item measures. [2] Spearman Brown

3.3.2 Testing of Hypotheses

3.3.2.1 The Relationship Between ICT Use After Hours and Detachment/ WHC

As suggested in Hypothesis 1a, WINT duration was a significant predictor of detachment from work (see Table 6): a longer duration of WINT was related to a lower detachment from work. The control variables time pressure and working hours did not predict detachment. Hypothesis 1b, assuming similar effects for WHC as an outcome variable, was rejected, as WINT duration did not predict the level of WHC. For WHC, however, the number of working hours were a significant predictor (see Table 6).

Table 6. Multilevel Results of the Link Between WINT Duration and Detachment/ Work-Home Conflict

	Detachment				**WHC**			
	Control Model		Predictor Model		Control Model		Predictor Model	
	Est.	*SE*	*Est.*	*SE*	*Est.*	*SE*	*Est.*	*SE*
Step 1: Control variables								
Intercept	3.518***	0.091	3.513***	0.091	2.472	0.085	2.472***	0.085
Time pressure	-0.071	0.054	-0.065	0.052	0.058	0.041	0.056	0.041
Working hours	-0.076*	0.032	-0.057	0.031	0.199	0.025	0.194***	0.025
Step 2: Predictor variables								
WINT duration			-0.013***	0.003			0.003	0.002
min2Log-likelihood	1215.05 (df =5)		1193.58 (df =6)		1041.73 (df =5)		1039.58 (df =6)	
χ2 statistic			21.46 (df = 1, p < 0.001)				2.15 (df =1, p = 0.139)	

Notes. N = 387 observations nested within 105 individuals. Unstandardized coefficients are reported.
*** p < .001; ** p < .01; * = p. < .05.

Hypothesis 2 suggests that the occurrence of ICT-related events is related to a higher WHC and that the occurrence of each events predicts WHC beyond our control variables time pressure, working hours and beyond the duration of WINT. However, none of the models with ICT events as predictors showed a significant improvement over the control model (see Table 7). Thus, Hypothesis 2 was rejected.

Table 7. Multilevel Results of the Link Between Negative ICT Events and Work-Home Conflict

	WHC							
	Control Model		Predictor Model: *Work Calls*		Predictor Model: *Work Emails*		Predictor Model: *Finishing Tasks*	
	Est.	*SE*	*Est.*	*SE*	*Est.*	*SE*	*Est.*	*SE*
Step 1: Control variables								
Intercept	2.472***	0.086	2,471***	0.086	2.468***	0.086	2,466***	0.086
Time pressure	0.056	0.041	0.063	0.042	0.061	0.042	0.058	0.042
Working hours	0.194***	0.025	0.193***	0.025	0.196***	0.025	0.193***	0.025
WINT duration	0.003	0.002	0.003	0.002	0.003	0.002	0.002	0.002
Step 2: Predictors ICT events								
Work Calls			-0.029	0.167				
Work Emails					0.030	0.133		
Continuing Tasks							0.097	0.131
min2Log-likelihood	1039.58 (df =6)		1020.65 (df =7)		1027.30 (df =7)		1022.77 (df =7)	
χ2 statistic			12.35 (df = 1, p < 0.001)		12.28 (df = 1, p < 0.001)		16.81 (df =1, p < 0.001)	

Notes. N = 380 observations nested within 105 individuals. Unstandardized coefficients are reported.
*** p < .001; ** p < .01; * = p < .05.

3.3.2.2 Interaction Effects

3.3.2.2.1 ICT Availability Expectations

Hypotheses 3a to 3d suggest a moderating effect of ICT availability expectations on the relationship between ICT events and WHC and detachment. The models testing Hypotheses 3a, 3b and 3c were all not significant. The results for Hypothesis 3d are shown in Table 8. The expected interaction effect was significant at the level 0.10 (see also the argumentation in Chapter 3.2.3 according to Yeo and Neal (2004) as well as Snijders and Bosker (2012)).

Thus, the model examining Hypothesis 3d offers a first evidence in the expected direction. When availability expectations are high, the occurrence of the negative event *Work Calls* is related to a lower detachment as compared to when those expectations are low (see Figure 2). However, the interaction model offers only a small improvement in fit over the predictor model without the interaction effect (Δ-2xlog = 3.38, df =1, p = 0.063).

Table 8. Multilevel Results of the Interaction Between ICT Availability Expectations and Work Calls on Detachment

	Detachment			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	3.499***	0.092	3 .499***	0.092
Time pressure (L1)	-0.062	0.052	-0.054	0.052
Working hours (L1)	-0.061	0.031	-0.063*	0.031
WINT	-0.012***	0.003	-0.011***	0.003
ICT availability expect.	-0.110	0.091	-0.110	0.091
Work Calls	-0.359	0.209	-0.264	0.214
ICT availability expect. x Work Calls			-0.448+	0.243
min2Log-likelihood	1165.04 (df =8)		1161.66 (df =9)	
χ2 statistic			3.38 (df =1, p = 0.063)	

Notes. N = 381 observations nested within 105 individuals. Unstandardized coefficients are reported.
*** p < .001; ** p < .01; * = p < .05.; + = p < .10.

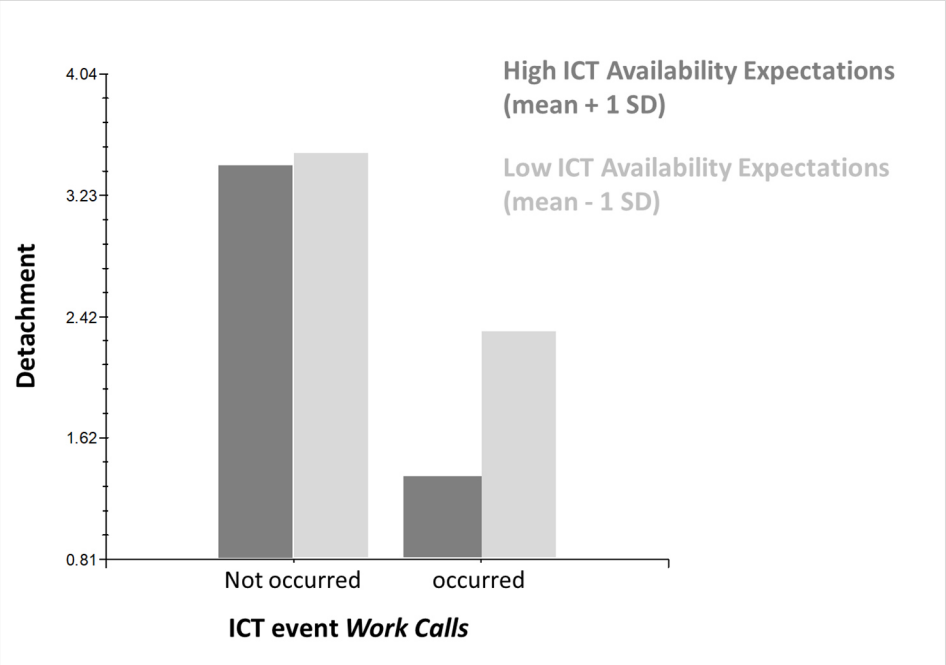

Figure 2. Moderation of ICT Availability Expectations on the Relationship Between Work Calls and Detachment

3.3.2.2.2 ICT Response Expectations

As expected in Hypothesis 4a, there is a significant interaction between ICT response expectations and the event *Work Emails* on WHC (see Table 9). When response expectations are high, the occurrence of the negative event *Work Emails* is related to a stronger increase of WHC as compared to when those expectations are low (see Figure 3). The interaction model offers a significant but small improvement in fit over the predictor model without the interaction effect (Δ-2xlog = 5.60, df =1, p = 0.017).

Table 9. Multilevel Results of the Interaction Between ICT Response Expectations and Work Emails on Work-Home Conflict

	WHC			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	2.479***	0.085	2.480***	0.085
Time pressure (L1)	0.061	0.042	0.055	0.041
Working hours (L1)	0.200***	0.025	0.191***	0.025
WINT	0.003	0.002	0.003	0.002
ICT response expect.	0.124	0.076	0.124	0.076
Work Emails	0.030	0.133	0.067	0.132
ICT response expect. x Work Emails			0.267*	0.112
min2Log-likelihood	1024.68 (df =8)		1019.08 (df =9)	
χ2 statistic			5.60 (df =1, p = 0.017)	

Notes. N = 380 observations nested within 105 individuals. Unstandardized coefficients are reported.
*** p < .001; ** p < .01; * = p < .05.

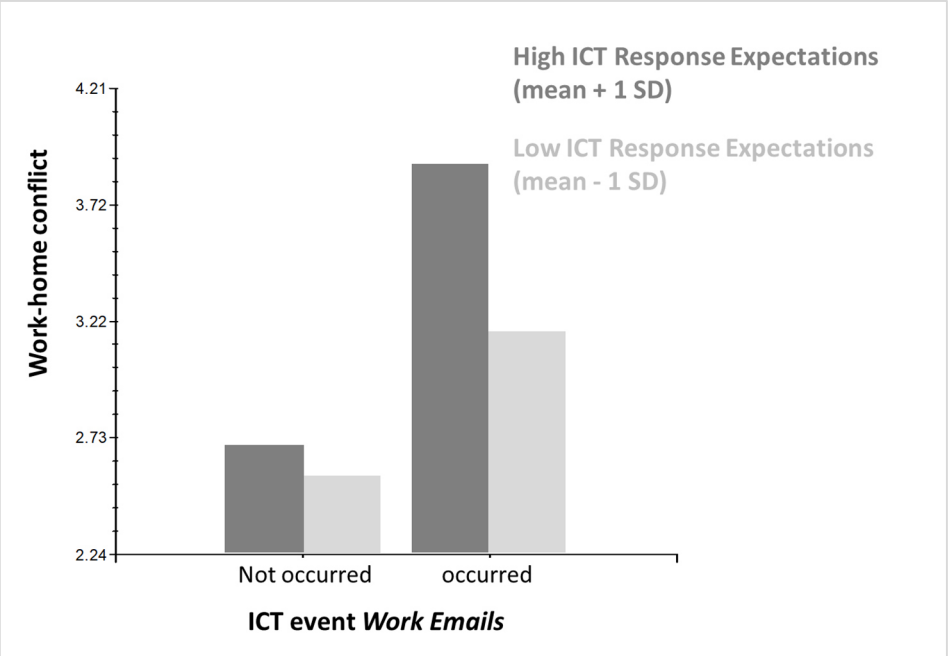

Figure 3. Moderation of ICT Response Expectations on the Relationship Between Work Emails and WHC

The interaction effect expected according to Hypothesis 4b (see Table 10) may be interpreted as significant (Yeo & Neal, 2004; Snijders & Bosker, 2012). When response expectations are high, the occurrence of the negative event *Work Emails* is related to a stronger decrease in detachment as compared to when those expectations are low (see Figure 4). However, also this interaction model only offers a small improvement in fit over the predictor model without the interaction effect (Δ-2xlog = 3.37, df =1, p = 0.063).

Table 10. Multilevel Results of the Interaction Between ICT Response Expectations and Work Emails on Detachment

	Detachment			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	3.497***	0.092	3.496***	0.092
Time pressure (L1)	-0.055	0.051	-0.049	0.051
Working hours (L1)	-0.051	0.031	-0.046	0.031
WINT	-0.011***	0.003	-0.011***	0.003
ICT response expect.	-0.111	0.082	-0.112	0.082
Work Emails	-0.531***	0.164	-0.569***	0.164
ICT response expect. x Work Emails			-0.257+	0.140
min2Log-likelihood	1160.08 (df =8)		1156.70 (df =9)	
χ2 statistic			3.37 (df =1, p = 0.063)	

Notes. N = 381 observations nested within 105 individuals. Unstandardized coefficients are reported.
*** p < .001; ** p < .01; * = p < .05.; + = p < .10.

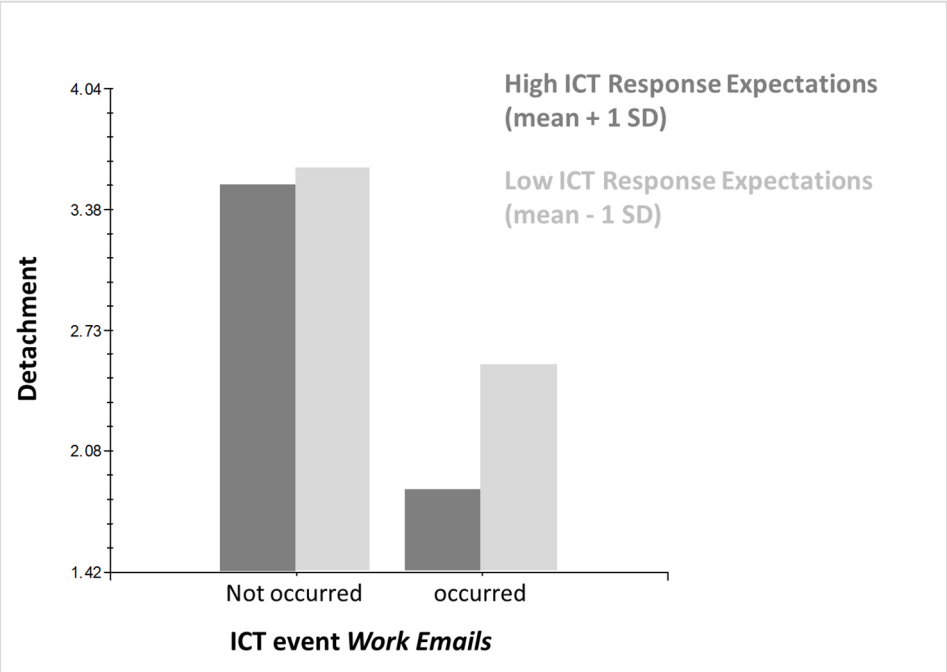

Figure 4. Moderation of ICT Response Expectations on the Relationship Between Work Emails and Detachment.

3.3.2.2.3 Organizational Time Demands

Hypotheses 5a to 5f suggest a moderating effect of organizational time demands on the relationship between ICT events and WHC or detachment. Only in the case of *Work Emails*, significant interaction effects were found. As stated in Hypothesis 5a, there is a significant ($p < .05$) interaction between organizational time demands and the event *Work Emails* on WHC (see Table 11). When organizational time demands are high, the occurrence of the negative event *Work Emails* is related to a stronger increase in WHC as compared to low expectations (see Figure 5). The interaction model offers a significant but small improvement in fit over the predictor model without the interaction effect (Δ-2xlog = 5.14, df =1, p = 0.022).

Table 11. Multilevel Results of the Interaction Between Organizational Time Demands and Work Emails on Work-Home Conflict

	WHC			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	2.472***	0.084	2.473***	0.084
Time pressure (L1)	0.061	0.042	0.057	0.041
Working hours (L1)	0.196***	0.025	0.192***	0.025
WINT	0.003	0.002	0.003	0.025
Org. time demands	0.170*	0.073	0.172	0.073
Work Emails	0.030	0.133	0.143	0.140
Org. time demands x Work Emails			0.294*	0.129
min2Log-likelihood	1021.90 (df = 8)		1016.76 (df = 9)	
χ2 statistic			5.14 (df =1, p = 0.022)	

Notes. N = 380 observations nested within 105 individuals. Unstandardized coefficients are reported.
*** p < .001; ** p < .01; * = p < .05.

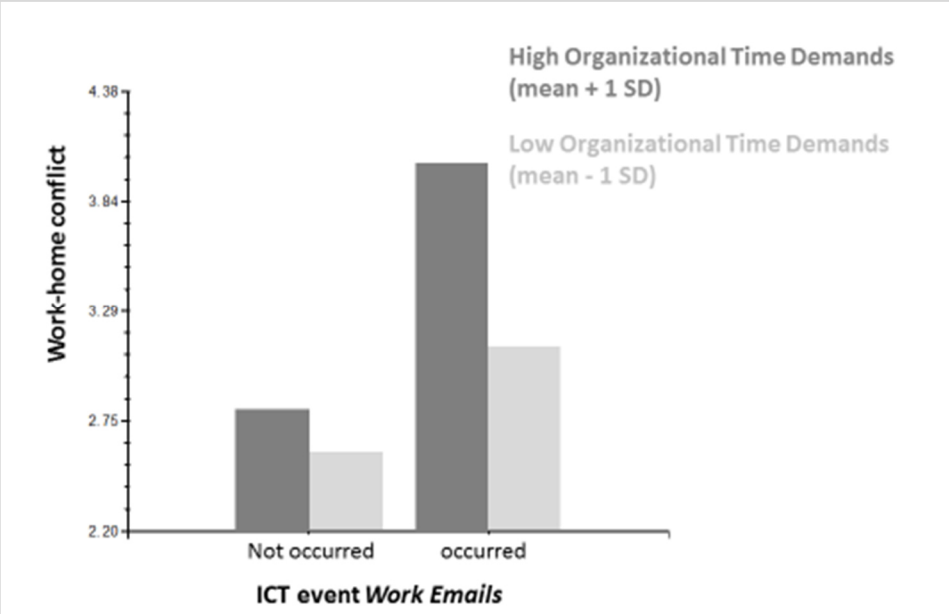

Figure 5. Moderation of Organizational Time Demands on the Relationship Between Work Emails and WHC.

Also with detachment as outcome variable (Hypothesis 5b), there is a significant interaction between organizational time demands and the event *Work Emails* (see Table 12). When organizational time demands are high, the occurrence of the negative event *Work Emails* is related to a stronger decrease in detachment as compared to low expectations (see Figure 6). The interaction model offers a significant but small improvement in fit over the predictor model without the interaction effect (Δ-2xlog = 8.7671, df =1, p = 0.003).

Table 12. Multilevel Results of the Interaction Between Organizational Time Demands and Work Emails on Detachment

	Detachment			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	3.507***	0.093	3.505***	0.093
Time pressure (L1)	-0.055	0.051	-0.049	0.051
Working hours (L1)	-0.051	0.031	-0.045	0.030
WINT	-0.011***	0.003	-0.011***	0.002
Org. time demands	-0.008	0.080	-0.009	0.080
Work Emails	-0.531***	0.164	-0.714***	0.173
Org. time demands x Work Emails			-0.475**	0.159
min2Log-likelihood	1161.89 (df =8)		1153.13 (df =9)	
χ2 statistic			8.77 (df =1, p = 0.003)	

Notes. N = 381 observations nested within 105 individuals. Unstandardized coefficients are reported.
*** p < .001; ** p < .01; * = p < .05.

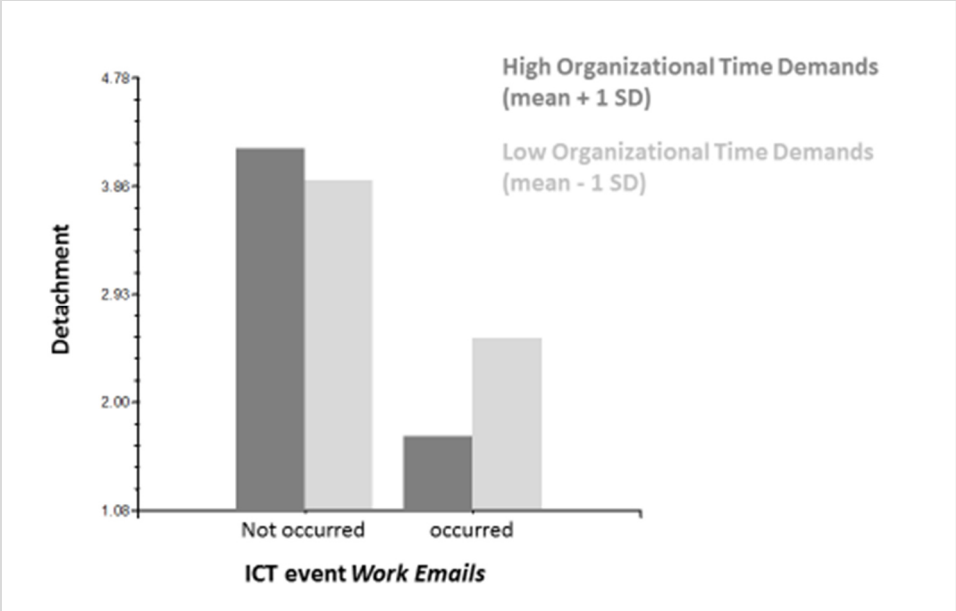

Figure 6. Moderation of Organizational Time Demands on the Relationship Between Work Emails and Detachment.

3.3.3 Additional Analyses

Previous studies have also examined the direct effect of organizational norms and expectations on employee wellbeing, yielding ambiguous results. There is evidence that segmentation norms are positively related to psychological detachment (Park et al., 2011) and to a lower work-home conflict (Kreiner, 2006). Also, Thompson et al. (1999) show in their study that a supportive work-family culture in general is related to lower work-family conflict and that organizational time demands and expectations explain additional variance in work-family conflict. Day et al. (2012), however, could only find limited support for the assumption that ICT availability expectations or ICT response expectations are related to different stress related outcomes. One reason for his may be that they relied on long-term, accumulated stress outcomes (e.g., emotional exhaustion as a part of burnout). The effects of organizational expectations may, however, rather be visible on a daily level (see also Derks et al., 2014).

We also tested if the three facets of organizational expectations would add to the prediction of the daily level of WHC or detachment from work. Our analyses reveal that none of the three facets of organizational expectations was related to the daily level of detachment. For WHC, we found that the model including ICT availability (b = .172, SE = .082, p = .039; Δ-2xlog = 4.28, df = 1, p = .036) and the model including organizational time demands (b = .17o, SE = .073, p = .021; Δ-2xlog = 5.46, df = 1, p = .018) both offer a small improvement over the control model in the prediction of WHC (see also Chapter 3.3.2.2). Thus, employees perceiving strong ICT availability expectations and organizational time demands experience more daily WHC. This is, however, not the case for ICT response expectations. Because the concept of ICT-related organizational expectations in this study may be seen as specifications of (prescriptive) integration norms, our results are in line with previous research (Park et al., 2011; Kreiner, 2006) that provides evidence for positive consequences of segmentations norms (see also Discussion).

3.4 Discussion

3.4.1 Consequences of Work-Related ICT Use During Non-Work Time

In our study, we examined the relationship between work-related ICT use after hours (WINT) and detachment from work/ work-home conflict (WHC) as well as the role of organizational expectations as moderators of these relationships. Our study extends literature on the effects of WINT on employee recovery and wellbeing. Our results suggest that on days where employees used ICT for work during non-work time for a longer period, they were less able to detach from work. This is in line with previous research that has already found evidence for the potential detrimental effects of ICT use after hours on detachment (e.g., Derks et al., 2014; Park et al., 2011). This study extends previous results by showing that the actual time spent with ICT after hours is linked to detachment at the same day, and that these effects may not be attributed to time pressure or the total working hours at the respective day.

There was a different picture for WHC as outcome variable. While a higher number of working hours at the respective day predicted a higher WHC, we did not find an association between WINT and WHC. Thus, previous results that show a relationship between work-related ICT use after hours and WHC (e.g., Boswell & Olson-Buchanan, 2007; Derks et al., 2015; Fenner & Renn, 2010) could not be replicated within our study framework. Different reasons may account for this finding: we controlled for working hours, while not all other studies use similar control variables such as working hours or workload (e.g., Fenner & Renn, 2010). Also in other studies, the effects were not always measured on the daily level (Boswell & Olson-Buchanan, 2007) and relationships that were found significant cross-sectionally might not translate to the daily basis. This means that while on a person level it may be true that employees who regularly work from home perceive a higher level of WHC, at days were a person uses ICT for a longer time, this does not immediately translate to a higher sense of WHC the respective evening. Another explanation of our results may be that in other studies, ICT use was operationalized as a subjective rating of intensity (e.g., Derks et al., 2015). Our approach was to use a more objective measure of the duration in minutes, which did not yield comparable results, suggesting that the individual evaluation of intensity might be an important factor. Future studies might try to disentangle the effects by asking both for objective measures and subjective evaluation.

In Study 1B, we found evidence that a differentiation of the nature of ICT use is significant for the prediction of detachment. In this study, we did not find similar results for WHC (Hypothesis 2). Thus, our results suggest that for the perception of WHC at a given day, the total number of working hours are of predominant importance, while considering the time spent with ICT after hours or

differentiating the nature of ICT use does not improve the prediction of WHC. One reason for this maybe that the relevance of ICT use for the perception of WHC does not show at a daily level (see also previous paragraph). While employees who engage in WINT may feel that they are not able to detach properly, they may only perceive an increased work-family conflict when ICT use occurs over a longer period of time and thus potential negative effects accumulate. Future research should examine those cumulative effects with longitudinal study designs (see also chapter Future Research).

3.4.2 The Moderating Role of Organizational Expectations

Our study provides evidence that organizational expectations are a relevant factor in predicting WHC and Detachment. Our additional analysis suggests that for the daily experience of WHC, organizational expectations are an important factor. Employees perceiving strong ICT availability expectations and organizational time demands experience more daily WHC. This result extents previous research on the effects of segmentation norms on WHC (Kreiner, 2006) by highlighting the relevance of specific injunctive norms in the form of organizational expectations regarding availability via ICT as well as organizational time demands (see also Thompson et al., 1999). Organizational expectations specifically related to message respondence did not contribute to the prediction of WHC. Also, we did not find a relationship between organizational expectations and detachment from work. Park et al. (2011), however, found an association between the perception of a strong segmentation norm and detachment. In their study, they measured both segmentation norms and detachment with a cross-sectional design, while in our study, organizational expectations and detachment were assessed separately, which may have resulted in a weaker relationship due to lower influences of common method variance (Podsakoff et al., 2003).

However, we find initial evidence for a moderation effect of organizational expectations: two of the six moderation hypotheses in the case of WHC are significant: when ICT response expectations or organizational time demands are high, the occurrence of the event *Work Emails* is related to a higher WHC as compared to when those expectations are low. This suggests that while ICT-mediated work at home itself may not be detrimental in that it increases WHC, this effect is present for work emails when the person is expected to reply instantly and to sacrifice private time for work. The effects in this study are small, which means that more research is needed to further support the assumptions. The concept of “telepressure” (Barber & Santuzzi, 2015) may help to further understand the process how response expectations may unfold their effects. For *Work Calls* or *Continuing Tasks*, we do not find moderation effects for WHC as an outcome variable.

For detachment, we found similar interaction effects: again, when ICT response expectations or organizational time demands are high, the occurrence of the event *Work Emails* is related to a lower detachment as compared to when those expectations are low. In addition, ICT availability expectations moderate the relationship between *Work Calls* and detachment, suggesting that work calls after hours are particularly detrimental for recovery when availability is expected by the organization.

Also, the interaction between organizational time demands and the event *Work Emails* is significant and the model offers a significantly better prediction of both WHC and detachment than the predictor models without the interaction effect. When organizational time demands are high, the occurrence of the negative event *Work Emails* is related to a higher WHC and to lower detachment.

The concept of rumination (Cropley & Zijlstra, 2011) may help to understand the effects of organizational expectations in the case of detachment. Rumination is characterized by recurrent thoughts about (work-related) issues. It is possible that the perception of organizational expectations to be available, to respond to messages or to sacrifice private time may increase work-related rumination beyond task-related thoughts because employees might think about what is expected from them and which consequences would follow if they do not conform to those expectations. These thoughts about expectations and sanctions may be conceptualized as affective rumination, which has been linked to negative outcomes in contrast to problem-solving rumination (Cropley & Zijlstra, 2011; Firoozabadi, Uitdewilligen, & Zijlstra, 2016). An increased work-related rumination is likely to be linked to a lower detachment from work. There is a growing body of evidence suggesting that work-related rumination is associated with a range of health problems such as cardiovascular disease, negative mood or sleep disturbance (Syrek & Antoni, 2014). In future research, it would be interesting to examine such mental processes that come along with strong perceived organizational expectations.

Overall, we could find some evidence for a moderation effect of organizational expectations in the case of *Work Emails*. For *Work Calls*, there was only one singular evidence for such effects, while *Continuing Tasks* did not interact with organizational expectations. One explanation for these distinctive results may be that *Work Calls* and *Work Emails* involve communication with others. Thus, in those situations, not complying with (perceived) organizational norms or expectations is more likely to be noticed by significant others which may increase the pressure that is induced by such norms. In the case of *Continuing Tasks*, there is no such direct visibility for other people and the behavior is usually self-initiated to a greater extend. Drawing on self-determination theory (Deci & Ryan, 2000), one might argue that *Continuing Tasks* is more autonomously motivated and thus the effects on WHC or detachment may depend less on the expectations of others compared to communicative ICT events.

3.4.3 Contribution to Previous Research

All in all, our results contribute to literature on both boundary theory (Ashforth et al., 2000) as well as recovery research by providing further evidence for the specific circumstances when boundary-crossing ICT use may have detrimental effects for employees and their recovery in particular. Sonnentag, Binnewies, and Mojza (2008) note that there is still a lack of knowledge about the factors that foster or impede on detachment processes. With our study, we were able to shed further light on specific conditions on a daily basis. We extend previous studies on the role of organizational norms by showing in which specific ICT-related situations *injunctive* norms (in the form organizational expectations regarding availability, response times and time sacrifices) determine potential effects on the perceived level of WHC and detachment from work. Our results suggest a high relevance of work emails: dealing with work emails at home seems to be particularly detrimental in organizational environments with high expectations regarding response time and with high organizational time demands.

Our study also contributes to previous results by applying a multilevel approach, showing cross-level interactions between the more stable level 2 variables concerning organizational expectations and the daily fluctuations in ICT use, WHC and detachment (see also Derks et al., 2014). We were able to exclude potential confounding effects by including the number of working hours and time pressure at the respective day as control variables. Also, we add to previous results by going beyond an assessment of the subjective intensity of ICT use by including the nature and duration of work-related ICT use after hours, which has been claimed also by Derks et al. (2014) and identified as a limitation of their own study.

In our study, we found only little evidence that work-related ICT use during non-work time is directly related to a higher sense of WHC. While detachment from work was lower on days where employees used ICT for a longer time and lower when they were bothered with work emails or other work tasks at home, daily fluctuations in WHC could not be attributed to patterns of ICT use. However, there was evidence for moderation effects, suggesting that it depends to some extend on organizational expectations if WINT affects the daily level of WHC. The importance of organizational expectations for the perceived level of WHC is also supported by our additional analyses, showing that employees perceiving strong ICT availability expectations and organizational time demands tend to experience more daily WHC. We did not find such relationships for the level of detachment from work. Thus, our findings extend research on the interface between life domains as well as on antecedents of work-life balance. We show that WINT seems to have direct detrimental effects on recovery by

hindering detaching from work, but is only associated to a higher perceived interference between work and private life when such behavior is expected by the company.

3.4.4 Limitations and Future Research

We conducted multilevel analyses using diary data, but in this study we focused on daily variables that were collected in the evening before going to bed, thus reporting mostly synchronous effects. However, organizational expectations were assessed at the person level and the dependent variables at a daily level, thus allowing for a stronger independence of those variables. Future studies should further examine how the association between ICT use and recovery evolves in the course of a working week and how organizational demands might have different impacts on this relationship at different times during a week. For example, perceived organizational expectations to engage in WINT may have stronger effects on the relationship between such behavior and wellbeing or recovery during the weekend as compared to workday evenings, because the sense of enjoying private time and thus the feeling of intrusion may be higher during weekends.

Related to that, it should be noted that in our study, we focused on daily fluctuations and immediate effects of ICT-related events. Longer-term analyses of cumulative effects of ICT events might help to get a clearer picture of potential effects on health-related outcomes. For example, Baethge et al. (2015) show that accumulated interruptions at work cause more severe emotional and stress-related reactions as compared to singular events. Similar processes may be assumed for disruptive work events occurring during private time.

We measured the overall working hours and the duration of ICT use, but did not ask for the total overtime. It is possible that employees spent time on other work-related activities that did not involve ICT use. Future research should account for this in order to distinguish general overtime from ICT effects.

For the measurement of organizational expectations, we relied on established items from related scales. Measures of expectations were not balanced, however (1 items vs. 4 items). It might be advisable to develop a coherent and comprehensive measure of the most important facets of organizational expectations regarding availability. Also, we relied on subjective measures of organizational expectations at an individual level. While those perceived norms are likely to be particularly relevant in guiding behavior, future research may include variables on a team or

organizational level in order to verify employee perceptions and obtain further insights in team or organizational dynamics.

Our study was refined to knowledge workers from Germany, which may limit the generalizability of the findings. In general, research regarding technology use as well as the work-life interface has largely neglected cultural factors (cf. Powell et al., 2009). For example, cultures differ in the centrality of work or private life (Powell et al., 2009), which may lead to different evaluations i.e. of intrusive events. Trompenaars (1993) suggests that that in some cultures, people tend to keep work and personal lives separate, while in other cultures, people see an overlap between life domains (culture dimension "specific – diffuse"). From this perspective, work-related events during non-work might have less detrimental effects or may even be less sensed within a culture were life domains are more inter-connected and integrated compared to Germany. Based on these assumptions, cross-cultural comparison will be included in Study 3 in this dissertation.

3.4.5 Practical Implications

Our study suggests that employers need to be aware that even though supplemental work of their employees in the evenings may at first sight be associated to a higher productivity, there are certain pitfalls regarding a disturbed work-home balance or impaired recovery (see also Arlinghaus & Nachreiner, 2014). Thus, both employers and employees should contribute their part to limiting excessive ICT use after hours. In this regard it is important, however, not to enforce strict prohibitions, as this may limit autonomy and lead to a feeling of external control, which has been shown to be detrimental for wellbeing (Ohly & Latour, 2014).

It is important that employers raise awareness for (potentially implicit) organizational expectations and norms regarding availability and message responding. Employers and managers should be transparent about their expectations. It may be advisable to negotiate explicit guidelines within work teams regarding availability and expected response times during absence. Such team guidelines might for example include that explicit (not too short-term) deadlines for response should be added to each email request in order to reduce the feeling of having to answer immediately. Also, a team may agree that when they write emails in the evening or the weekend, they should use the function of temporarily delaying email sending to the next work day in order to reduce pressure for the message receiver.

The predominant role of emails that has been found in this study as well as in Study 1B implies that organizations should analyze and optimize their "email culture" in order to avoid unfavorable habits and practices that may aggravate mutual response expectations. For example, employees might be encouraged to deactivate the push function of their work email account on their smartphones, so that they read work emails after hours only when they actively check their account.

The results of this study may also contribute to the development of intervention strategies, for example stress management trainings or leadership development programs. The role of ICT use as a potential stressor, advantages and disadvantages of (frequent) work outside of working hours as well as the role of managers as roles models and their responsibility for "healthy" work and communication practices in their team should be addressed. Research suggests that managers who are particularly adept at responding to emails quickly may elicit the same responsiveness levels in their employees (Tyler & Tang, 2003). Companies should be aware of these reciprocity processes in email behavior and address unfavorable habits.

3.5 Conclusion

Our study provides further evidence for the potential detrimental effects of work-related ICT use during non-work time (WINT) for employee recovery and adds to literature by distinguishing the role of the duration of WINT as well as different ICT events. We were able to find some evidence for the assumption that organizational expectations (organizational time demands and ICT response expectations in particular) may aggravate the effects of WINT on psychological detachment from work and WHC. Also, high expectations to be available and to sacrifice private time for work are associated to a stronger feeling of WHC at a daily level. Thus, companies should be aware of – and address – organizational norms and expectations regarding ICT use that may have unfavorable effects on employee recovery and wellbeing.

4. Study 3: Work-Related ICT Use During Non-Work Time and Work-Life Balance – a Comparative Study in Germany and China

4.1 Introduction

In Study 1 and 2 in this dissertation, we found evidence for potentially detrimental effects of work-related ICT use after hours on wellbeing and recovery. However, Study 2 suggests that this relationship is influenced by organizational norms such as availability expectations or response time expectations. Apart from those organizational norms, the work-home interface and the role of ICT use is also shaped by individual values. For example, the centrality of work, defined as "the belief that individuals have regarding the degree of importance that work plays in their lives" (Paullay, Alliger, & Stone-Romero, 1994, p. 225) is likely to determine how a person experiences the interference between life domains. For both individual values as well as organizational norms, the cultural surroundings of a person or an organization plays an important role. The concept "culture" has been subject to a long tradition of research and has been framed as ''the collective programming of the mind that distinguishes the members of one group or category of people from another'' (Hofstede, 1997, p. 9). Culture expresses itself in ''shared motives, values, beliefs, identities, and interpretations or meanings of significant events that results from common experiences of members of collectives that are transmitted over generations'' (House, Hanges, Javidan, Dorfman, & Gupta, 2004, p. 15). The core of most culture definitions is that members of a culture share values and beliefs that are learned through socialization (see also Joplin, Shaffer, Francesco, & Lau, 2003). Those values constitute the common understanding of what is "good, right, and desirable" and shape specific norms about what is appropriate in which situation (Schwartz, 1999). Nevertheless, individuals within one culture differ from each other and cultural descriptions only constitute general frameworks of orientation that may not necessarily predict individual behavior (Ollier-Malaterre et al., 2013).

Cross-cultural research has found substantial differences in cultural values and practices that touch the areas of work life and personal life (Ollier-Malaterre et al., 2013; Powell et al., 2009). However, even though culture is expected to play a key role in shaping the work-family interface, cultural factors have for a long time been neglected in this research stream (Aycan, 2008; Ollier-Malaterre et al., 2013; Powell et al., 2009; Shaffer, Joplin, & Hsu, 2011). Norms and values related to the cultural meaning and enactment of work and family may influence the nature and strength of the relationship between individuals' experiences in both life domains (Ashforth et al., 2000). Thus, many

of the variables that have been examined in recent work-family research seem to be effected by culture (Powell et al., 2009). In this respect, "culture" may be conceptualized on different levels. Most cross-cultural research focuses on cultures of national groups. Even though national boundaries "do not necessarily correspond to the boundaries of organically developed, relatively homogeneous societies with a shared culture" (Schwartz, 1999, p. 25), the historical, political and societal national background constitutes a strong force towards common values and perceptions in a given nation (Hofstede, 1997), justifying the use and relevance of focusing on national cultures.

Initial research effort has been undertaken looking at cultural – usually national – specifics in the work-family interface. Those studies pursue different goals. Some cross-cultural studies aim at examining if their proposed work-family models work globally. They focus on the perceived conflict between the work and family domain, which arises due to incompatible role expectations (Greenhaus & Beutell, 1985; Netemeyer, Boles, & McMurrian, 1996). This interrole conflict has been conceptualized in a bidirectional manner, distinguishing between work interfering with family (work-family conflict) and family interfering with work (family-work conflict) (e.g., Frone et al., 1992). Most cross-cultural studies focus on the former. An example is the study of Joplin et al. (2003) that aimed at developing a general framework of work-family conflict across cultures. Similarly, Hill, Yang, Hawkins, and Ferris (2004) conducted a study in 48 countries and show that the same model of demands, work-family conflict and job attitudes fitted the data globally as well as in culturally related country groups. The authors emphasize, however, that the strong company culture of IBM, where they collected their data, may also be an explanation why no differences between national groups were found. Also, they did not examine if national culture might be a moderator influencing the relationships between their variables of interest (see also Spector et al., 2007).

In contrast to the assumption that models of the work-family interface work globally, other studies look at potential cultural specifics. Those studies can be divided into emic approaches, examining the specific situation in one culture, and etic approaches, focusing at cross-cultural comparison (Ollier-Malaterre et al., 2013; Schaffer & Riordan, 2003). Within the existing work-family research, most studies have been conducted in the US and it is doubtful if these results can be transferred to other national contexts. Apart from the question of the universal applicability of theories and models regarding the work-family interface, there is also a high practical relevance of this question. When multinational companies for example have to decide on HR policies that affect the work-family interface, it is an important question if it is possible to apply the same policies in all countries (Shaffer et al., 2001).

There are studies in Asian countries in particular with the goal to validate – or challenge – the applicability of US-based research results. For example, there has been first effort to understand cultural particularities in the work-family interface in India (Aryee, Srinivas, & Tan, 2005), in Singapore and Hong Kong (Thein, Austen, Currie, & Lewin, 2010) or in China (Choi, 2008; Lai, 1995; Ling & Powell, 2001; Luk & Shaffer, 2005). Those studies give important insights in the specific situation in the respective countries and often challenge previous studies that are biased towards the US. However, these studies that follow an emic approach do not involve a direct cross-cultural comparison and do not directly assess cultural influences (Ollier-Malaterre, 2013).

Etic studies aim at directly comparing the phenomena of interest in different countries. Again, most research effort has been put into comparing Western countries (mostly the US) to Asian cultures (e.g., Aryee et al., 1999; Hassan et al., 2010; Lu et al., 2006; Yang et al., 2000). Some singular studies consider other national cultures such as the Ukraine and Iran (Karimi, 2008; Mortazavi, Pedhiwala, Shafiro, & Hammer, 2009) or Finland (Kinnunen & Mauno, 1998).

All in all, cross-cultural approaches in the work-family interface have been only rarely implemented so far. Ollier-Malaterre et al. (2013, p. 434) phrase it as an "elephant in the room" – everybody speaks of the importance of cultural factors but rarely anyone really addresses them.

The goal of this study is to contribute to previous research by further examining potential cross-cultural differences in the work-home interface[6]. Previous studies found initial evidence of significant differences between Western and Eastern cultures in particular. We[7] want to extend those findings by further differentiating culture-specific approaches to dealing with the interference between life domains. More specifically, we examine cultural differences in how the work and home domain are being viewed and handled. We then specifically look at the role of technology use. Previous studies have shown negative consequences of ICT use and work-related ICT use during non-work time. To our knowledge, there is no study to date that has examined if ICT use behavior patterns and their consequences on wellbeing identified in Western cultures are similar in Asian contexts.

We chose China as the culture to be compared to our data in Germany. In our opinion, comparing data in these cultures as examples of a Western and an Eastern culture provides a valuable

[6] As in Study 2 in this dissertation, we use the terms work-home interface/ work-home conflict in order to include a broader range of potential life domains apart from family (see also Kreiner, 2006).

[7] This study was conducted in cooperation with a Chinese research partner who is Associate Professor of the Department of Leadership and Organization Management at a University in Beijing. The questionnaires were jointly developed and Chinese data was collected by the research partner. His specific involvement in the study will be more clearly explained in the method section.

opportunity to examine cultural effects. Earlier research has found significant differences between the two countries on various dimensions, most importantly individualism-collectivism (Hofstede, 1997; Triandis, 1995), which has been hypothesized and empirically found to be an important factor related to difference in the work-home interface (see also Chapter 4.1.1). For example, Luk et al. (2005) note that in China as a collectivistic society, work is viewed as a means ultimately contributing to family welfare, honor and prosperity. Thus, "work is not something that interferes with family life; instead, it is a means of providing for the family" (Luk et al., 2005, p.502). Given the existence of previous studies conducted in China, choosing it as country of comparison offers the opportunity to draw on first evidence for cultural differences for the development of concrete hypotheses.

4.1.1 The Cultural Context: Individualism and Collectivism as an Important Cultural Dimension Related to the Work-Home Interface

When analyzing cultural differences in cross-cultural research, researchers claim the importance of not only comparing country groups in variables of interest, but also trying to capture the cultural context itself. This helps to identify potential reasons and culture specific values or motivations for cultural differences detected in the data (Ollier-Malaterre et al., 2013; Powell et al., 2009; Riordan & Vandenberg, 1994). Many studies do not draw upon any theoretical basis regarding the specific cultural background or values (Shaffer et al., 2001, p. 105).

There has been some research on the connection of cultural values or dimensions and the work-home interface, most commonly drawing on the cultural dimension "individualism vs. collectivism" (Hofstede, 1997; Triandis, 1995). In several studies and theoretical frameworks, researchers have argued how individualistic and collectivistic cultures differ in their perception and evaluation of work and personal life (for an overview see Ollier-Malaterre et al., 2013; Ollo-López & Goñi-Legaz, 2015; Powell et al., 2009). The cultural dimension distinguishes between cultures where people are linked closely with other group members and identify with the groups they belong to (collectivistic), and cultures where individuals are more independent from others (individualistic) (Triandis, 1995). House et al. (2004, p. 30) further specify in-group collectivism as "the degree to which individuals express pride, loyalty, and cohesiveness in their organisations or families". When in-group collectivism is high, people are highly interdependent with their in-groups and clearly distinguish between in-groups and out-groups. Collectivistic cultures emphasize group needs over individual needs, suggesting that members of collectivistic cultures view their roles more integrated than those of individualistic cultures (Ollo-López & Goñi-Legaz, 2015).

Research further suggests that in collectivistic societies, work is seen as a way of supporting the family, while in individualistic cultures, individual fulfillment is an essential part of work (Ollier-Malaterre, 2013). For example, Lu et al. (2006) found that work demands are more strongly related to work-family conflict – and also family demands are more strongly related to family-work conflict – in Britain (individualistic) compared to Taiwan (collectivistic). Similar results were found by Spector et al. (2007) when comparing the Anglo culture cluster and collectivistic nations in Eastern Europe, Latin America and Asia.

One shortcoming of previous studies is that while comparing country groups in variables of interest (including moderator effects), they often do not directly asses the cultural context or cultural values that may account for cross-cultural differences they may find (Riordan &Vandenberg, 1994, Shaffer et al., 2011). The consequence is that assumptions regarding underlying reasons and causal interpretations stay theoretical. Thus, in our study, we aim at considering the cultural context and verifying previous assumptions regarding the concrete specification of cultural dimensions in our study sample. We assess cultural values as they are perceived on an individual level by our study participants, which has been specified as "individual cultural orientations" (see also Wang, Lawler, Walumbwa, & Shi, 2004). In order to provide evidence for cultural tendencies, the aggregated values within a cultural group have to be examined. Based on existing cross-cultural research where China is counted as a collectivistic culture and Germany as an individualistic culture (e.g., Hofstede, 1997; Triandis, 1995), we expect that our German participants on average differ from Chinese participants on the dimension individualism-collectivism:

Hypothesis 1: Chinese participants on average score higher on collectivism than German participants.

4.1.2 Cultural Differences Regarding the Segmentation/ Integration of Life Domains

Within the scope of boundary theory, there has been a wide range of research concerning the segmentation or integration of life domains (e.g., Ashforth et al., 2000; Edwards & Rothbard, 2000; Nippert-Eng, 1996). More specifically, researchers distinguish between individual segmentation/ integration preferences and (organizational) segmentation/ integration norms. Individuals differ in their preference for either segmented life domains with clear boundaries, or for integrated life domains with permeable work-home boundaries and nor clear distinction between the life domains (Kreiner, 2006). As a counterpart of those individual preferences, he distinguishes organizational

norms (or supplies) that also range between segmentation and integration norms. Both preferences and norms have distinctive effects on behavior as well as wellbeing-related outcomes (e.g., Chen et al., 2009; Kossek & Lautsch, 2012; Kreiner, 2006; Peters, Michel, & Sonntag, 2014; Rothbard, Phillips, & Dumas, 2005).

According to recent theorizing (Aryee et al.,1999; Ashforth et al., 2000), a person's cultural background affects how life domains are being perceived as separate or as integrated and interdependent. More concretely, Schein (1984) observed that the blurring of the work and family role is less likely in the United States and European countries due to the specific work ethics and values. Previous empirical studies found cultural differences between China and Western countries on various levels of the perception and management of the interface between work and family life (e.g., Choi, 2008; Ling & Powell, 2001; Lu et al., 2006; Spector et al., 2007; Westwood & Lok, 2003; Yang et al., 2000). With regard to the segmentation/ integration of life domains, Zhang, Li, and Foley (2014) specify that Chinese employees tend to integrate work and family roles, which can be attributed to a general holistic approach in the Chinese culture with a focus on the whole, not on the parts, of an object (Nisbett, Peng, Choi, & Norenzayan, 2001). Thus, life domains are more likely to be seen integrated or overlapping (Powell et al., 2009). Another important issue is the relative importance that is being attributed to the work and family life. Zhang et al. (2014, p. 15) introduce the concept of Prioritizing Work for Family (PWF), suggesting that "Chinese employees are strongly committed to family as an ultimate goal, while simultaneously prioritizing work as a critical means to reach that goal". Thus, overtime or sacrificing family time for work is seen as acceptable as it will benefit the family in terms of money or societal status. In the US, on the contrary, prioritizing work is viewed as a personal career pursuit or a self-interest (Yang et al., 2000).

These observations suggest that in China, the integration of life domains will be stronger than in Germany. However, it seems important to further specify the personal need for a certain situation and the actual situation that is being enacted. With regard to cultural values in general, it is one of the most important contributions of the GLOBE study to highlight that on a certain dimension, cultural practices (as-is) and cultural values (as should-be) often differ significantly within one culture (House et al., 2004). In work-family research, the distinction between preferred vs. enacted boundaries has proven to be important (Ammons, 2013; Keeney, Boyd, Sinha, Westring, & Ryan, 2013). However, this distinction is not always clearly made. For example, the assessment of boundary management strategies (e.g., Kossek, Lautsch, & Eaton, 2006) constitutes a mixture of behavior aspects and preferences, which makes it difficult to interpret potential outcomes. Thus, in our study we differentiate between segmentation preference on the one hand and actual segmentation on the

other hand. Even though we expect preference and actual situation to go hand in hand, the separation allows for differentiated interpretations of the results. We expect that based on the cultural values described above, Chinese employees will have a stronger preference for an integration of life domains, which will also translate to a higher level of actual integration.

Hypothesis 2: Chinese employees score lower on actual segmentation as well as segmentation preference than German employees do.

For the preference – or enactment – of integrated or segmented life domains and roles, the cultural dimension individualism/collectivism is likely to play an important role. There have been previous approaches assuming that cultural dimensions may be a predictor, accounting for culture-specific differences in behavior and its consequences. For example, Ashforth et al. (2000) propose that in collectivistic cultures, individuals tend to integrate roles, whereas in individualistic cultures, a segmentation of roles will be predominant. Powell et al. (2009, p. 605) further expect that due to an employer-employee relationship shaped by protection and loyalty in collectivistic cultures, "members of collectivist cultures receive higher levels of social support, leading to lower levels of both family-work conflict and work-family conflict, than members of individualist cultures."

Empirical evidence on the predictive power of the cultural dimension individualism/ collectivism is scarce. Kuchinke et al. (2011) examine different cultural dimensions as predictors of the importance of different life domains in eight countries. Billing et al. (2014) find in their study that vertical individualism (the tendency to emphasize independence of action and the need to differentiate oneself from others) predicts work-family conflict across national boundaries, highlighting the importance of considering cultural values beyond nationality. This is in line with previous approaches, suggesting that collectivism is related to a strong interdependence between family members (Yang et al., 2000) together with a higher level of family support regarding the prioritizing of work for the ultimate goal of family welfare (Zhang et al., 2014).

Based on the theoretical assumptions and previous empirical evidence described above, we suggest that collectivistic values will be related to actual segmentation (see also Ashforth et al., 2000) as well as work-home conflict (WHC) (see also Billing et al., 2014; Lu et al., 2006; Spector et al., 2007) in the following way:

Hypothesis 3: Collectivism predicts a lower actual segmentation as well as lower levels WHC.

Testing this hypothesis also provides an opportunity for finding cultural explanations concerning Hypotheses 1 or 2.

4.1.3 Cultural Differences in Life-Domain Crossing ICT use

4.1.3.1 Work-Related ICT Use After Hours

For the segmentation/ integration of life domains as well as for the subjective work-life balance, communication technology play a more and more important role. An increasing number of employees use their technical devices – and mobile devices in particular – to work anytime from anywhere, also in their free time. In this regard, ICT on the one hand provides great opportunities for managing one's own boundaries as desired, but at the same time may lead (also unintentionally) to blurring boundaries between work and private life and work-family conflict (e.g., Derks et al., 2014; Richardson & Thompson, 2012). ICT usage is a good example for the fact that behavior strategies meant to help might still have negative side effects (e.g., Diaz et al., 2012; Mazmanian et al., 2013; Middleton & Cukier, 2006).[8]

To our knowledge, there has been no study regarding the role of technology use in the work-home interface with an explicit cross-cultural approach. More explicitly, there is no database providing for conclusions about the national specifics regarding the form or prevalence of work-related ICT use during non-work time. Given the cultural differences in the notion of the work-home interface and the role and importance of different life domains (see Chapter 4.1.2), it is likely that in China and Germany employees differ in how intensely as well as in which form they use ICT for work after hours.

An international survey conducted by the Münchner Kreis e.V. (2013) reveals that in general, Chinese use ICT more than Germans (e.g., 71 % of the Chinese study participants and 50 % of the Germans used smartphones), and that more Chinese use mobile internet for both work and private issues (60 % compared to 29 % of the Germans). Combining these numbers with the results of previous work-family research helps to predict cultural differences in ICT use for work after hours. As Chinese employees tend to integrate work and family roles (Yang et al., 2000) and tend to prioritize work while sacrificing family time for work demands (Zhang et al., 2014), we expect Chinese participants to be more prone to engage in work-related ICT use during non-work time.

Following our approach in Study 1 and 2, we further differentiate ICT use in a) the general frequency of ICT use after hours as well as b) different forms of ICT use. We draw on Study 1B/2 for a differentiation of work events related to ICT use after hours. In the present study, we use them as

[8] In Study 1 and 2, we provide an in-depth characterization of research findings on the role of ICT use in general and work-related ICT use after hours in particular for the work-home interface.

neutral events, whereas in Study 1 and 2 they were conceptualized as affective events with either negative or positive valence. The reason is that in the present study, we aim at explicitly separating the frequency of occurrence and its consequences, in order to assess cultural differences on both levels. Thus, in this study, we focus on the occurrence of three neutral ICT-related events, namely the receipt of work emails or work calls as well as the continuation of work tasks outside of working hours.

Hypothesis 4: Chinese employees engage in work-related ICT use after hours more frequently and experience ICT events (work emails, work calls and continuing tasks after hours) more frequently than German employees do.

4.1.3.2 ICT-mediated Boundary Management Tactics (BMT)

Hypothesis 4 covers two important communication channels that allow the work domain to intrude into the life domain: work emails and work calls. Those two events, as conceptualized in study 1 and 2, capture if a person receives important or urgent work calls or emails after hours. While the examination of the occurrence and frequency of those intrusions is important (see Study 1 and 2), they do not give evidence on how a person deals with those intrusions. In order to fully capture possible cultural differences in ICT use and its effects on wellbeing, it is important however to also consider culture-specific (or culture-general) behavioral reactions to those events. The concept of boundary management tactics seems to be a promising approach in this respect. Strategies to deal with work-life boundaries ("boundary work" / "boundary management tactics"/ "boundary management strategies") have been examined and described mainly in qualitative studies (e.g., Kreiner, Hollensbe, & Sheep, 2009; Nippert-Eng, 1996; Sayah, 2013). Quantitative studies on the role of boundary management strategies are scarce and often limited in their measures, as they for example mix active and passive behaviors (such as Kossek, Ruderman, Braddy, & Hannum, 2012) or preferences and actual behavior (Kossek et al., 2006). In order to capture how a person deals with work-related intrusions into private life, it is important in our opinion to avoid those confounded concepts and concentrate on active, intentional behavior patterns. Sayah's (2013) study is a valuable groundwork to this approach. She in her study explicitly concentrates on ICT-mediated boundary management tactics (BMT), describing how employees use their phones and message accounts to shape their work-life boundaries. She finds several strategies, which can be summarized and grouped along to the segmentation/integration continuum. Segmentation-focused ICT-mediated BMT are: a) using separate mobile phones for work and private correspondence, b) using different messaging accounts for work and private correspondence and c) switching off the work mobile phone when leaving work.

Integration-focused BMT are a) automatically updating work messages on one's, b) replying to work emails at home and c) answering work calls at home[9].

Building on our previous assumptions that Chinese employees tend to integrate work and private roles more than German employees (Hypothesis 2) and that Chinese employees engage more frequently in work-related ICT use after hours (Hypothesis 4), we further specify:

Hypothesis 5: Chinese employees engage more often or intensely in integration-related BMT, Germans more often or intensely in segmentation-related BMT.

4.1.4 Cultural Differences in the Effects of ICT Use on Wellbeing: Culture as a Moderator

There is a vast body of research examining how work-related ICT use after hours may affect employee wellbeing and recovery (see also Study 1 and 2). Most of those studies have been conducted with US American samples. It is likely, however, that those results cannot be fully applied to members of other cultures, as for example "Chinese workers experience work-family conflict in a manner not fully captured by an American perspective" (Ling & Powell, 2001). There are several theories and previous empirical findings that help to argument how and why employees in China (as an Eastern culture) and Germany (as a Western culture) are likely to differ in their reactions to work demands affecting family life. An important aspect is the meaning or centrality of work and family as well as the importance of work-life balance, which may differ from culture to culture (Den Dulk, Groeneveld, Ollier-Malaterre, & Valcour, 2013). Substantial differences between Western and Eastern cultures regarding the role of work and family have been suggested and empirically found in previous research. Aryee et al. (1999) illustrate that in the Chinese society, work is seen as a means for enhancing family wellbeing, whereas in the US work is motivated by different reasons, of which family responsibilities are only one. They then argue that "as a result, U.S. employees are more likely to perceive family responsibilities as interfering with work demands" (p. 497). Westwood and Lok (2003) argue in a similar way, suggesting that in China work centrality is high, but that employees show an instrumental orientation regarding work as a means of contributing to the family. Zhang et al. (2014) argue that in China, employees prioritize work for family, meaning that they "are strongly committed to family as an ultimate goal, while simultaneously prioritizing work as a critical means to reach that goal" (p. 15).

[9] This separation into integration and segmentation-related tactics is not part of the original work of Sayah (2013).

They also discuss consequences for the experience of work-family conflict, suggesting that Chinese employees, "although they may report a high level of W-FC in the Western sense, […] are more tolerant of such situations and less likely to view the intrusiveness as conflict. Thus, they are less likely to blame the work domain because they do not think work is the source of conflict." Even when they perceive a high level of work intruding into the family domain, they may thus still experience a high level of work-life balance (Zhang et al., 2014). This can be explained by the observation that Eastern societies are more likely to accept inconsistencies or ambivalence (Choi, Koo, & Jong, 2007; Nisbett et al., 2001), which also applies to potential inconsistencies between prioritizing work while ultimately putting family first (Zhang et al., 2014).

Previous empirical findings on cross-cultural differences in the experience of WHC and the relationship between work demands and WHC or wellbeing indicators are inconsistent however: Spector et al. (2004) found in their studies that in Anglo country clusters, work demands (work hours, perceived workload) are more strongly related to strain-based work-family interference that in China (see also Spector et al., 2007). Pointing into a similar direction, Lu et al. (2006) found that the relationship between workload and work-family conflict was stronger for British participants than for Taiwanese. Hassan et al. (2010) found that work interference with family is lower for Malaysians than for Westerners, which they explain by the "paternalistic nature of the organization and relationship between superior and subordinate in Eastern culture" (p. 41). They further explain that in a collectivistic culture, work is supported by family members, who do not perceive work obligations as a disturbance to family life (see also Zhang et al., 2014). Another study suggests the opposite direction: Yang et al. (2000) show that the relationship between work demands and WHC was stronger for Chinese than for Americans. They interpret their results based on the observation that in China, "sacrificing family time for work is viewed as self-sacrifice for the benefit of the family or as a short term cost incurred to gain long-term benefits. In the US, sacrificing family time for work is often perceived as a failure to care for significant others" (Yang et al., 2000, p. 120). From this argumentation, they conclude that the effect of work demands on work-family conflict will be stronger in China than in the US. However, similar to Spector et al. (2007), we would expect the opposite effect based on the same argumentation. As in China, sacrificing family time is for the benefit of the family, the negative consequences (e.g., feeling of work-family conflict) will be lower.

Based on this theoretical reasoning and empirical evidence, we expect that in Germany as an individualistic culture, ICT use after hours will be perceived as a neglect of family or other private responsibilities, as well as more intrusive (due to more segmented life domains) and thus evaluated negatively and related to a higher work- home conflict and lower work-life balance. In China, ICT use

after hours may be evaluated as a helpful contribution to the family and as an acceptable means to a long-term goal, leading to a lower feeling of WHC.

Hypothesis 6a: Nationality moderates the relationship between work-related ICT use and WHC, such as that for German participants, ICT use is more strongly related to WHC than for the Chinese participants.

Previous studies have focused on work-family conflict/ work-home conflict as an outcome variable. However, there are promising approaches of further differentiating potential consequences of work-family interference. Valcour (2007) introduces the concept satisfaction with work-family balance that focuses on the subjective evaluation of the situation, taking into account the role of cognitive appraisal (Lazarus & Folkman, 1984; Peters et al., 2014). On the negative side, the new construct work-family guilt (Korabik, 2015) provides for an assessment of negative emotions accompanying the negligence of family members for the sake of work. With the same reasoning as in the case of WHC, we expect German participants to experience decreases in the satisfaction with work-life balance (WLB) and increases in work-family guilt when they engage in work-related ICT use after hours more frequently.

Hypothesis 6b: Nationality moderates the relationship between work-related ICT use and WLB, such as that for German participants, ICT use is more strongly (negatively) related to WLB than for the Chinese participants.

Hypothesis 6c: Nationality moderates the relationship between work-related ICT use and work-family guilt, such as that for German participants, ICT use is more strongly (positively) related to work-family guilt than for the Chinese participants.

With Hypotheses 6a to 6c, we aim at contributing to work-family research, by further differentiating the culture-specific notion of work-life balance or conflict with a focus on ICT use after hours and ICT-mediated boundary management tactics.

Besides work-family issues, in the European and US American research regarding the effects of ICT use, there has been considerable effort to examine the role of ICT use for recovery, focusing on the psychological detachment from work. Those studies show that boundary crossing ICT use hinders employees' detachment from work (Derks et al., 2014; Park et al., 2011) and that, in contrast, clear boundaries between life domains foster detachment (Sonnentag et al., 2010). In Study 2 in this dissertation, we were also able to show that on a daily basis, work-related ICT use after hours was related to a lower detachment from work, emphasizing the potential detrimental effects of ICT use on recovery.

It is likely that not only the relationship between ICT use and work-family-related outcomes, but also the relevance of ICT use for recovery is subject to cultural factors. Based on the previous reasoning that in China, life domains are seen as integrated and that work is seen as a means to support family, we expect that there is a weaker relationship between ICT use and psychological detachment for Chinese employees. It is likely that with integrated life domains and thus the omnipresence of work in the home domain, the level of detachment is lower in general. In consequence, the occurrence of work-related ICT use might have less effect on detachment, which is never fully achieved in the first place – and potentially also less desired in a cultural context with a tendency towards integration. In the context of this study, we are particularly interested in the interaction effect, thus hypothesizing the following:

Hypothesis 6d: Nationality moderates the relationship between work-related ICT use and detachment, such as that for German participants, ICT use is more strongly related to a lower detachment than for the Chinese participants.

4.2 Method

4.2.1 Study Approach and Procedure

The general study design was developed by the author of this study. The questionnaire was jointly developed with our Chinese research partner who is an expert in the work-family interface research. Schaffer and Riordan (2003) recommend conducting cross-cultural studies in teams, with each collaborator being an expert on one of the cultures in the study. Data was collected in China and Germany independently. In China, data was collected by the Chinese research partner.

4.2.2 Construction of the Questionnaire

In our questionnaire, where possible we drew on scales that have been successfully used in cross-cultural research before. When selecting and adapting items, we were careful to avoid ambiguous terms and potential sources of misunderstanding in order to allow for an equivalent understanding of items in both groups. For example, we used direct measures of WHC and other outcome variables, “instead of relying on US measures that require respondents to make the cognitive connection between work and family” (Shaffer et al., 2011, p. 251). Shaffer et al. call for measures that explicitly assess the overlap or interference between life domains. In addition, we substituted the word

"family" where possible and applicable in order to avoid influences of different notions of the word. While in Germany, "family" usually refers to the nuclear family with partner and children, in China the term "family" is more expansive and includes the greater family (Shaffer et al., 2011, p. 253). Also, we tried to avoid items that are worded in opposite direction, as reverse-worded items do not always work the same way in all languages (Spector, Liu, & Sanchez, 2015).

The same scales were used in both samples and administered in both countries in the respective native language. An English version of the questionnaire was first translated into Chinese and back-translated into English, thus following the translation – back translation procedure recommended for cross-cultural research by Schaffer and Riordan (2003). Irregularities were discussed between the two researchers and agreed upon. In the next step, the adapted English version was translated to German (see also approach in Oreg et al., 2008). The Chinese and German version were then compared by a bilingual fluent in both languages. Only few discrepancies were found and were discussed until agreement was reached regarding the most appropriate translation.

The questionnaire was distributed as an online version in Germany and as a paper-pencil version in China, both constituting the preferred and most common channel of data collection in each country. This difference in data collection methodology, however, seems not to be a concern, as previous research found that using online or paper questionnaires in cross-cultural samples did not significantly change the results (see Spector et al., 2015).

4.2.3 Data Collection and Participants

We collected data in Germany and China separately. In order to ensure the best possible comparability of samples we focused on one industry (see recommendations by Schaffer & Riordan, 2003), namely the banking sector, and kept the procedures as similar as possible. With this strategy, we were able to rule out effects of potentially different industries taking part in the study (see also the recommendations of Spector et al., 2015). We also tried to align the samples in terms of the specific jobs they do (Spector et al., 2015) at their bank by approaching employees with management position, consultants as well as employees in HR and IT services. We recruited employees working in different nationally and internationally operating banks throughout Germany and China. In total, 358 bank employees (199 Chinese, 159 Germans) took part in our survey.

Table 13 provides an overview of the demographic variables by country as reported in the questionnaire. Where applicable, we used t-tests or chi-square tests to examine if both samples significantly differed in the respective demographic variable.

Table 13. Study 3 Demographic Variables by Country

Variables	**Country**		**Test Statistics**		
Continuous variables	Germany	China	T	Df	Sig
Age	38.0 (11.2)	35.4 (6.1)	2.71	354	0.01
No. of children at home	0.5 (0.8)	0.6 (0.6)	-1.01	350	0.31
Working hours	42.4 (6.7)	47.1 (11.3)	-4.69	352	0.00
Binary variables	Germany	China	X^2	Df	Sig.
Female	41.5	53.0	4.69	1	0.03
With leadership position	39.6	36.2	0.45	1	0.51
Married/ living together	68.0	83.0	11.81	1	0.00

Notes. For continuous variables, means, standard deviations and t-test results are reported. For binary variables, proportions of yes-answers and chi-square results are reported.

The mean and proportional comparisons show that the Chinese and the German sample significantly differ in most demographic variables. In the Chinese sample, there were more women, participants were younger on average and a greater proportion of participants were married or living together. The average number of children however was comparable in both samples. In the German sample, a slightly (but not significantly) higher percentage of participants held a leadership position. Lastly, Chinese participants had longer weekly working hours in comparison to the German participants.

Those substantial differences in our samples may limit cultural comparisons between the two groups. We will further comment on this study limitation in the discussion session. Based on this demographic picture, we decided to consider all demographic variables except the leadership position as control variables for our analyses (see below).

4.2.4 Measures

In order to examine our study hypotheses, we used the following measures. Where not indicated otherwise, we used a 5-point Likert scale from “strongly disagree” to “strongly agree”. The complete questionnaire with all items and answer formats is presented in the Appendix 3 (English, German and Chinese version).

Frequency of work-related ICT use after hours (ICT Frequency): We assessed the frequency of ICT use with the single item "How often do you work from home using ICT (mobile phones, pads, laptops, PC)?" Answers were indicated on a 5-point Likert scale, using seldom or never, a few times a month, a few times a week, almost every day and everyday.

ICT events (*Receiving Work Emails*, *Receiving Work Calls*, *Continuing Tasks*): Similar to study 2, we differentiated ICT use after hours according to the results of our event taxonomy from Study 1A. We assessed the frequency of three negative ICT event categories (*Receiving*[10] *Work Emails, Receiving Work Calls, Continuing Tasks*) with the respective items from the checklist developed in Study 1B. The wording of the daily items was adapted to a general level. The instruction was "The following items refer to ICT-related events that may occur during private time. Please indicate for each event how often it occurs." A sample item is "I receive (urgent) work emails during private time" (event *Receiving Work Emails*). Answers were indicated on a 5-point Likert scale from "seldom or never" to "everyday" as for ICT frequency. Thus, we adapted the day-level answer format from Study 1B and 2 so that it is applicable for a cross-sectional study and allows for assessing the overall frequency of occurrence.

ICT-mediated Boundary Management Tactics (BMT): We developed items to assess behavior-related BMT based on the qualitative data of Sayah (2013). Items include integration-related as well as segmentation-related techniques. Segmentation-related items were captured by the items "I use separate mobile phones for work and private correspondence" (*BMT1 Separate Devices*), "I have different accounts (email, instant messaging) for work and private correspondence" (*BMT2 Separate Accounts*) (both binary "yes-no" answer scale) and "When I leave work, I switch off my work mobile phone." (*BMT3 Switch off*) (5-point Likert scale from "never" to "almost always"). Integration-related BMT were captured by the items "I automatically update work messages on my devices" (*BMT4 Automatic Update*) (yes/no), "To what extent do you respond to work messages after work?" (*BMT5 Replying to Messages*) (5-point Likert scale from "I do not read work-related messages" to "I read and answer all work messages") and "To what extent do you respond to work calls after work?" (*BMT6 Answering Calls*) with an answer scale comparable to BMT5.

Segmentation Preference: We assessed segmentation preference using the respective scale from Kreiner (2006). Respondents were asked to indicate the extent to which they agreed with each of the four items representing segmentation preferences. Items are: "I don't like to have to think about

[10] In order to more clearly differentiate between the event of an incoming email and the respective boundary management tactic regarding replying to those messages, we named the event *Receiving Work Emails* (vs. only *Work Emails* in Study 1B and 2). The same applies to work calls accordingly.

work while I'm at home", "I prefer to keep work life at work", "I don't like work issues creeping into my home life" and "I like to be able to leave work behind when I go home."

Actual Segmentation: We assessed actual segmentation as a counterpart to segmentation preference using an adapted version of Kreiner (2006), substituting all expressions indicating preference with expression indicating how the actual situation is (see also Powell & Greenhaus, 2010). A sample items is "I do not think about work while I'm at home."

Work-Home Conflict (WHC) was assessed with the widely used Work-Family Conflict Scale by Netemeyer et al. (1996). Items were adapted so that to the term "home" or "private" was added to "family" in order to include other facets of non-work life (see Chapter 3.1.1). A sample items is "The demands of my work interfere with my home and family life."

Satisfaction with Work-Life Balance (WLB) was assessed with the respective scale by Valcour (2007). Respondents were asked to indicate on a scale from (1) very dissatisfied to (5) very satisfied, their level of satisfaction with five items, among those: "… the way you divide your time between work and personal or family life" and "…the way you divide your attention between work and home".

Work-Family Guilt was assessed with four items of the Work-Family Guilt Scale (Gonçalves, Sousa, Santos, Silva, & Korabik, 2017; Korabik, 2015). From the bidirectional scale, we only used those items that represent work interference with family guilt (and not the opposite direction), as this was our main research interest. A sample item is "I regret not being around for my family as much as I would like to".

Detachment from work was assessed with four items from the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007). A sample item is: "After work I do not think about work at all".

Collectivism: we used the scale provided by Dorfman and Howell (1988) and adapted the items to meet the purpose of our study. As we were interested in family-(and work) related issues and thus in family as a group unit (rather than for example societal groups), we decided to specify "groups" in all items using the term "family". The items were "Family welfares is more important than individual rewards"; "Individuals should only pursue their goals after considering the welfare of their family", "Individuals need to sacrifice their own goals for the benefits of family".

4.2.5 Control Variables

In Study 2, we referred to previous research showing that WHC is higher when stress is high (Byron, 2005; Ford et al., 2007) and that workload is a significant predictor for work-home interference (Derks et al., 2015). Also in a cross-cultural context, Spector et al. (2007) found working hours as a significant demand. Thus, we used the average working hours as a control variable. This was particularly important, as there was a significant difference in working hours between the two national groups (see Chapter 4.2.3). As we also found different distributions in the two samples in terms of gender, age and family status, we also used those as control variables in our moderation analyses.

4.2.6 Strategy of Data Analysis

In order to capture group differences in the variables of interest (Hypotheses 1, 2, 4, 5), we analyzed mean differences with the help of t-tests (see also approach in Spector et al., 2007). Along with the t-test, we also tested for homoscedasticity with the Levene test in order to avoid interpreting values with biased standard errors. For the binary variables, we used the Chi-square test to check if distributions differed between our samples. In addition, we ran ANCOVAS for all group difference tests with nationality as a predictor and the above-mentioned control variables as covariates. Hypothesis 3 was analyzed using regression analyses with the cultural dimension collectivism as a predictor (see also Spector et al., 2007). The proposed moderation effects in Hypotheses 6a to 6d were examined with moderated regression analyses (Spector et al., 2015) with country as a binary moderator. For the latter case, Dawson (2014) proposes that the general approach to moderation analyses has to be adapted only such as that the binary variable should not be centered and that the values 0 and 1 should be used (in our case: 0 = German group and 1 = Chinese group). In addition, we followed Dawson's (2014) recommendation to use the values of the moderator at which to plot and test simple slopes.

4.3 Results

4.3.1 Descriptive Statistics

Table 14 present the means, standard deviations and Cronbach alpha values of the study variables for the German as well as the Chinese sample (for the demographic variables, refer to Chapter 4.2.3). Table 15 contains the correlation matrix.

Table 14. Means, Standard Deviations, and Cronbach Alpha Values of Study 3 Variables

	Germans		Chinese	
	Mean (SD)/ Proportion	alpha	Mean (SD)/ Proportion	alpha
BMT1 Separate Devices	49 %	-	8 %	
BMT2 Separate Accounts	84 %	-	20 %	
BMT3 Switch Off	2.29 (1.46)	-	1.41 (0.93)	
BMT4 Automatic Update	45 %	-	24 %	
BMT5 Replying to Emails	2.39 (2.39)	-	3.77 (0.99)	
BMT6 Replying to Calls	2.89 (1.34)	-	4.27 (1.03)	
ICT frequency	1.82 (1.03)	-	3.03 (1.37)	
Event Continuing Tasks	1.62 (0.89)	-	2.83 (1.27)	
Event Receiving Calls	1.30 (0.57)	-	2.85 (1.20)	
Event Receiving Emails	1.40 (0.86)	-	2.23 (1.23)	
Actual Segmentation	2.60 (0.87)	.89	3.19 (1.00)	.92
Segmentation Preference	3.64 (0.94)	.91	4.03 (0.90)	.94
WHC	2.74 (0.99)	.84	3.08 (1.01)	.95
WLB	3.42 (0.82)	.92	3.29 (0.87)	.96
Detachment	3.41 (0.82)	.86	3.45 (0.91)	.91
Work-Family Guilt	2.43 (1.70)	.89	3.26 (1.04)	.96
Collectivism	3.16 (0.65)	.63	3.58 (0.73)	.81

Notes: Answer scale for BMT1/2/4 was yes-no. Percentages of yes-answers are reported. For BMT3, the answer scale was “never” to “almost always” (1-5), for BMT5/6, ICT frequency and ICT events from “never” to “every day” (1-5),

Table 15. Correlations for all Study 3 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1 BMT1		.34**	.25**	.16*	-.07	-.09	-.06	-.05	-.06	-.05	-.02	-.08	-.03	-.09	-.09	-.01	-.06	.00	-.06	-.03	-.02	-.20**	.10
2 BMT2	.36**		.17	.20**	-.18*	-.14*	-.15*	-.18*	-.15*	-.09	.06	-.13	-.17*	.06	.03	-.12	.03	-.02	.18*	.05	.03	.07	-.07
3 BMT3	-.03	.10		.10	-.11	-.16	.05	.09	.07	.13	.16	-.14	.06	.06	.03	.09	-.04	-.13	-.14	.01	.08	-.16	.05
4 BMT4	.44**	.25**	-.04		.01	.09	.07	.12	.03	.12	-.09	-.04	.11	-.18**	-.21**	.10	-.05	-.07	.17*	.09	.07	.10	.12
5 BMT5	.15	.04	-.42**	.38**		.58**	.27**	.40**	.34**	.26**	-.28**	-.10	.10	-.11	-.18*	.11	.10	-.08	-.08	.05	.11	.09	.19**
6 BMT6	.07	.06	-.44**	.16*	.48**		.16*	.26**	.26**	.17*	-.24**	-.05	.05	-.15*	-.14*	.16*	.15*	-.04	.09	.12	.18*	.18*	.12
7 ICT freq.	.27**	.21**	-.29*	.39**	.43**	.12		.80**	.63**	.59**	-.23**	-.02	.39**	-.25*	-.30**	.33**	.18*	-.15*	-.09	-.08	-.05	.10	.24**
8 Event Tasks	.18*	.13	-.38**	.35**	.49**	.17*	.69**		.69**	.64**	-.28**	-.01	.46**	-.26**	-.29**	.35**	.19**	-.20**	-.11	.01	-.01	.18*	.29**
9 Event Calls	.16*	-.04	-.34**	.39**	.49**	.26**	.46**	.57**		.69**	-.18*	.08	.36**	-.17*	-.20**	.25**	.19**	-.16*	-.01	.04	.07	.16*	.16*
10 Event Mails	.21**	.08	-.37**	.31**	.43**	.14	.49**	.62**	.68**		-.14	.01	.40**	-.15*	-.22**	.32**	.19**	-.16*	-.06	-.08	.03	.11	.15*
11 Actual Seg.	-.08	-.01	.31**	-.10	-.48**	-.17*	-.28**	-.38**	-.39**	-.32**		.39**	-.17*	.40**	.55**	-.01	.06	.01	-.05	.01	.03	-.12	-.23**
12 Seg.Pref.	-.15	-.13	.22	-.25**	-.36**	-.18*	-.46**	-.34**	-.26**	-.24**	.32**		.14*	.07	.26**	.17*	.15*	.01	.03	.07	-.04	.09	-.07
13 WHC	.14	.00	-.21	.16	.30**	.17*	.11	.17*	.30**	.15	-.39**	.00		-.47**	-.30**	.62**	.12	-.23**	-.06	.07	.10	.04	.26**
14 WLB	-.05	.09	.11	-.02	-.16*	-.12	.13	-.03	-.06	-.02	.18*	-.26**	-.63**		.60**	-.41**	.15*	.02	.00	-.05	-.06	-.13	-.45**
15 Detach.	-.08	.14	.32**	.00	-.43**	-.10	-.21**	-.25**	-.34**	-.26**	.66**	.20*	-.40**	.30**		-.22**	.10*	.09	-.04	.03	-.02	-.12	-.26**
16 WF Guilt	-.04	-.11	-.04	-.03	.14	.12	-.05	.11	.13	.05	-.11*	.04	.31**	-.42**	-.21**		.11	-.13	-.07	.12	.13	.07	.30**
17 Collectiv.	-.01	-.02	-.15	.14	.05	.00	.03	.04	.04	.08	.06	.18*	.01	.02	.06	.07		-.15*	-.06	.08	.05	-.03	-.07
18 Gender	-.09	-.06	-.02	-.11	-.01	-.01	-.08	-.06	.00	-.08	-.11	.09	-.02	-.07	.02	.03	-.28**		-.12	-.01	-.05	-.26**	-.11
19 Age	.11	.14	-.02	.12	.06	.12	.10	.10	-.04	.05	-.17*	-.11	.01	.10	-.01	-.04	.02	-.22**		.11	.33**	.41**	-.09
20 Family	.00	-.04	-.22	.02	-.03	.14	.17*	.06	-.01	.07	-.02	.02	-.03	.16*	.07	-.08	.10	-.16*	.28**		.38**	.07	.14
21 Children	-.02	.07	-.03	.17*	.09	.17*	.18*	.08	.09	.13	.01	-.06	.05	.07	-.01	-.02	.21**	-.29**	.38**	.39**		.10*	-.06
22 Leadership	.24**	.18*	-.15	.27**	.26**	.22**	.37**	.34**	.18*	.29**	-.23**	-.31**	.13	.04	-.18*	.03	.06	-.31**	.40**	.24**	.25**		.14*
23 Work. hours	.24**	.01	-.14	.22**	.23**	.03	.25**	.34**	.23**	.17*	-.22**	-.18*	.40**	-.25**	-.21**	.14	.06	-.26**	.07	.04	-.15	.47**	

Notes: *p < .05; **p < .01. Correlations below diagonal represent the German sample (N=159), correlations above the diagonal the Chinese sample (N=199).

4.3.2 Testing Measurement Invariance

Cross-cultural research faces the challenge that participants in different countries might not respond similarly to the survey items, calling for tests regarding the equivalency or invariance of measures, for example before interpreting differences in means between country groups (Riordan & Vandenberg, 1994; van de Vijver & Tanzer, 1997). Given the large cultural and linguistic differences between our two samples, it was advisable to test measurement invariance for each multi-item scale. We followed the recommendations by Riordan and Vandenberg (1994) as well as Schaffer and Riordan (2003) using Confirmatory Factor Analyses as a method, which is common in the case of cross-cultural comparisons. Item Response Theory as an alternative is usually applied for scale development and item testing (Raju, Laffitte, & Byrne, 2002; Spector et al., 2015), which was not our primary focus.

In accordance with common recommendations, we tested for measurement invariance on three levels, with each step introducing additional equality constraints on model parameters to achieve stronger forms of invariance. Invariance tests were performed in the following hierarchical ordering of nested models: configural invariance, metric invariance, and scalar invariance. Configural Invariance means that the same items measure the respective constructs across group. Metric equivalence means that the factor loadings of items are equivalent across groups, suggesting that the construct has the same meaning across administrations. Scalar equivalence means that in addition to factor loadings, item intercepts are equivalent across groups. This implies that participants who have the same value on the latent construct should have equal item values. In our study, we tested all three forms of measurement invariance for all items that had more than three items (see also Spector et al., 2007). With the help of Chi-square difference tests, we examined if model fit gets worse when imposing additional constraints in each step. We also consulted different model fit indices, namely CFI, TLI, RMSEA and SRMR, as recommended for example by Milfont and Fischer (2010). They resume that model fit can be considered good with CFI and TLI values above 0.95, RMSEA values below 0.06 and SRMR values below 0.08.

Table 16 displays the results for the three steps of measurement invariance testing for actual segmentation, segmentation preference, satisfaction with WLB, Detachment from Work and Work-Family Guilt. For configural invariance, we tested the model fit for both groups separately to discover potential differences in both groups. The model for both samples shows the overall model fit and builds the baseline for Chi-Square difference tests for the following steps.

Table 16. Measurement Invariance Analyses

Invariance Level	Configural			Metric	Scalar
	Germans	Chinese	Both		
Actual Segmentation					
Chi-Square	2.972	20.536	4.752	43.896	152.034
df	2	2	2	8	12
RMSEA	0.055	0.216	0.062	0.158	0.244
CFI	0.997	0.969	0.997	0.963	0.854
TLI	0.992	0.907	0.991	0.944	0.854
SRMR	0.013	0.023	0.010	0.141	0.187
Chi-Square Diff. Test				39.144(6)**	108.138 (4)**
Segmentation Preference					
Chi-Square	1.441	2.675	1.485	5.768	87.108
df	2	2	2	8	12
RMSEA	0.000	0.041	0.000	0.000	0.187
CFI	1.000	0.999	1.000	1.000	0.936
TLI	1.004	0.997	1.001	1.003	0.936
SRMR	0.008	0.006	0.004	0.041	0.175
Chi-Square Diff. Test				4.283 (6) n.s.	81.946 (4)**
Satisfaction WLB					
Chi-Square	36.035	39.334	52.300	77.600	98.284
df	5	5	5	15	20
RMSEA	0.198	0.186	0.163	0.153	0.148
CFI	0.945	0.972	0.972	0.965	0.956
TLI	0.889	0.944	0.943	0.953	0.956
SRMR	0.034	0.017	0.020	0.074	0.114
Chi-Square Diff. Test				25.3 (10)**	20.684 (5)**
Detachment					
Chi-Square	66.139	10.672	100.589	80.855	213.961
df	2	2	2	8	12
RMSEA	0.449	0.148	0.371	0.226	0.307
CFI	0.829	0.983	0.877	0.917	0.771
TLI	0.486	0.949	0.631	0.876	0.771
SRMR	0.077	0.026	0.067	0.085	0.152
Chi-Square Diff. Test				19.73 (6)**	213.88 (4)**
Work-Family Guilt					
Chi-Square	6.478	82.134	19.660	120.775	146.727
df	2	2	2	8	12
RMSEA	0.119	0.449	0.157	0.281	0.250
CFI	0.982	0.871	0.975	0.869	0.844
TLI	0.945	0.612	0.924	0.804	0.844
SRMR	0.032	0.052	0.026	0.091	0.119
Chi-Square Diff. Test				101.115 (6)**	25.95 (4)**

Notes. Measurement invariance was tested for multi-item scales (> 3 items). Metric models were tests against the configural model, scalar models against the metric models. *p < .05; **p < .01.

The table shows that for actual segmentation, configural invariance may be assumed, but neither metric nor scalar invariance was given, with the latter showing particularly poor fit indices. For

segmentation preference, the general model fit is very good (configural invariance) and also metric invariance may be assumed. Again, there is no scalar invariance. The comparison of the means of both actual segmentation as well as segmentation preference (Hypothesis 3) are thus questionable (see Chapter 4.4.1.1). All wellbeing indicators that are used as outcomes for the moderation analyses (Hypothesis 6) show mediocre to poor fit indices in all steps of invariance testing. Only for detachment from work, it was possible to identify a specific item with particularly low factor loadings (item detachment4*,"After work I don't think about work at all"*). Omitting this item also slightly increased scale reliability (from Cronbach alpha = 0.86 to Cronbach alpha = 0.88 in the whole sample). Thus, we continued our analyses with the remaining three items.

Overall, our analyses show that measurement invariance is not given for most multi-item scales. This indicates that German and Chinese participants conceptualized the respective constructs differently (lack of metric invariance) or use different rating levels (lack of scalar invariance). Thus, when interpreting the following study results, measurement invariance has to be taken into account as a limitation. However, it is still possible to test certain hypotheses with limited measurement equivalence (see for example Cheung & Rensvold, 1998; Welzel & Inglehart, 2016), which is why we decided to test our hypotheses as planned despite the lack of invariance of some of the scales. We only eliminated one items (detachment4, see above) and kept all other items in our analyses. We will further discuss the issue of measurement equivalence and point out potential limitations and interpretations related to non-invariance in the discussion section.

4.3.3 Testing of Hypotheses

4.3.3.1 The Role of Collectivism (Hypotheses 1 and 3)

Hypothesis 1 predicts that Chinese will be higher on collectivism than Germans. Our data support this hypothesis: In the Chinese sample, the mean value is significantly higher than in the German sample ($collectivism_{China}$ = 3.58, $collectivism_{Germany}$ = 3.16; t = 5.82; df = 356, $p < 0.01$; Levene test of homoscedasticity not significant). Hypothesis 3 states that collectivism will predict a lower actual segmentation as well as lower levels of WHC. This hypothesis was not supported. On the contrary, collectivism predicted a higher actual segmentation (b = 0.20; SE = 0.07; p = 0.01) and a higher WHC (b = 0.17; SE = 0.07; p = 0.02).

4.3.3.2 Segmentation/ Integration, ICT Use After Hours and Boundary Management Tactics (Hypotheses 2, 4 and 5)

Based on our hypotheses, we compared the group means or proportional distributions of the Chinese and German participants in all variables related to the segmentation/ integration of life domains as well as those related to ICT use. In contrast to Hypothesis 2, we found that the Chinese sample scored significantly higher on actual segmentation as well as on segmentation preference (see Table 17). The assumptions regarding ICT use in Hypothesis 4 were fully supported. The frequency of work-related ICT use after hours was higher in the Chinese sample and all ICT-related events occurred more often in the Chinese sample (see Table 17).

Hypothesis 5 deals with the distribution of different BMT in both culture groups (see Table 17 and 18). As expected, in the German sample, more participants use separate devices (BMT1) and accounts (BMT2) for work and private correspondence and more often switch off their work phones after work (BMT3). Thus, the German participants on average score higher in segmentation-related BMT than the Chinese. The latter score higher on integration-related BMT: they more often respond to work emails (BMT5) and answer work calls (BMT6) after work. Only for BMT4 results did not support our hypothesis: a higher proportion of the German participants indicate that they automatically update work messages at their devices. Thus, except for the latter BMT, Hypothesis 5 was supported.

Table 17. Group Differences Germany – China (Continuous Variables)

	Mean (SD)		Levene test[1]		T-Test		
Variables	Germans	Chinese	F	Sig.	t	df	Sig.
Actual Segmentation	2.60 (0.87)	3.19 (1.00)	4.6	0.03	5.97	353.7	0.00
Segment. Preference	3.64 (0.94)	4.03 (0.90)	2.7	0.10	4.04	356.0	0.00
BMT3 Switch Off	2.29 (1.46)	1.41 (0.93)	26.9	0.00	-4.74	110.1	0.00
BMT5 Repl. to Messages	2.39 (1.08)	3.77 (0.99)	0.9	0.35	12.62	356.0	0.00
BMT6 Answering Calls	2.89 (1.34)	4.27 (1.03)	15.9	0.00	10.65	291.3	0.00
ICT frequency	1.82 (1.03)	3.03 (1.34)	17.5	0.00	9.53	354.8	0.00
Event Continuing Tasks	1.62 (0.89)	2.83 (1.27)	22.6	0.00	10.59	350.4	0.00
Event Receiving Calls	1.30 (0.57)	2.85 (0.57)	69.1	0.00	16.16	296.9	0.00
Event Receiving Emails	1.40 (0.86)	2.23 (1.23)	24.3	0.00	7.53	350.6	0.00

Notes: [1] where homoscedasticity was not given (significant Levene test), adjusted t-test results (without the presumption of homoscedasticity) are reported.

Table 18. Group Differences Germany – China (Binary Variables)

	Proportion of yes-answers (%)		Chi-square test			
Variables	Germans	Chinese	X^2	df	N	p
BMT1 Separate Devices	49	8	79.23	1	358	$p < 0.01$
BMT2 Separate Accounts	84	20	148.06	1	358	$p < 0.01$
BMT4 Automatic Update	45	24	17.70	1	358	$p < 0.01$

All group differences were still significant when controlling for age, gender, number of children, leadership status and family status.

4.3.3.3 Nationality as a Moderator (Hypotheses 6a to 6d)

Hypotheses 6a to 6d include multiple sub-hypotheses, assuming that nationality moderates the relationships between various ICT use variables and the four outcome variables. For the sake of a more clear and stringent presentation and interpretation of results, we do not present our results along the sub-hypotheses 6a to 6d, but provide interaction effects of all sub-hypotheses sorted by independent variable. For all outcome variables, we entered all control variables mentioned in Chapter 4.2.5 separately in a first step. Only working hours was significant in the case of all outcome variables. Thus, we used working hours as control variable for all subsequent moderation analyses. We also ran all models a second time without control variables, which did not change the results. Table 19 provides a summary of all significant interaction effects. We provide an overview of which sub-hypotheses were supported in the end of the section. A detailed presentation of all significant interaction effects can be found in the Appendix 4.

Table 19. Significant Interaction Effects of Nationality on the Relationship Between Technology Use/ Boundary Management Tactics and Wellbeing

	WHC (Hyp 6a)	WLB (Hyp. 6b)	WFGuilt (Hyp 6c)	Detach. (Hyp. 6d)
ICT Frequency				
Main effect IV	b = 0.09	b = 0.22**	b = -0.17	
Main effect nationality	b = 0.06	b = -0.04	b = 0.70***	
Interaction effect	b =0.23+ (Figure 7)	b = -0.34** (Figure 8)	b = 0.42* (Figure 9)	
Event Continuing Tasks				
Main effect IV		b = 0.07		
Main effect nationality		b = 0.02		
Interaction effect		b = -0.19+ (Figure 10)		
Event Receiving Calls				
Main effect IV				b = -0.58***
Main effect nationality				b = 0.61***
Interaction effect				b = 0.42** (Figure 11)
Event Receiving Emails				
		No significant effects		
BMT5 Replying to Messages				
Main effect IV	b = 0.30**			b = -0.39***
Main effect nationality	b = 0.01			b = 0.44***
Interaction effect	b = -0.24* (Figure 12)			b = 0.23* (Figure 13)
BMT6 Answering Calls				
		No significant effects		

Notes: IV = independent variable. WFGuilt = Work-family guilt. *** p < .001; ** p < .01; * = p < .05.; + = p. < .10

For ICT frequency, all results that were significant were in contrast to our hypotheses: The relationship between ICT frequency and WHC was stronger in the Chinese sample (Figure 7). Simple slope tests using the procedure suggested by Dawson (2013) revealed that the slope for the Chinese sample was significant (b = 0.32, t = 5.04, p < 0.01), but not the slope for the German sample (b = 0.09, t = 0.9, p = 0.37). Thus, when using ICT after hours more frequently, WHC does not significantly increase for German participants.

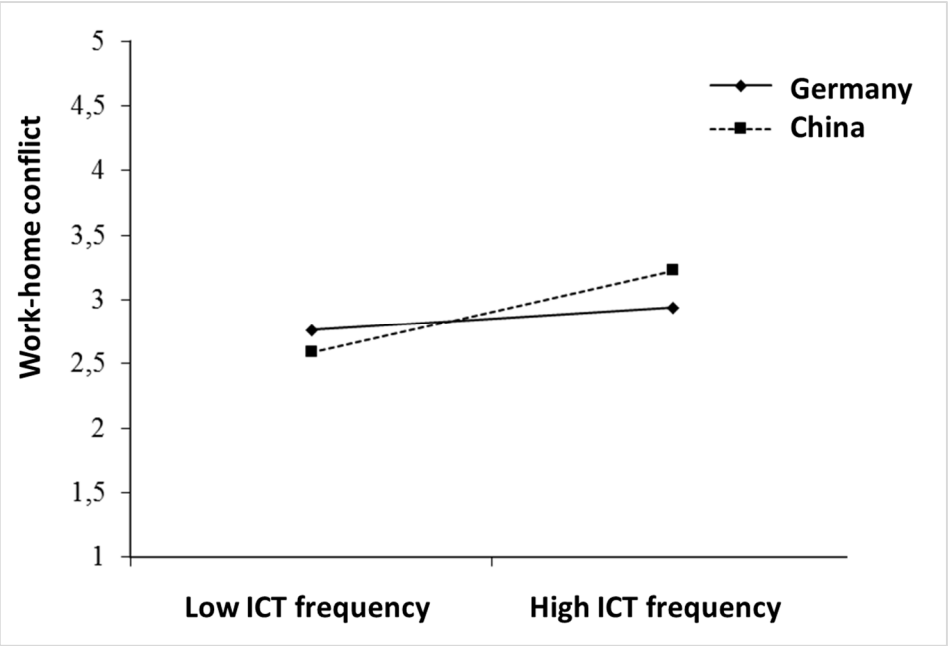

Figure 7. Effect of Nationality on the Relationship Between ICT Frequency and Work-Home Conflict

Using the satisfaction with WLB as an outcome, we also found different slopes for the two samples (see Figure 8). In this case, the slope for the German sample was significant (b = 0.22, t = 2.57, p = 0.01), but not the slope for the Chinese sample (b = - 0.12, t = -0.42, p = 0.67). Thus, in the Chinese sample the frequency of ICT use is not related to the satisfaction with WLB. In the German sample however, a higher ICT frequency is related to a higher satisfaction with WLB.

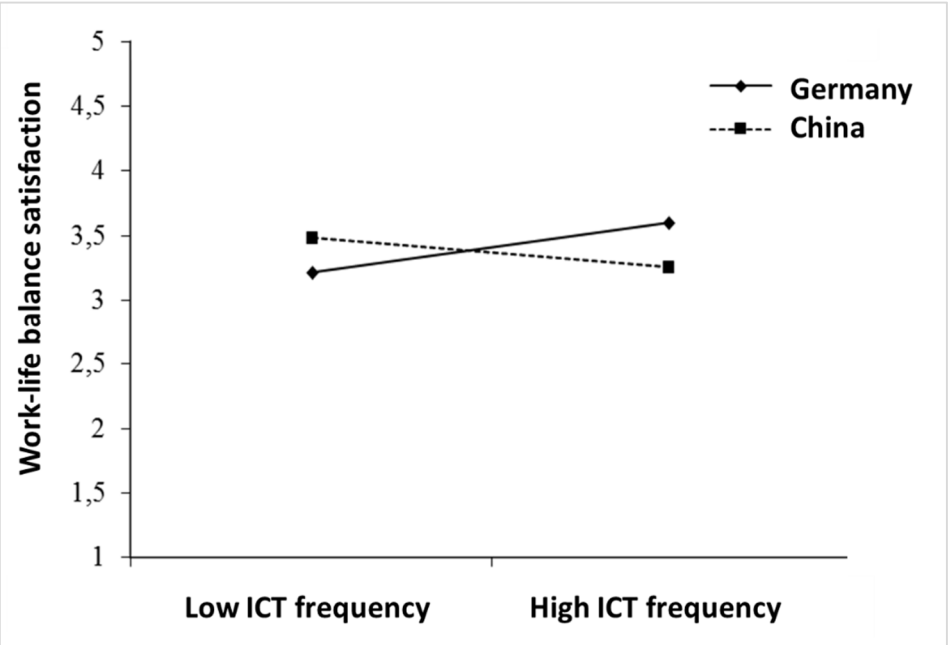

Figure 8. Effect of Nationality on the Relationship Between ICT Frequency and Satisfaction with Work-Life Balance

For work-family guilt, we found a significant relationship only for the Chinese sample (see Figure 9): a higher ICT frequency is related to a higher work-family guilt (b = 0.25, t = 2.40, p = 0.01). The ostensible decrease of work-family guilt in the German sample is not significant (b =- 0.17, t = 1.40, p = 0.26).

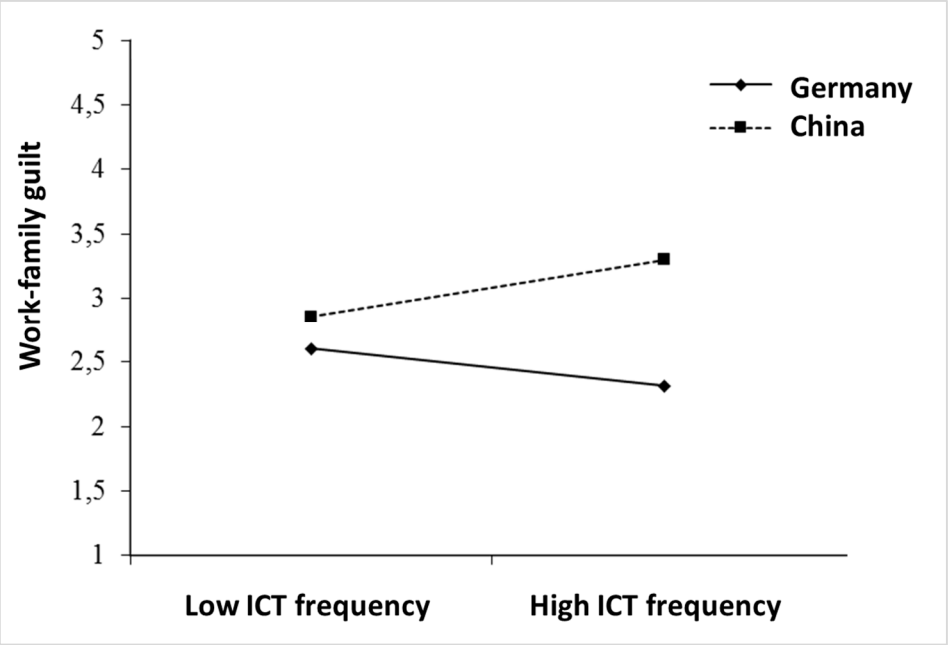

Figure 9. Effect of Nationality on the Relationship Between ICT Frequency and Work-Family Guilt

The event *Continuing Tasks* did not significantly interact with the variable nation except for the relationship with satisfaction with WLB (see Figure 10). In contrast to our hypothesis, we found that only for the Chinese, a higher frequency of the event *Continuing Tasks* was related to lower levels of WLB (b = -0.12, t = -2.2, p = 0.03). The slope for the German sample was not significant (b = 0.26, t = 1.4, p = 0.16).

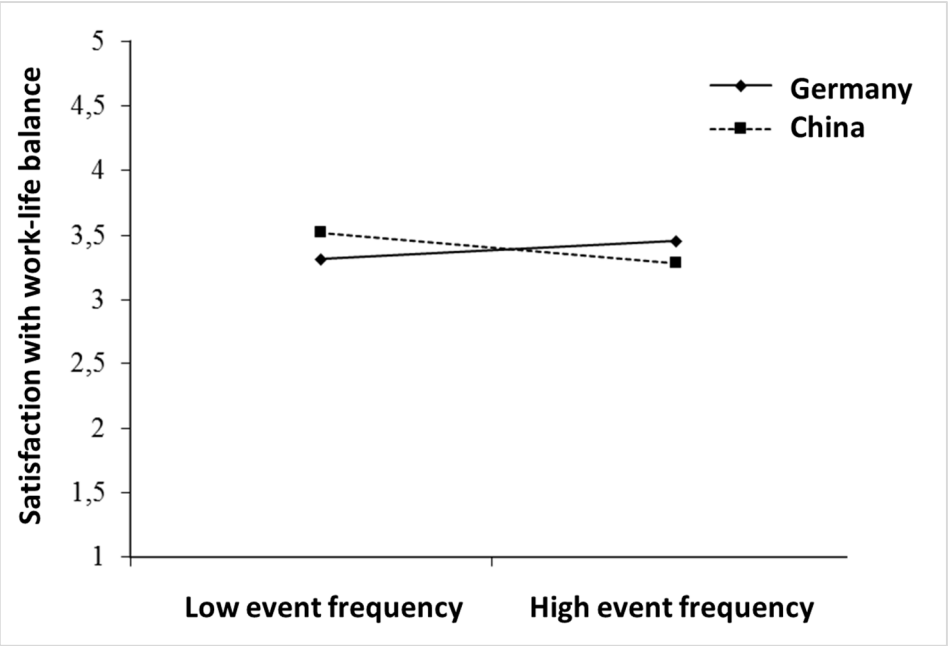

Figure 10. Effect of Nationality on the Relationship Between the Event *Continuing Tasks* and Satisfaction with Work-Life Balance

The other four ICT use variables yield few significant results, but those were in line with our expectations: with a higher frequency of the event *Receiving Calls*, detachment decreases for Germans more strongly compared to the Chinese (see Figure 11). Simple slope analyses confirmed a significant decrease for both groups, but a stronger decrease for the German participants (China: b = -0.16, t = -2.5, p = 0.01; Germany: b = -0.58, t = -4.0, p < 0.01).

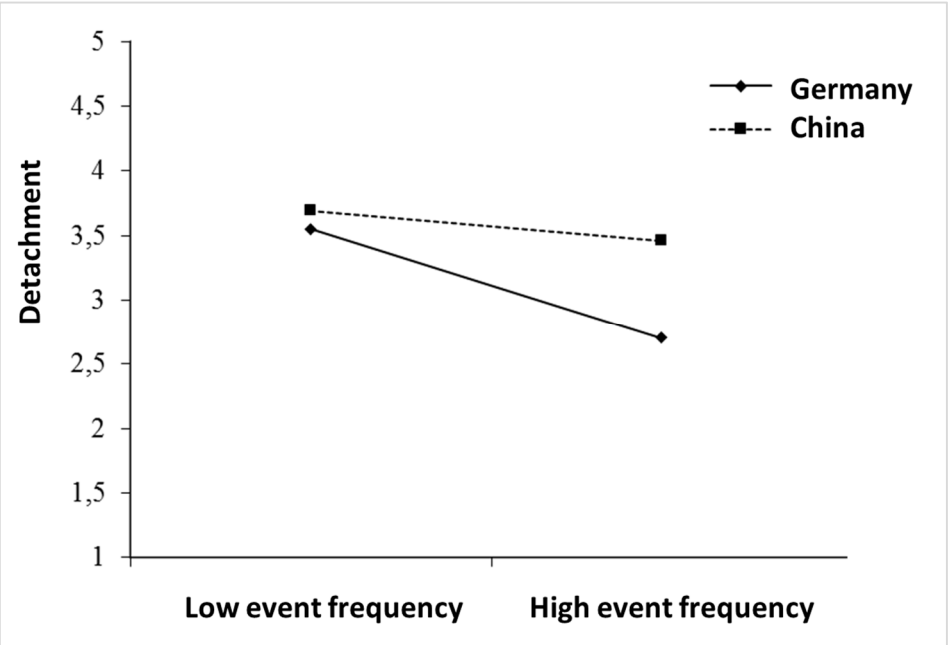

Figure 11. Effect of Nationality on the Relationship Between the Event Receiving Calls and Detachment

In addition, as can be seen in Figure 12, with a stronger intensity of replying to emails (BMT5), WHC increases for German participants (b = 0.3, t = 3.30, p = 0.01), but not for the Chinese (b = 0.05, t = 0.55, p = 0.58).

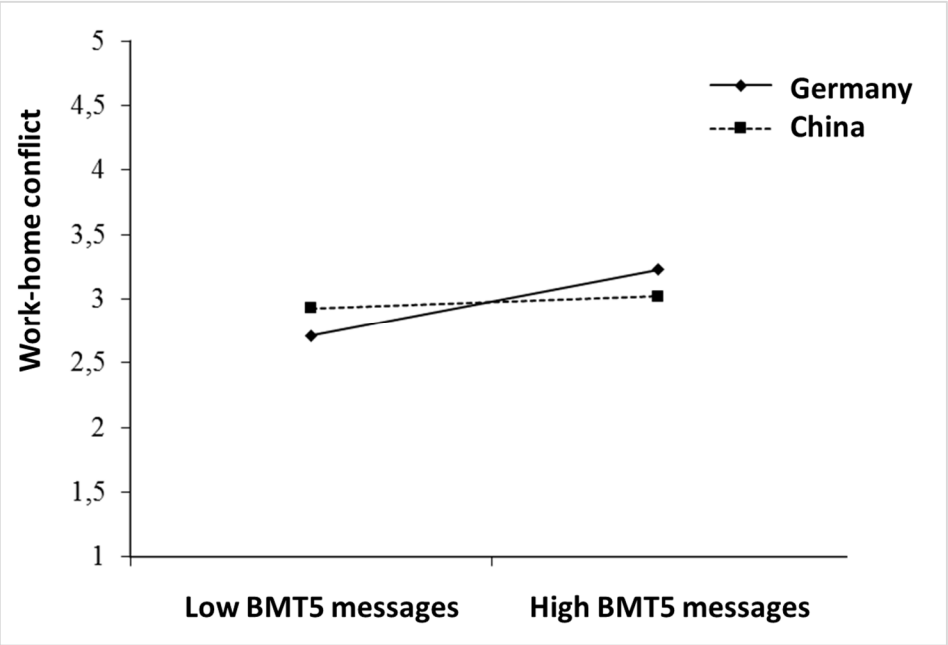

Figure 12. Effect of Nationality on the Relationship between BMT5 (Replying to Messages) and Work-Home Conflict

There was also a significant interaction effect of the *BMT5 (Replying to Messages)* and nationality with detachment as an outcome variable (Figure 13). With a higher intensity of replying to emails, detachment decreases for Germans more strongly than for Chinese. The decrease was significant for both samples (China: b = -0.16, t = -2.2, p = 0.03; Germany: b = -0.39, t = -5.0, p < 0.01).

Overall, all of our sub-hypotheses (6a to 6d) were either only partially supported or not supported at all. Hypotheses 6a and 6d, assuming moderation effects for the relationship between ICT use/ BMT and WHC/ detachment were supported only for the effects of *BMT5 (Replying to Emails),* but not for the other independent variables. Hypotheses 6b (work-life balance) and 6c (work-family guilt) were not supported at all. For all for sub-hypotheses, there were single results that contradicted the hypotheses.

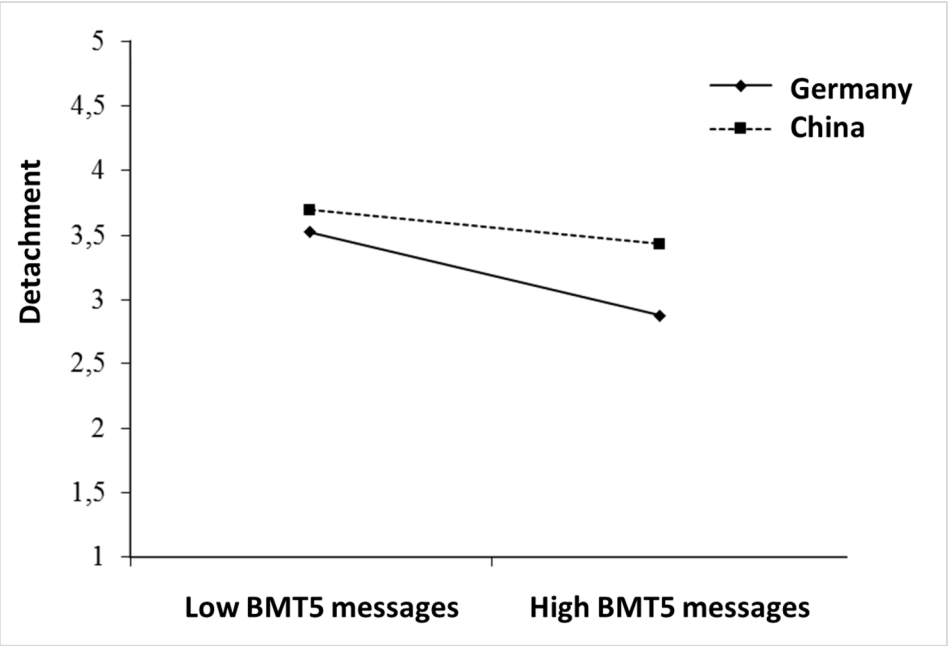

Figure 13. Effect of Nationality on the Relationship Between BMT5 (Replying to Messages) and Detachment

4.4 Discussion

4.4.1 Cultural Differences Between China and Germany Regarding the Work-Home Interface

The goal of this study was to contribute to research on the work-home interface by examining cultural differences between German and Chinese employees. Using samples of employees from the banking sector, we examined how Germans and Chinese segment or integrate their work and private life, how frequently they use ICT for work purposes after hours and how they make use of ICT-mediated boundary management tactics. In addition, we analyzed if Chinese and Germans differ regarding the effects of ICT use on wellbeing. Our results reveal significant differences between our two samples in how they shape the interface between the work and home domains in terms of segmentation or integration, some of which supported our hypotheses, some of which contradicted them. We also found that consequences of ICT use differed in the German and Chinese sample, indicating that Germans seem to suffer from other situations or circumstances than the Chinese. In the following sections, we will interpret the complex picture of results and develop theoretical and practical implications. In consideration of some study limitations, we also give directions for future research.

4.4.1.1 The Segmentation/ Integration of Life Domains and the Role of ICT Use

The segmentation/ integration of work and private life has evoked intensive research effort (e.g., Ashforth et al., 2000; Edwards & Rothbard, 2000; Nippert-Eng, 1996). Cross-cultural issues, however, have so far only been subject to theoretical assumptions (e.g., Aryee et al.,1999; Ashforth et al., 2000; Schein, 1984) but have not been empirically tested (see also Ollier-Malaterre et al., 2013; Powell et al., 2009). Thus, one aim of this study was to shed light on possible cultural differences between China and Germany regarding the segmentation/ integration of life domains and ICT use. Our study reveals a pattern of cultural differences that at a first sight seems contradictive. While the Chinese participants reported higher frequencies of ICT use after hours and used more integration-related BMT as expected, they at the same time indicate higher levels of segmentation preference and actual segmentation, which is not in line with the implications from previous research (e.g., Yang et al., 2000; Zhang et al., 2014).

There are several possible explanations for this latter unexpected result. Firstly, it is important to bear in mind the lack of measurement invariance for the segmentation preference and actual segmentation scales, which may have distorted the results due to systematic biases. It is possible

that with the same objective level of actual segmentation or segmentation preference, Chinese participants tend to choose higher ratings on the Likert scale due to how they understand the items (see also Chapter Limitations and Future Research).

Considering scale content, a closer look at the actual segmentation scale reveals that the items focus more on cognitive processes than on actual (segmentation-related) behavior. It seems possible that actual segmentation captures more of a state of being able to detach from work and leaving work mentally behind, rather than capturing behavior that relates to segmentation or integration. This assumption is supported by the high correlation between actual segmentation and detachment from work, which refers to a mental process as well (.66** in Germany and .55** in China). Thus, the measure of actual segmentation may not be a good indicator of segmentation-related behavior and cannot be seen independent from possible outcomes (detachment in particular). In consequence, it seems advisable to focus on the more behavior-related variables in this study (ICT-mediated boundary management tactics in particular) when drawing conclusions on behavioral differences as well as for examining potential effects on wellbeing and recovery.

In terms of segmentation preference, it seems important to more closely consider processes and causal relationships. First, it is interesting to note that the Chinese participants report to work longer and in general perceive a higher WHC and work-family guilt compared to the German participants (see Table 14). Thus, the Chinese might experience that they do not have (or are not able to enact) segmentation, which may increase the need or preference for it. Thus, the process and causal direction we implicitly assumed may actually be reversed: it is not segmentation preference or behavior that leads to a lower WHC, but a high experienced WHC may lead to a stronger preference for the opposite situation, namely a high segmentation. The same may apply for experiences of low satisfaction with WLB, low detachment and high work-family guilt. In addition, the Chinese participants in general engage more in ICT use, which again may lead to a preference for the opposite, namely segmentation with lower ICT use. Similarly, a generally low ability to detach from work may lead to a stronger need for segmentation – and subsequently to corresponding behavior. Unfortunately, in this cross-sectional study it is not possible to examine causal orders.

Another explanation for the unexpected results regarding segmentation preferences and actual segmentation may be drawn from research on cultural dimensions, which suggests that a careful look on the difference between the actual vs. the desired situations seems crucial. Kim and Markus (1999, p. 787) for example observe that “when cultural values are measured by explicit methods, participants often give responses that are contrary to those predicted”. One reason for this effect could be that when asked about their culture, participants tend to report their desired state rather than what

they actually observe (see also the distinction between cultural practices (as-is) and cultural values (as should-be) in the GLOBE study (House et al., 2004). Similar to these effects concerning culture descriptions, our participants might have reacted differently with respect to their own personal situation. It is possible that the Chinese participants in terms of both preferences and actual segmentation indicate a desired state that is characterized by more segmented life domains.

Thus, our study contributes to work-family research by further differentiating the meaning and relevance of widely-used constructs for cross-cultural purposes. Our results suggest that it is important to distinguish cognitive (e.g., the mental presence of work during private time as well as processes of psychological detachment), motivational (e.g., personal preferences, the role and meaning of work and the underlying reasons for ICT use) and behavioral aspects (the actual ICT use and boundary management tactics) of work-home interference. Those may come in different configurations and may be interconnected differently in the German or the Chinese sample. Our results indicate that while Chinese engage in ICT use after hours and integration-related BMT more frequently, they seem not to prefer an integration of life domains. This discrepancy seems to be linked to motivational factors such as an instrumental orientation towards work. Thus, causal relationships and processes might differ between the two samples (see suggestions for future research in the General Discussion)

4.4.1.2 ICT Use After Hours and ICT-Mediated BMT

The cultural differences in the frequency of ICT use after hours as well as the use of ICT-mediated BMT were found as hypothesized. More specifically, the results indicate that Chinese tend to engage more frequently in ICT use after hours (general frequency as well as *Continuing Tasks, Receiving Emails* and *Receiving Calls*). In addition, they made use of integration-related BMT more often than the Germans, who in turn had higher values in segmentation-related BMT. Those results contribute to the cross-cultural literature on the work-home interface, indicating how cultural values regarding the work and family domain may translate into actual behavior patterns. The higher ICT use in the Chinese sample is in line with characterization of the culture as more integration focused (Yang et al., 2000) and confirms the tendency to prioritize work for family (Zhang et al., 2014) on a behavioral level.

There is one exception to this pattern of results: for one of the integration-related BMT (*BMT4 Automatic Update*), we found higher values in the German sample compared to the Chinese.

This result shows that a higher proportion of the Germans participants compared to the Chinese automatically update their work-related messages on their private phones after hours. This does not correspond to the other BMT, which all show that the Germans engage more in segmentation-oriented tactics. One rather practical explanation for this finding could be different tools and functions used in both countries, leading to a different practical relevance of the automatic update function ("Push" function) in the first place. In China, the app "WeChat" is the most common communication channel for private, but increasingly also for work communication (Wei, 2017). Potential effects on WHC have been examined already (Liu, Zhang, Chen, Guo, & Yu, 2015). The wide distribution of this instant messaging tool also for work correspondence might make the question of activating or not activating the automatic push function obsolete in the Chinese sample, as an automatic message update is one of the key features of instant messaging. It is possible that the lower values in the Chinese sample regarding the statement "*I automatically update work messages on my devices*" (BMT4) is rather an expression of "this I not relevant for me" rather than "I do not actively activate the push function". These assumed differences in interpretation might have been fostered by the fact that in the German version of the questionnaire, we used the expression "push function" explicitly, but not in the Chinese translation.

All in all, our study sheds light on culture-specific ICT use patterns and boundary management tactics, largely confirming the assumptions drawn from research on work demands and on the work-home interface.

Besides the specific question of cultural differences, we also contribute to previous research by providing a fine-grained differentiation of ICT use after hours. On the one hand, we assess the general frequency of ICT use after hours, using a more objective answer scale (e.g., "a few times a week", "almost every day") compared to previous studies who use for example "intense" and similar more subjective ratings (e.g., Derks & Bakker, 2014). With the three events, we were additionally able to differentiate according to the form of ICT use.

In addition, we provide a new form of measurement of ICT-mediated boundary management tactics (BMT), which is based on the qualitative study by Sayah (2013). Our study provides only preliminary evidence on the construct validity of these items. We suggested that boundary management tactics could be divided in those that are related to the integration and the segmentation of life domains (see Chapter 4.1.3.2). The correlations between the tactics support this assumption only in part. There is for example a significant correlation between using separate devices (BMT1) and accounts (BMT2) (.36**/.34**), but not with BMT3 (switching off the work phone at home). Among the three supposedly integration-related strategies, we found that the tendency to reply to emails

(BMT5) is strongly related to replying to calls (BMT6) (.48**/.58**), but that those are related to BMT4 (Automatic Update) only in the German sample. Also, the expected negative correlations between segmentation and integration-related BMT can be only found in some cases. One reason for this may be the different levels at which the items operate. While some of them are personal strategies controlled by the individual (BMT3, BMT5 and BMT6), others are often controlled by the organization or are culture-specific practices, for example having separate devices (BMT1) or the use of accounts (BMT2) and functions (BMT4). In order to develop a valid and consistent scale, it is thus advisable to assess individual strategies in pure form by focusing on those items that are under individual control and separately ask for what the organization provides for and what is firmly regulated.

Taken together, while the BMT items that we used in this study may effectively be related to segmentation or integration behavior, they cannot be seen as indicators of one single construct and should not be used as one coherent scale. It seems worthwhile however to further elaborate individual strategies and develop a scale with consistent items in future studies.

4.4.1.3 The Cultural Context: Collectivism

In our study, we followed the call to take into account the cultural context and cultural values that may have explanatory power for cultural differences regarding the work-home interface (Ollier-Malaterre et al., 2013; Powell et al., 2009; Riordan & Vandenberg, 1994). We focused on collectivism, which has been suggested to be of particular relevance (Lu et al., 2006; Ollier-Malaterre et al., 2013; Ollo-López & Goñi-Legaz, 2015). As expected, we found in our study that Chinese more strongly endorsed the value collectivism, which is in line with cross-cultural research (e.g., Hofstede, 1997; Triandis, 1995). We further hypothesized that collectivistic values will be related to a lower actual segmentation and a lower WHC (see also Ashforth et al., 2000; Billing et al., 2014; Lu et al., 2006; Spector et al., 2007). However, those participants who were higher on collectivism tended to report higher actual segmentation and higher WHC in our study.

The scale we used may in part explain this unexpected result. First, it has to be taken into account that the reliability of the scale was not sufficient (Cronbach alpha was 0.63 in the German and 0.81 in the Chinese sample). Secondly, we adapted the items from Dorfman & Howell (1988) in order to make them more suitable for using them in work-family research (see section methods). As a result, the scale captures one specific facet of collectivism, namely the importance of the family. As such, the scale may measure a person's family centrality or family involvement rather than the general value

collectivism as it is defined by Triandis (1995) and Hofstede (1997). While in work-family research, family centrality is usually seen as a counterpart of work centrality (Carlson & Kacmar, 2000; Carr, Boyar, & Gregory, 2008), the cultural value collectivism is opposed to individualism, thus the centrality or importance of the individual. As such, people who agree to the statements in our scale put family welfare before individual needs and thus supposedly do not engage in behavior that is detrimental for the family. For this form of collectivism, the hypothesized relationships (Hypothesis 3) are less likely as compared to traditional concepts of collectivism that imply a wider definition of "groups" beyond the family (e.g., societal groups). Thus, the strategy to align the scale more closely to our research context did not turn out to work as we hoped, but came with major disadvantages as described. In future research, on the one hand it is advisable to more closely look at different measures of collectivism. On the other hand, also from a theoretical standpoint it would contribute to a further understanding of the role of collectivism to distinguish between different forms of collectivism. In the GLOBE study, the authors differentiate in-group-collectivism, which refers to "the degree to which individuals express pride, loyalty, and cohesiveness in their organizations or families", and institutional collectivism, meaning "the degree to which organizational and societal institutional practices encourage and reward collective distribution of resources and collective action" (House et al., 2004, p.30). Both forms are likely to be related to the interface between life domains, but in different ways: in-group collectivism on the one hand may be linked to a strong responsibility both for the family as well as for the work team and thus be associated with stronger feelings of guilt in the case of incompatible demands. Institutional collectivism on the other hand is associated with a strong interdependency with the organization as a whole (House et al., 2004) and thus may related to a stronger prioritization of the work domain and higher levels of work-home interference. Another distinction is offered by Billing et al. (2014), who state that collectivism can be divided into vertical and horizontal collectivism. The former means valuing interdependence, while at the same time differentiating oneself from others in terms of status. Horizontal collectivism, while also meaning strong interdependence, also includes valuing equality. Also this differentiation might be meaningful when considering the consequences of work-family interference, such as that with an orientation towards horizontal collectivism, feelings of guilt or injustice might be stronger. Taken together, it seems advisable to further differentiate cultural values of collectivism and examine their distinctive relevance for an individual's work-home interface.

Nevertheless, the finding that collectivism predicts higher actual segmentation is somewhat in line with our other results indicating that the Chinese participants report higher values in actual segmentation than the German sample (Hypothesis 2). Given that the Chinese are higher in collectivism (Hypothesis 1), both unexpected results point into the same direction, showing that the

Chinese participants, having collectivistic values, tend to segment – or wish to segment their life domains (see above for further interpretations).

4.4.1.4 Cultural Differences in the Effects of ICT Use on Wellbeing

Our analyses based on Hypotheses 4 and 5 revealed higher levels of ICT-mediated work after hours in the Chinese sample. However, even more relevant than differing frequencies or prevalence seems to be the question if the Chinese and the Germans experience different consequences of such behavior.

There have not been any studies before that focused on cultural differences regarding the consequences of ICT use after hours. However, cross-cultural research regarding the effects of general work demands as well as overtime yields ambiguous results, suggesting either stronger negative effects for Western cultures (e.g., Lu et al., 2006; Spector et al., 2004, 2007) or for Asian cultures (e.g., Yang et al., 2000). Based on the majority of empirical evidence as well as theoretical reasoning (see for example Zhang et al., 2014), we expected that for German employees, ICT use would be more strongly related to a decrease in wellbeing than for the Chinese.

We tested our hypotheses separately for different forms of ICT use after hours and different ICT-mediated BMT, as well as different wellbeing-related outcome variables. For several of our sub-hypotheses, we found significant interaction effects, some of which were as expected. However, several effects pointed in the opposite direction than initially proposed.

As expected, we found that with a higher intensity of replying to emails, detachment decreases for Germans more strongly than for Chinese, and WHC only increases for the German participants. In addition, when receiving calls after hours, detachment decreases for Germans more strongly compared to the Chinese. Thus, as expected, the German participants seemed to suffer more from such work correspondence than the Chinese participants. However, the underlying assumption that the overall level of detachment will be lower in the Chinese sample did not prove to be true (see Table 14). Thus, there have to be other explanations for the detachment-related interaction effects than previously assumed. Again, it seems possible that in the Chinese sample, reporting a high level of detachment reflects a desire for this state rather than an actual situation. This might explain the finding that detachment is less effected by ICT use in the Chinese sample.

For ICT frequency, however, we found the opposite: With a higher ICT frequency, WHC increases more strongly for the Chinese sample, the satisfaction with WLB even increases for the Germans, and work-family guilt increases for the Chinese, but not for the Germans. For the event *Continuing Tasks* we found only limited evidence for cultural differences regarding its effects, also pointing into the same direction: only the Chinese perceive a lower WLB when they report that they often continue tasks at home. Thus, in the case of ICT frequency and *Continuing Tasks*, the Chinese participants seem to suffer more, Germans less or they even gain from it. Zhang et al. (2014) also point at potential downsides of the Chinese approach to prioritize work for family. They suggest that this orientation may be related to depression and burnout eventually (Zhang et al., 2014). Thus, even though the overall sense or feeling of an interference of life domains or an incompatibility of roles may be less widely distributed in China, they might still suffer from the same negative consequences and risk of long-term health problems (see also Zhang, Griffeth, & Fried, 2012).

In addition, Zhan et al. (2014) observe changes in the Chinese society, with the younger generation in particular becoming more individualistic, valuing personal goals higher, which they mention as an explanation for study results in China that are similar to Western cultures. Also in our study sample, it is possible that more Western orientations were prominent, explaining in part the results of higher WHC and lower WLB in the case of ICT use.

With a closer look at the results, there seem to be two groups of ICT use variables with different effect patterns: The event *Receiving Calls* as well as *BMT5 (Replying to Messages)* both involve direct communication with others and intrusions of work contacts into private life. As those intrusions seem to be more detrimental for German participants, it is possible that for Germans being contacted is particularly negative. This is also in line with the results from Study 1B and 2, showing also more negative consequences for emails (with communication) compared to continuing tasks (usually without communication). In contrast to emails and calls, the other two variables in this study (ICT frequency and event *Continuing Tasks*) do not (necessarily) involve communication to others. It is possible that when answering to those items, Germans more often thought of how they gain flexibility and are able to better balance work and private life as they may at least be with their family when working from home. It is possible that they also included home office hours in their considerations of the frequency of ICT use, which for them may be a flexible work design with more benefits than costs. In addition, these forms of ICT use are more self-initiated and autonomously motivated compared to emails or calls, which has been shown an important condition for less detrimental effects in previous studies (e.g., Ohly & Latour, 2014). All those studies were conducted with samples from Western cultures. Our results suggest that for Chinese participants, other mechanisms seem to be important:

they do not seem to feel the same gain from working from home. It is possible that this is due to differences in work arrangements or the prevalence and organization of home office work. Long, Kuang, and Buzzanell (2013) found in a qualitative study on Telework in China that although the employees they interviewed evaluated telework positively, they found it particularly challenging to cultivate "guanxi". Guanxi means "establishing and nurturing connections in order to secure favors in personal relationships" (p. 256) and constitutes a crucial element of the Chinese business environment. Thus, Chinese participants may be more ambivalent about telework/ home office than the German participants. Unfortunately, this may not be answered more concretely based on our data. Thus, in future research it is advisable to more clearly differentiate in which setting ICT use after hours takes place (payed home office hours or free time) and to further explore the cultural evaluation of home office and ICT use after hours.

4.4.2 Limitations and Future Research

4.4.2.1 The Role of Measurement Invariance and the Importance of Culture-Sensitive Constructs and Measures of Work-Home Interface

A severe limitation of this study is the lack of measurement equivalence for several of our scales. It has to be carefully considered which effect or relevance the lack of invariance for each scale has for the interpretation of our results. Many researchers tend to consider measurement invariance as a major threat to their study and either eliminate the scales concerned or abandon the comparative study completely (Cheung & Rensvold, 1998). However, those rigid approaches have been questioned recently and it has been proposed that the existence of non-invariance has different implications depending on the study approach. In cross-cultural studies, the non-invariance of intercepts for example may indicate systematic biases that may be driven by cultural norms. A lack of invariance may indicate that items are interpreted differently due to the cultural background or that the same level of a given construct may be considered as higher or lower depending on culture-specific experiences and or values. Cheung and Rensvold (1998) argue that in cross-cultural analyses, non-invariant items turn up frequently and may be retained under certain circumstances, as differences in item responses may be meaningful (for example caused by different cultural values) and thus valuable to be interpreted. They note "that non-invariant items may represent important, and sometimes the only, sources of data concerning between-group differences" (p. 94).

In addition, Welzel and Inglehart (2016) state that the predominant "notion of equivalence is fundamentally flawed" (p. 1068) as it fixates on internal convergence of items as a prerequisite for using item indices. They argue that for external linkages (for example relating a construct to antecedents or outcomes), inter-item convergence is not necessarily required. Thus, in our study, for all scales that are not part of mean differences analyses (namely Work-family Guilt, Satisfaction with WLB, Detachment), non-invariance of item intercepts can be seen as less detrimental. Secondly, Welzel and Inglehart (2016) argue that inter-item convergence is a misleading standard of measurement equivalence in the case of formative constructs. For those scales with a combinatory rather than a dimensional logic, full measurement equivalence as usually conceptualized cannot be expected. This argumentation may explain the lack of invariance in the case of satisfaction with one's own WLB. The related items capture temporal aspects, attention or balancing needs, which all together are indicative of work-life balance, but which are not interchangeable. It is possible that Germans and Chinese attribute a different relative importance to the respective facets, which means that configural equivalence is not to be expected in the first place. Still, differences in the overall value (scale mean) maybe be meaningful or even comparable.

Based on those argumentations, we decided to proceed with the testing and interpretation of our hypotheses. Nevertheless, for the interpretation of group mean differences in segmentation/ integration (Hypothesis 2), it is important to note that the scale for actual segmentation in particular lacked measurement invariance, but also segmentation preference did not proof to be invariant in terms of intercepts. Thus, the group mean values may not be fully comparable across both groups. Other researchers have emphasized possible biases due to culture-specific item interpretation (Aycan, 2008; Powell et al., 2009; Shaffer et al., 2011; van de Vijver & Tanzer, 1997) or culturally determined response styles (Spector et al., 2015). For example, van Steenbergen, Ellemers, Haslam, and Urlings (2008) showed how the cognitive appraisal of work-family interference is culture-bound. Also Zhang et al. (2014) argue that scales that they were developed under Western assumptions are not necessarily applicable in China. They use the example of WF centrality scale in Carr et al. (2008), with the sample item "The major satisfaction in my life comes from my work rather than my family". Zhang et al. (2014, p. 22) indicate that "for Chinese employees, an emphasis on work may not imply that the major satisfaction in their life comes from their work. […] Because Chinese employees tend to view work as an important means to achieve an overall benefit for the family, a Chinese respondent may give a low score to the sample item, but be highly committed to his or her work."

In order to capture those differences in item and construct interpretation adequately, future studies should use qualitative approaches as additional steps. These methods have been largely

neglected in testing construct and measurement equivalence in cross-cultural WF research; but have a long tradition in medicine and health research (e.g., Collins, 2003). Two methods are widely used there: Focus Groups to get initial hints of construct perception (e.g., Hughes & DuMont, 1993), as well as cognitive interviews mainly when it comes to assessing item interpretation (e.g., Nápoles-Springer, Santoyo-Olsson, O'Brien, & Stewart, 2006). Ideas from these research branches might be adapted to develop new methods for testing construct and item interpretation, looking at uninfluenced reactions and associations. For example, a promising option could be the use of scenarios, which the participants have to rate according to, for example, the level of segmentation/ integration. This would allow for an examination if the same situation is being appraised differently depending on the culture.

Further approaches to avoid cultural biases in item interpretation or responses could be to put more emphasis on face validity (Nevo, 1985): testing items for face validity across cultures might help to make sure items are interpreted similarly. Another possibility to consider would be implicit measures as proposed by Kim and Markus (1999) to avoid biases that are caused by more or less conscious culture-specific evaluations.

4.4.2.2 Causality, Alternative Explanations and Process Factors

Another limitation is that in our two-country cross-sectional design, it is not possible to determine why observed differences may have occurred. In this respect, it is important to emphasize the non-equivalence of the two samples in terms of most demographic variables (see Chapter 4.3.2). It seemed likely that the family status, the existence of children and the management level are relevant with respect to our analyses. We found, however, only working hours to be a significant covariate. Even though we controlled for demographic variables, there are still several other influence factors that may have affected our results (see below).

It is also important to note that the results in this study are not comparable with those from our diary studies (Study 1 and 2). In those studies, we were able to relate the concrete occurrence of ICT-related events or the duration of ICT use on a specific day to our outcome variables. In the present, cross-sectional study, we are only able to analyze if a person who in general engages more frequently in ICT use after hours suffers from certain negative effects on wellbeing. This study design does not allow for confident causal conclusions, for example regarding the direction of effects. We already discussed potential reversed effects above (the possibility that WHC might be the cause of a higher

segmentation preference). For future research, it seems advisable to look more closely at the causal relationships and processes as well as related cultural differences.

In our study, we assessed the cultural dimension individualism/ collectivism as a potential underlying explanation for cultural differences in the perception and handling of the work-home interface. Even though this cultural dimension has proven to be a powerful value framework that is influencing the work-home interface greatly (Lu et al., 2006; Ollo-López & Goñi-Legaz, 2015; Spector et al., 2007), there are other cultural values and dimension that are likely to be of relevance. Particularly important might be the dimension specifity/ diffusion (Hampden-Turner & Trompenaars, 2000; Trompenaars, 1993), as it directly refers to the work-home interface. It suggests that cultures differ in terms of how they segregate work and family roles. “Specific” means that a person integrates others only in specific life domains, meaning that work and family relationships are kept separate. “Diffuse” means that others are let into various life domains, meaning to integrate the life domains. Trompenaars (1993) found for China a diffuse and for Germany a specific approach. In previous studies, propositions have been made on the role of this cultural dimension as a predictor or moderator in cross-cultural studies on the work-home interface (e.g., Luk & Shaffer, 2005; Ollier-Malaterre et al., 2013; Powell et al., 2009). However, there are no empirical studies using this cultural dimension. A main reason for this negligence is the lack of a scale for this cultural dimension that can be used on an individual level to measure the respective cultural values. Developing a scale might help to further tap into cultural values that may account for potential cultural differences in the work-home interface.

Apart from those cultural values, there are many other factors that distinguish Germany and China from each other. For example, differences in economic and political factors are likely to affect the dealing with work demands (Spector et al., 2007). Also, Joplin et al. (2003) showed that in societies where macro-environmental changes (economic, social, technological and legal factors) do not match the predominant cultural values, individuals experience more stress.

In addition, national policies regarding work arrangements in general and the balancing of work and family in particular are important (Kassinis & Stavrou, 2013; Lewis & Den Dulk, 2009). In this respect, studies drawing on social justice theory give further insights. For example, Lewis and Smithson (2001) examine cultural differences regarding the sense of entitlement to support for the reconciliation of work and family life. They find that the sense of entitlement to support from the state and for employer flexibility in terms of working hours differ between European countries. It would be interesting to explore this issue in Germany and China as a possible explanation for our finding of positive effects when working from home in the German sample: it is possible that Germans, more

than Chinese, perceive home office as employer support that they are entitled to, which would make home office more positively connoted.

As an additional perspective, factors on the organizational level as well as the respective industry should be considered. It has been shown before that organizational culture plays a crucial role when looking at phenomena related to the work-place (Deal & Kennedy, 1982; Schein, 2004; Schneider, 1988). In our study, we questioned people from different banks in order to rule out effects of company culture. However, the specific settings of the banking sector could be important for our data as well. Depending on the specific job a person holds, the requirement to be available outside working hours might be lower in banking compared to other industries. It would be worthwhile to also question employees in other industries such as service and counseling or IT, where flexibility in space and time might be even more popular.

In addition, family-related values may explain culture-specific reactions and behaviors. For example, the size of the family unit employees live in is higher in collectivistic cultures (Specter et al., 2007). In their study, they examined if a higher domestic support could be an explanation why in collectivistic countries, work demands are less strongly related to the level of work-family conflict. Even though they did not find the proposed effects, the role of domestic support has been shown in other studies before (e.g., Hassan et al.; 2010, Zhang et al., 2014).

Another important question is the role of norms and expectations. In Study 2, we were able to show the importance of organizational expectations to be available and respond to messages after hours. It is possible that the Germans and the Chinese differ in how strongly they act according to implicit norms and expectations. There is first empirical evidence that cultures do differ in their conformity towards norms (Kim & Markus, 1999). Future research should analyze the role of organizational expectations regarding ICT use across cultures.

Lastly, in the context of the assessment of cultural differences, it is important to bear in mind that in our study, we did not ask the participants if they were originally from another cultural background than the Chinese/ German. Thus, it is possible that there were also immigrants who were socialized in another culture, which may have distorted our results. Thus, in future studies it is advisable to include this question in the questionnaire either in order to exclude respondents with another cultural background or to control for it.

4.4.2.3 Culture-Specific Habits and Motivations of ICT Use

When studying ICT use and its consequences, it is important to consider aspects of self-regulation as well as habitual processes. Non-intentional, habitual or reactive behaviors seem to be particularly relevant in terms of ICT use, where user intentions might collide with habitual behavior (general literature on the relevance of habits see Neal, Wood, & Drolet, 2013; Wood, Quinn, & Kashy, 2002; literature on habits in ICT usage see Oulasvirta et al., 2012; Polites & Karahanna, 2013). Those habits and ICT use motivations are likely to vary between cultures, as they are shaped by the specific societal surroundings. While again most research has been conducted in the US, the are some studies in an Asian context: Li and Lin (2016) look at smartphone dependency among young Chinese adults. Fujimoto, Ferdous, Sekiguchi, and Sugianto (2016) examined the effect of (mobile) ICT use on work engagement and emotional exhaustion in Japan. They found that ICT use was positively related to work engagement, which seems to be atypical compared to previous studies. They explain that "Japanese workers tend to use MT [Mobile technology] rather enthusiastically […] and are invigorated by MT, through exercising greater job autonomy and greater work engagement, despite MT blurring the boundary between work and nonwork hours and activities." (p. 6). This initial evidence regarding culture specific motivations should be further pursued and it should be examined for example if the role of autonomous motivation as found by Ohly and Latour (2014) holds the same across cultures.

4.4.3 Practical Implications

From our results, initial practical implications can be drawn. It seems advisable for international banks and other companies to be aware that work-family related practices such as flexible work arrangements may be evaluated differently in Western and in Asian countries and that they may not always have the intended effects (e.g., a reduction of work-home conflict) across all cultures. It is important to tailor programs and services to the specific cultural context in order to match cultural values, beliefs and motivations (see also Powell et al., 2009). In this respect, our study suggests that behaviors and motivational processes are not necessarily linked in the same way across cultures. Thus, it may be advisable for companies to more closely examine why employees at a specific site engage in certain practices (e.g., ICT use or BMT) and which goals they pursue instead of rolling out practices and regulations uniformly on an international level. For example, our results suggest that Germans feel particularly disturbed by contacts (emails and calls) outside office hours, thus it seems advisable to limit such practices in a German context and establish transparent and clear availability

rules. In the Chinese context, it seems important to scrutinize evaluations of home office and telework when implementing such flexible work arrangements.

Due to cultural differences found in this study as well as previous research, it is important for international organizations to offer cross-cultural training to their employees, helping them to get aware of cultural differences and better understand the perspective of colleagues from other cultural backgrounds.

5. General Discussion

5.1 Summary and Theoretical Contributions

In times of changing work conditions and advancing technology, work seems to be increasingly boundless in time and space and many employees struggle in balancing their work and private life. In this respect, Information and Communication Technology (ICT) is helpful by allowing for an increased flexibility and efficiency, but also causes intrusions between life domains and thus endangers employee wellbeing and recovery. The aim of the studies included in this dissertation was to contribute to our understanding of the role of ICT use for work and private life as well as its effects on employee wellbeing and recovery. In our studies, we followed the call to address the double-edged sword character of ICT use (e.g., Day et al., 2010; Demerouti et al., 2014; Korunka & Hoonakker, 2014) by examining influence factors on the individual, organizational and cultural level that define when ICT use turns into a beneficial or detrimental experience.

5.1.1 Consequences of Work-related Information and Communication Technology Use During Non-Work Time (WINT)

Across all studies compiled in this dissertation, we found evidence for detrimental effects of work-related ICT use after hours on employee wellbeing and recovery. In Study 1, we discovered that work-related ICT events in the evening were particularly salient and relevant for employees (Study 1A) and significantly affected recovery (Study 1B). Work emails seemed to be the most detrimental form, impeding on both detachment and sleep quality. With this differentiation of the forms of ICT use, we extend previous studies that have examined effects of ICT use or smartphone use in general (e.g., Derks & Bakker, 2010, 2014; Derks et al., 2014; Park et al., 2011). In addition, our results contribute to boundary theory (Ashforth et al., 2000) by showing which specific boundary crossing situations employees experience on a daily basis, which of them are evaluated as beneficial or detrimental, and which of them are related to positive or negative effects on recovery. We found only little evidence for positive effects of ICT use. This may in part be caused by our study design (see discussion on Study 1), but it seems to be also indicative of a predominance of detrimental effects. Thus, in line with many recent studies, our research in Study 1 and 2 gives further evidence for the potential pitfalls of a behavior that more and more employees engage in.

In Study 2, we found that in some cases the negative effects of ICT use are even more severe (or do occur only) when organizational expectations regarding availability, response times or times

sacrifices are high. We extend previous research on organizational norms or expectations (e.g., Derks et al., 2015; Kreiner, 2006) by differentiating three facets of organizations expectations (availability expectations, response time expectations, organizational time demands) and their unique relevance in the case of different forms of ICT use. Thus, Study 2 gives further evidence for the relevance of organizational factors, which have been identified as an important level to be considered in previous studies (see also Derks et al., 2014; Derks et al., 2015).

In Study 3, we addressed the cultural level and showed how ICT use and its consequences differ between German and Chinese employees. We found that the effects of ICT use after hours and ICT-mediated boundary management tactics are not the same for Chinese and German participants with stronger or weaker effects for both groups depending on the specific form of ICT use. We thus extend previous studies on cultural differences in the segmentation or integration of life domains (e.g., Yang et al., 2000; Zhang et al., 2014) by showing how cultural values may (or may not) translate to a behavioral level and by giving evidence for a differentiated pattern of cognitive, motivational and behavioral aspects. Our results suggest that when focusing on only one of these, researchers would not get the whole picture and risk certain biases. In addition, the results of Study 3 contribute to boundary theory by suggesting that Germans and Chinese may have different feelings towards work-life boundaries, the desired level of boundary permeability and the specific role of ICT use.

Taken together, our research contributes to theory and empirical research on ICT use by further differentiating the consequences of different forms of ICT use on wellbeing and recovery and by showing how these consequences depend on organizational expectations and the cultural background.

5.1.2 ICT Use as a Demand or a Resource

Given its both enriching as well as detrimental character, ICT use can be conceptualized as being either a demand or a resource for employees (Day et al., 2010; Ďuranová & Ohly, 2016). Also the results of the studies in this dissertation can be viewed through the lenses of the Job-Demands-Resources Model (Bakker & Demerouti, 2007; Demerouti et al., 2001). In Study 1, we asked our participants if they encountered positive/enriching or negative/stressful ICT-related events, and their statements give evidence for situations where ICT use is viewed as a resource or as a demand respectively. Previous research has focused on the demanding character of ICT, while there is a lack of comprehensive studies on the role of ICT as a resource. In our studies, we consider both sides, offering

a new perspective on the role of ICT as both a demand and a resource in concrete day-to-day experiences. We found that while employees might appreciate flexibility and control over when and where they work, they often underestimate potential downsides regarding wellbeing and recovery. However, it is possible that a broader perspective on the effects of ICT events as a resource, including more immediate effects as well as additional outcomes such as job motivation or performance, might yield more positive effects. For example, it is possible that for the achievement of goals on a given day, ICT may be a valuable resource despite potential longer-term negative effects. Also, while ICT use in the evening may be detrimental for wellbeing, it may be related to a higher overall performance and may be rewarded accordingly by the organization.

Study 2 in this dissertation suggests that the demanding character of ICT use may be intensified by a high level of organizational expectations regarding availability. In addition, Study 3 shows that Germans and Chinese differ in which forms of ICT use they perceive as demanding or as a resource. Thus, we contribute to the perspective of ICT as a demand or a resource by showing that it depends in part on the specific form of ICT use, on the expectations of relevant others as well as on the cultural background if and to which degree the demanding or the beneficial character of ICT use is dominant.

In our studies, we were also able to offer some evidence for the differential demanding role of ICT use beyond more general work demands. We thereby follow the call of Ďuranová and Ohly (2016) to additionally assess general workload or work time in order "to be able to examine the extent to which the effects of TASW [Technology-assisted supplemental work] are incremental to this established work demand" (p.94). In Study 2 and 3, we controlled for time pressure and/ or working hours and found incremental effects of ICT use beyond those measures of work demands. With this, we were able to show the necessity of disentangling general workload or overtime and specific ICT-related activities.

Future research should further explore the role of ICT use as a demand or resource. The role as a resource in particular is not yet fully understood: it is possible that ICT use may directly improve recovery or wellbeing on the one hand and performance on the other hand. It may also have indirect effects by reducing work demands or it may buffer the demand-strain relationship (see also Ďuranová & Ohly, 2016). Futures studies should look more closely on those processes and try to disentangle potential positive (and also negative) consequences in terms of what exactly determines those effects.

In addition, a further distinction of demands according to the challenge-hindrance framework (Cavanaugh, Boswell, Roehling, & Boudreau, 2000) seems promising. The distinction

between hindering and challenging stressors might explain some of our results. For example, in Study 1B, it is possible that while all negative ICT events might be perceived as stressors and thus be reported as a negative event, only some of them act as hindrance stressors (in particular the negative evening events *Continuing Tasks*, *Work Calls* and *Work Emails*) and actually unfold their negative consequences on wellbeing and recovery. Similarly, Ďuranová and Ohly (2016) hypothesize that "TASW [Technology-assisted supplemental work] may be appraised as a challenge demand in anticipating its straining as well as resourcing characteristics. Otherwise, TASW may be appraised as a hindrance demand when anticipating only negative experiences while doing it" (p. 93). Thus, in future studies it could be worthwhile to develop measures regarding the evaluation of ICT use as a challenge or hindrance stressor in order to differentiate its specific role.

5.1.3 Operationalization of ICT Use

With all of our studies, besides the literal research questions, we also aimed at contributing to the literature by extending previous approaches of the operationalization or measurement of ICT use. In Study 1A, we identified typical ICT-related affective events that occur on a daily basis, thus accounting for daily fluctuations of stressor exposure (Ganster & Rosen, 2013). Used as a checklist in diary studies as in Study 1B, our newly developed taxonomy allows for examining the prevalence of ICT-related stressful or enriching events as well as potential fluctuations over time including accumulative effects (Ganster & Rosen, 2013). The event taxonomy provides a more fine-grained approach of specific ICT events and, given the distinctive effects of different forms of evening ICT use on recovery, contributes to the refinement of the operationalization of ICT use after hours beyond frequency or duration for future analyses of ICT impacts (see also Butts et al., 2015; Dén-Nagy, 2014; Ďuranová & Ohly, 2016). We conceptualized our events as affective events with positive or negative valence in Study 1 and as neutral events in Study 2. Both seem to be promising approaches that should be further pursued. In future studies it could be helpful to distinguish more clearly between event occurrence and its valence on a daily level to allow for a specification of the role of individual evaluation and appraisal.

In Study 2, we further differentiated ICT-related events and the daily duration of ICT use. With this approach, we add to previous results by going beyond an assessment of the subjective intensity of ICT use by including both the nature and the more objective duration of work-related ICT use after hours.

In Study 3, we provided a quantitative measure of ICT-mediated Boundary Management Tactics, which was adapted from the qualitative study by Sayah (2013). While in Study 1 and 2 we assessed how long and in which form (email, call or other tasks) a person engages in ICT use after hours, Study 3 aimed at capturing the active strategies or tactics a person applies. Those tactics include how the person handles work or private communication accounts and messages and how the person reacts to incoming emails or calls during private time. The newly developed items need to be further refined in order to provide for a measurement of personal integration- or segmentation-related tactics. Also, the wording of BMT 4 (Automatic Update) should be more clearly aligned in both languages to avoid misunderstandings (see Chapter 4.4.1.2). In addition, the items have of course yet to be tested in larger and more representative samples in order to give evidence for the reliability and validity of the measure.

5.2 Directions for Future Research

In our studies, we examine several factors or conditions that are important in terms of ICT use consequences. We provide evidence for the importance of the individual situational evaluation (Study 1), of the different forms of ICT use (all studies), of organizational expectations (Study 2) and cultural factors (Study 3). However, our results together with previous studies are only a first step in explaining the complex network of consequences – and antecedents – of ICT use in the work-home interface. Hence, there has yet to be significant research effort to shed light on further influence factors and surrounding conditions. In the discussion sessions of the three studies, manifold explanations and assumptions together with the limitations of our studies were offered. In the following chapter, I will draw back on the most important issues with the goal of condensing and further developing the factors that were found to be relevant and that should be (further) explored in future research. Those factors fall into four categories, emphasizing four levels or perspectives that should be further examined in particular, namely the process, the person, the life domain and the system perspective.

5.2.1 The Process Perspective

In order to understand the underlying mechanisms of the relationship between ICT use and wellbeing or recovery, it seems crucial to take a process perspective. This means that besides the examination of immediate effects on a daily level, it is important to consider also long-term effects as well as potential variations over time. In addition to that, process-oriented approaches focus on temporal dynamics and the separation of antecedents and consequences, thus helping to better understand causal relationships.

In the case of ICT use, long-term effects should be more closely considered beyond effects on the daily levels as examined in our studies (see also discussion Study 1 regarding the importance of cumulative interruptions). Related to this question, Spieler, Scheibe, Stamov-Rossnagel, and Kappas (2017) found for example that whereas occasional flextime use has positive consequences, chronic flextime use seemed to undermine work goal achievement. Similarly, it is possible that with an occasional work-related ICT use in the evening in proper doses, benefits predominate, while negative consequences in particular come along with a regular use. Future studies should more clearly differentiate between short-term and long-term consequences and thus provide for a more in-depth understanding of the overall process, which also helps practice to better estimate potentially conflicting immediate or long-term costs and benefits.

Apart from those longer-term effects, variations over time are likely to occur. For example, with important life events (such as a new job or the birth of a child), individual preferences, priorities as well as boundary management tactics etc. might change (see also Sayah, 2013). Those potential instabilities should be considered in longitudinal studies, not only as those results may help practitioners to develop support services for such transition phases.

Thirdly, causal relationships should be more closely examined. The diary approach in Studies 1 and 2 allowed us to relate the occurrence of singular ICT-related events or the duration of ICT use on a specific day to our outcome variables. However, only in some cases independent and outcome variables could be separated in time, which made causal interpretations as well as process-related conclusions difficult. In the discussion sections of Study 1 and 2, we speculated about the role of rumination as an important process variable involved in the phenomena under examination. We suggested that the reason for detrimental effects of ICT use after hours on recovery is an increased rumination, i.e. incessant thoughts about work (Cropley & Zijlstra, 2011). Affective rumination in particular predicts an increase of exhaustion over time (Firoozabadi et al., 2016) and thus seems to be an important concept to consider. Future studies should further explore how different forms of ICT

use in the evening are related to affective or problem-based rumination and examine the potential mediating effects of rumination (or detachment on the contrary) on recovery or wellbeing.

With the cross-sectional approach in Study 3, we were only able to analyze if a person who in general engaged more frequently in ICT use after hours suffered from certain negative effects on wellbeing. This study design does not allow for confident causal conclusions, for example regarding the direction of effects. We already discussed potential reversed effects in the discussion section of Study 3, for example the possibility that the experience of work-home conflict might be the cause of a higher segmentation preference. In another study, there is initial empirical evidence that also in the case of ICT use after hours, causal relationships might not be as previously assumed. Heißler and Ohly (2017) find support for a reversed causal effect, meaning that insufficient detachment may lead to work-related ICT use after hours. This result suggests that antecedents and consequences of ICT use are often interdependent. For future research, it seems advisable to more closely look at causal relationships and the processes behind the effects that were found.

When examining dynamic processes of the consequences of affective events in particular, it seems worthwhile to consider an event's affective strength. Warr and Inceoglu (2014) explain that "a stimulus that generates feelings of intense pain or extreme delight is likely to have a clear and similar impact on everyone, having considerable affective strength and overwhelming the influence of personal characteristics. On the other hand, an input from the environment which allows a range of different evaluations (i.e., is of low affective strength) is expected to permit more impact from personal variables" (p. 4). Examining the affective strength of ICT-related experiences might help to predict when personal (or also cultural) factors are likely to be important and when they are not. For example, it is possible that a technology breakdown is a negative event with a strong affective strength, which will be perceived similarly across individuals and cultures. A phone call from a colleague in the evening, however, seems to be more ambiguous, which may be inferred from the fact that in our studies, the consequences of such events were less consistent. This may in part be explained by a lower affective strength, which in consequence suggests that individually different interpretations and reactions are likely to occur.

Another important process factor is the pursuit or achievement of individual goals. As ICT can be a means that may support goal achievement, it seems important to more closely look at the relationship between ICT use and goal pursuit as well as the question if goal achievement might have a moderating or mediating effect on the relationship between ICT use and recovery and wellbeing. In this respect, goal attainment via ICT use may be conceptualized as a positive affective event itself that fosters positive experiences or positive effects when using ICT for work purposes after hours (see also

Ohly & Schmitt, 2015). Empirical evidence for the role of goal achievement as a mediator is for example provided by Spieler et al. (2017). They find that day-specific non-work goal completion acts as a partial mediator of the link between flextime use and boundary strength at work. They suggest that flextime use may strengthen the employees' boundaries at work by allowing them to finish non-work goals before transitioning back to work. Future studies should examine if positive effects are observable more frequently in case of successful goal achievement in the respective situation. Most likely, the link between goal pursuit or achievement and need satisfaction is relevant in this respect and should thus be further considered (Deci & Ryan, 2000).

5.2.2 The Person Perspective

In our studies, we focused on daily variations and within-person processes (Study 1), the influence of the organizational environment (Study 2) as well as cultural factors (Study 3). Although we mentioned person-level variables at several points (e.g., in the form of control variables or in the form of integration/ segmentation preferences in Study 3), dispositional variables were neglected in our studies after all. It is, however, very likely that person-level variables are highly relevant in terms of the perception of the work-home interface, in terms of behavior and in terms of stress and wellbeing. On a dispositional level, career ambition, organizational commitment or workaholism may be important person level antecedents of ICT use, but also moderating factors that may influence its effects on wellbeing (see also Ďuranová & Ohly, 2016). Allen et al. (2012) find in a meta-analysis that overall, negative trait variables as for example negative affect or neuroticism seem to increase the vulnerability to work-family conflict. Positive trait variables such as positive affect and self-efficacy however seem to act as a buffer. Future research should examine the role of such dispositional variables also with regard to the consequences of ICT use.

In addition, it should not be underestimated that ICT usage behavior is in many cases habitual or even compulsive. It is likely that a significant share of ICT use is not motivated by either intrinsic or extrinsic incentives. It often seems to be an automatic or habitual behavior. For example, one study found that 70% of the employees read incoming messages within six seconds, and 85% within two minutes (Jackson, Dawson, & Wilson, 2003). Therefore, future research should consider usage patterns including unconscious habits as well as addictive patterns. There is evidence that smartphone or email addiction is a frequent problem nowadays (e.g., Lapointe, Boudreau-Pinsonneault, & Vaghefi, 2013; Vaghefi & Lapointe, 2014). For employees with addictive tendencies, the engagement in ICT use and the relationship between ICT use and wellbeing may be driven by different factors compared to

employees who engage in ICT use deliberately and tactically. Thus, it is important in future research to differentiate if ICT use is self-initiated, a reaction to work intrusions or organizational expectations, or a habitual, non-goal-directed action.

Lastly, the specific job is likely to have a large influence on how a person shapes work-home boundaries and engages in ICT use. For example, behavior and experiences depend on the job's requirements to be available or to respond quickly to customer requests, the necessity of exchange and coordination with others etc. Thus, future research might examine ICT use patterns in different jobs and how those job-specific patterns affect recovery and wellbeing.

5.2.3 The Life Domain Perspective

Previous research – and the studies in this dissertation alike – apply a two-dimensional approach to their research effort to understand the interplay between life domains. In most studies, work life is opposed to family life, thus restricting the non-work area to family-related activities and responsibilities. Several researchers have argued that it is important to broaden the perspective to include other life domains (e.g., Carlson & Kacmar, 2000; Crooker, Smith, & Tabak, 2002; Kreiner, 2006; Stock, Entringer, & Bieling, 2014). In our studies, we used "home domain" as a counterpart to work in order to also include employees that may not have a family. It seems, however, advisable to not only use broader, more inclusive concepts, but also to further differentiate different sub-areas of the private, but also the work domain.

Regarding the private domain, future research should consider what a person actually does in the free time (e.g., family activities, sports, cultural activities, or nature experiences) in order to better understand why in some situations, the same work intrusion might have different impacts. In recovery research, there has been significant effort to examine the distinctive contribution of different leisure activities to recovery and wellbeing (e.g., Sonnentag, 2001). These findings, however, have not yet been applied to the research on the interference between life domains. Sonnentag (2001) found that low-effort activities, physical activities and social activities had positive effects on situational wellbeing, while household and child-care activities were unrelated to wellbeing. It would be interesting to examine if for example work intrusions are less detrimental on evenings where a person is primarily engaged in household activities than on evenings where he or she meets friends.

In addition, private time should be further distinguished in weekday leisure time, weekend leisure time and holidays. It is likely that both recovery experiences as well as effects of intrusions

differ between those areas of free time. For example, Fritz and Sonnentag (2006) found that negative work reflection during vacation was related to lower levels of wellbeing after vacation. Similarly, Kirillova and Wang (2016) examine the role of the omnipresent connectivity for tourist experiences during vacations. In our diary studies, we only collected data on working days, as we focused on short-term dynamics during and after work. It seems worthwhile to expand the scope of such studies on the weekend or holidays in order to further differentiate effects of ICT use. For example, it is possible that the positive side of availability and flexibility that ICT offers is predominant in the evenings of weekdays, but becomes less important on weekends or holidays, where negative side effects might prevail.

Stock et al. (2014) further emphasize that it is important to distinguish between role-prescribed life activities and "self-time". The latter describes activities that a person engages in on free will and not for fulfilling specific role expectations. They argue that self-time activities in particular "fulfill important personal needs and thus decisively shape individuals' perceptions of work-life balance" (p. 29). Thus, it is likely that self-time is particularly sensitive to disturbances.

In addition, also regarding the work domain, a more differentiated conceptualization is advisable and at the same time difficult to achieve. For example, our event taxonomy in Study 1 showed that employees differentiated between disruptions during the regular workflow, during meetings, or on the way when they travel to or from work. However, in our studies, we were only in part able to actually differentiate work from private time and to define if a certain time, for example when a person engages in ICT use at home, is counted as working time or not. We had to rely on the person's individual evaluations. In future studies, it should be clearly differentiated between work and private time and between different work settings.

In this respect, it is important to bear in mind that work-related ICT use that is reported in scientific studies is always embedded in a specific (individual or organization-wide) work arrangement. It is likely that the respective work-design is highly important for the consequences or side effects of work-related ICT use. Previous studies have examined the specific circumstances of different types of work arrangements, such as the influence of the work venue (traditional office, virtual office, and home office) on work and personal life (e.g., Hill et al., 2003). In addition, the particular situation of teleworkers or flextime users has been considered (e.g., Fonner & Stache, 2012; Spieler et al., 2017). Regarding teleworkers, Fonner and Roloff (2012) emphasize that there is a connectivity paradox, meaning that connectivity "enables remote work by increasing a sense of presence and connectedness but also negates the benefits of remote work by generating interruptions that may threaten teleworkers' flexibility, focus, and autonomy. Hence, connectivity may simultaneously afford distinct

positive and negative outcomes" (p. 206). In their own study, they indeed find that connectivity increases stress from interruptions and indirectly even diminishes teleworkers' identification. These demands differ from those that an employee faces who is contacted from work during leisure time and should thus not be mingled.

Conversely, it could be also worthwhile to apply research evidence regarding the role of ICT use after hours to the research stream on work design. For example, our studies as well as related research suggests that when examining the usefulness or efficiency of different work arrangements, individual preferences, user habits as well as cultural differences should be considered. In addition, it could be interesting to examine if different communications strategies (e.g., communication via email, instant messaging or video conference tools when at home) are associated to more or less negative effects.

5.2.4 The System Perspective

In Study 2, we considered the organizational level in the form of organizational expectations regarding availability, response times and time sacrifices. Apart from these global and rather static organizational variables, there are other factors from a system perspective that are highly relevant. Communication via ICT during non-work time involves other people, and the behavior, actions and reactions of those counterparts co-determine the employee's experiences and actions. Thus, social processes in the form communication patterns, rhythms or circles should be further explored, for example on the level of work teams. Also the event clusters in our studies do not represent discrete, independent events, but are included in communication circles and highly socially entangled. Similarly, Tyler and Tang (2003) emphasize the importance of studying email rhythms as well as contextual clues for email responsiveness. Those ICT-related interdependencies should be considered when developing models of organizational communication and interactions. Inputs, processes and impacts of communication via email or phone should be analyzed in order to better understand how, for example, a single ICT-related event is socially embedded.

Related to this system perspective, responsiveness signals play an important role. Paczkowski and Kuruzovich (2016) argue that "employees will prioritize their responsiveness to electronic communications based on the signals that they seek to give to their managers and employers" (p. 27), with the motivations ranging from demonstrating proficiency, cultivating relationships, indicating availability, to affective responses to communication activity (see also Gupta, Sharda, & Greve, 2011).

This concept might be an interesting approach to allow for the examination of motivational and decision making processes in technology use. More research is needed on the specific cues and motivational processes why employees work from home in their free time. In this respect, research data gathered in entire work groups could provide further insights into habits and expectations at a group level (see also Park et al., 2011).

Other factors on an organizational as well as national level are important to consider. Previous research suggests that both organizational and legislative support for managing work and family are crucial boundary conditions for an effective and satisfying work-life balance. Those studies investigated the role of different organizational policies and practices, the role of supervisor support and legislative policies on a national level (for an overview, see Allen, Johnson, Kiburz, & Shockley, 2013). Future research should have a closer look on the role of environmental support in the case of ICT use. It is possible that for example a perceived support from one's organization buffers potential negative effects from ICT use, as it implies that when ICT use occurs, it is truly necessary and legitimate. Thus, in future studies organizational expectations as examined in Study 2 could be conceptualized as a counterpart of organizational work-family balance support, with expected effects in opposite directions.

Lastly, it needs to be stated that despite the growing body of research on the effects of ICT use, many of the existing studies either build only on small-scale qualitative data, use small samples or focus on selective professions and industries. Also in this dissertation, our samples are limited in scope or size. Thus, studies based on representative samples are necessary in future research to further validate and expand existing evidence on the role of ICT use for wellbeing and recovery of employees.

5.3 Practical Implications

In this chapter, I provide some overall practical implications for organizations, supervisors and employees in promoting wellbeing and recovery and contributing to the balance between work and private life. A more detailed description of immediate practical implications drawn from our various results can be found in the discussion section of each of the studies in this dissertation.

Overall, our diverse study results suggest that individuals and companies should increase their awareness of opportunities and challenges or dangers that are related to ICT use and to boundary crossing ICT use in particular. Individual (as well as group) habits should be addressed and organizational norms and cultural environments be made transparent. In this respect, supervisors are

on the one hand important actors and multipliers, on the other hand significant role models for their employees.

Beyond raising awareness, it is also important to establish clear team rules, for example regarding availability and response times. However, it is not advisable to enforce strict prohibitions, as this may limit autonomy and lead to a feeling of external control, which has been shown to be detrimental for wellbeing (Ohly & Latour, 2014). Preferably, team specific and individual solutions should be developed. For example, those who feel particularly burdened by intrusions should be encouraged to establish clear time-frames where they do not need to be available – and should not be contacted. This also fosters the sense of self-determined ICT use.

In many organizations, it requires significant change in the organizational culture to reach such awareness and transparency. In order to foster the necessary organizational changes, it seems advisable for future research to put more emphasis on potential interventions for employees, managers, teams and organizations as a whole. Even though many evaluation studies on intervention programs are limited in terms of methodological rigor and lack an assessment of long-term effects, stress management interventions in organizations have generally proven to be effective (Tetrick & Winslow, 2015). It seems advisable to combine individual- and organization-level interventions for better overall results (Lamontagne, Keegel, Louie, Ostry, & Landsbergis, 2007; Michel, O'Shea, & Hoppe, 2015; Tetrick & Winslow, 2015).

Thus, from existent research, factors that help to facilitate a healthy and at the same time effective work-related technology use and work design in general should be extracted. Training programs should be designed that for example deal with healthy and effective technology use within a team and that foster self-reflection on individual user behavior and consequences. On a team level, trainings should allow for reflecting on team behaviors and raising awareness for (implicit) team norms. In international teams, an exchange about potential cultural differences in communication or technology use should be encouraged. As there is no right or wrong way that applies to everyone, trainings should give space for the development of individual or team strategies and for a collective definition of team rules or standards regarding email communication, availability outside working hours or response times.

The need to consider habits besides intentional behavior has important implications for practice as well, because changing habits requires specific interventions (see also Ďuranová & Ohly, 2016). For example, interventions that are closely linked to the person's workplace and that involve an in-depth inspection of one's own routines are more advisable than the transmission of general advices.

While interventions that help to avoid potential detrimental effects of ICT use are crucial, the positive sides of ICT use should not be neglected. In this dissertation, Study 1 in particular showed that employees do appreciate the opportunities ICT use offers, which can for example be inferred from the high prevalence of positive ICT-related events. Thus, it cannot be the goal to forbid or completely undermine work-related ICT use outside of the office, but to help raising awareness for pitfalls and unfavorable side-conditions and to empower employees to decide for themselves (without pressure from norms or expectations) when and how to engage in ICT use. Such autonomy, however, needs self-regulation competences and may be limited in cases of smartphone addiction (see section “Person Perspective”).

Lastly, our research suggests that in international companies, employers should be aware of potential cultural differences regarding the perception and handling of the work-home interface, which also may have an impact on work-related behavior as well as performance and wellbeing. Thus, intercultural sensitivity is an important competence for those who implement HR practices in international companies and organizations.

5.4 Conclusion

Research in the area of work and organizational psychology has to deal with rapid and profound changes in all areas of working life. In these change processes, information and communication technology plays an important and at the same time divers role: it is a means that makes work more efficient and productive and often acts as a catalyzer for new work designs, making work more flexible. At the same time, technological developments put new demands on organizations and their employees. With this dissertation, I aimed at highlighting the chances, but also the pitfalls that technology use implicates for employees. With the help of three studies, the nature and consequences of work-related ICT use as well as influence factors on the individual, organizational and cultural level were investigated. Of course, the results constitute only a small part of the big picture. Thus, I hope to stimulate further research that helps to better understand the complex boundary conditions of ICT use and allows for the deduction of recommendations for a productive but also healthy handling of technological opportunities. Just as much, I would like to encourage a more intensive exchange between research and practice, so that scientific findings are considered in the development of organizational HR policies and work designs.

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Publication Status and Scope of Responsibility

Parts of the research in this dissertation was presented at scientific conferences or published in scientific journals. All of the studies were conducted in close collaboration with research partners. Table 20 provides an overview of the author's responsibilities for each study as well the respective status of publication.

Table 20. Publication Status and Scope of Responsibility

Study	Publication	Scope of responsibility
1	***Journal Paper:*** Braukmann, J., Schmitt, A., Duranova, L. & Ohly, S. (2017). Identifying ICT-related affective events across life domains and examining their unique relationships with employee recovery. *Journal of Business and Psychology*. Advance online publication. ***Conference Contributions:*** Braukmann, J., Schmitt, A., Duranova, L. & Ohly, S. (2015). The Effects of Technology-Related Events on Positive Affect, Detachment from Work and Sleep. *Academy of Management Proceedings*. Vancouver, Canada. Braukmann, J., Schmitt, A., Duranova, L. & Ohly, S. (2015). Is Information and Communication Technology (ICT) a demand or a resource? - Development of an ICT Events Taxonomy. *The 17th congress of the European Association of Work and Organizational Psychology*. Oslo, Norway.	Jointly responsible for conceptual development and data collection, primarily responsible for data analyses and manuscript development.
2	***Conference Contributions:*** Braukmann, J., Schmitt, A., Duranova, L. & Ohly, S. (2015). Wie belastend ist Erreichbarkeit am Feierabend? Der Einfluss des organisationalen Work-Family-Klimas. 9*. Tagung der Fachgruppe Arbeits-, Organisations- und Wirtschaftspsychologie der Deutschen Gesellschaft für Psychologie*. Mainz, Germany. Braukmann, J., Schmitt, A., Duranova, L. & Ohly, S. (2017). Work-related ICT events in the evening and work-home conflict - The role of perceived organizational expectations. *European Congress of Work and Organizational Psychology,* Dublin, Ireland.	Primarily responsible for conceptual development, jointly responsible for data collection, primarily responsible for data analyses, solely responsible for manuscript development.
3	-	Primarily responsible for conceptual development of the study in close cooperation with Chinese research partner, solely responsible for data analyses and manuscript development.

Appendix

Appendix 1: Assessment of Affective ICT Events

The following table displays items to assess affective ICT events from study 1 and 2 that were self-developed for our studies. All other items were original or adapted versions of established scales (see the respective methods session). Items were administered in German. Table A1 shows the German and the English version.

Table A1. Assessment of Affective ICT Events

Study	Items	Answer Scale
1A	**Affective Events** **Negative events** German: Gab es heute [T2]/ am Feierabend [T3] Situationen, die in Zusammenhang mit der Nutzung neuer Technologie (PC, Smartphone, Tablet) standen und die Sie als *negativ bzw. stressig* beurteilt haben? English: Were there any situations today [T2]/after work [T3] which were related to the use of ICT (PC, Smartphone, Tablet) and which you evaluate as being *negative or stressful*? **Positive events** German: Gab es heute [T2]/ am Feierabend [T3] Situationen, die in Zusammenhang mit der Nutzung neuer Technologie (PC, Smartphone, Tablet) standen und die Sie als *positiv bzw. bereichernd* beurteilt haben? English: Were there any situations today [T2]/after work [T3] which were related to the use of ICT (PC, Smartphone, Tablet) and which you evaluate as being *positive or enriching*? **Both valences:** German: Bitte beschreiben Sie diese Situation. Wo haben Sie sich befunden (Ort, Anwesenheit anderer Personen)? Was ging Ihnen durch den Kopf? Was waren Ihre Wahrnehmungen und Gedanken? English: Please describe the situation: where have you been (location, presence of others)? What were your perceptions and thoughts?	Binary (yes/no) Open question format
1B/2	**Affective Events Checklist** **Negative Events** *Continuing Work Tasks (NEG):* German: Ich musste heute am Feierabend berufliche Aufgaben abarbeiten (z.B. Nachbereitung/ Vorbereitung, E-Mailablage etc.). English: Today, I had to finish off work tasks during private time (i.e., postprocessing/preparation of work day). *Work Emails at Home:* German: Ich wurde heute am Feierabend durch berufliche Anrufe gestört oder fühlte mich durch anstehende Telefonate belastet. English: Today, I was disturbed by incoming work calls during non-work time or stressed by expected calls.	Binary (occurred or not occurred) and Likert Scale[11] (not stressful to very stressful)

[11] The Likert Scale items were not used in this study, but are reported here for the sake of comprehensibility.

Study	Items	Answer Scale
	Work Calls at Home: German: Ich wurde heute am Feierabend durch (akute) berufliche E-Mails gestört oder fühlte mich durch erwartete Nachrichten belastet. English: Today after work I was disturbed by (urgent) work emails or felt stressed by expected messages.	
	Positive Events *Continuing Work Tasks (POS)* German: Ich konnte heute von zu Hause bzw. außerhalb der Arbeitszeit Aufgaben abarbeiten. English: Today, I was able to continue or finish tasks from home/ outside of working hours	Binary (occurred or not occurred) and Likert Scale (not enriching to very enriching)
	Availability at Home German: Ich war heute während des Feierabends für Berufliches erreichbar (Anrufe, E-Mails) bzw. konnte andere erreichen. English: Today, I was available via ICT for urgent work matters during private time (calls, emails)"	

Appendix 2: Study 1A Qualitative Data

The following tables display all statements of the participants regarding positive and negative ICT events that were included in our event taxonomy. The statements are provided in German as the original language.

Negative ICT Events

Table A2. Qualitative Statements Study 1A: Negative ICT Events, Sorted by Event Cluster

Negative ICT Events Reported in study 1A
N1 Disruption Meeting
Ablenkung während eines Termins
Anrufe während Termine, Erinnerungen aus Kalender, SMS, whats app
Anrufe während einer Konferenz
Auf der Arbeit und dann klingelte das Smartphone mitten in der Therapiestunde.
Dienstreise und ständiges klingeln. Kaum Zeit für den eigentlichen Sinn der Dienstreise.
Dringende Anfragen per mail (Smartphone) während einer Besprechung. Schwierigkeiten mich auf das Gespräch zu fokussieren nachdem ich den Betreff auf dem Smartphone gelesen habe.
Dringendes Telefonat bzw. email-Beantwortung während eines Meetings. Streß, Unhöflichkeit gegenüber den anderen Meetingteilnehmern.
E Mails auf dem Smartphone während eines Meetings , Social Media Pop Up während eines Meetings
Erneute und ständige Projektupdates vom Kunden, die 3 Tage zu spät an uns gerichtet wurden - erhalten in Meetings und auch in der Pause. Gedanke: Warum melden sie sich jetzt erst und warum sollen wir wieder Fehler anderer Agenturen ausbügeln?
Ich war in einer Telefonkonferenz mit dem Auftraggeber als mein Handy klingelte und ebenfalls ein wichtiger Auftraggeber anrief. Ich erhielt direkt eine eMail mit der Bitte um Rückruf, war jedoch noch für weitere 2 Stunden gebunden und musste dies dazwischen schieben. Dies ist zwar eigentlich eine alltägliche Situation, nur wusste ich, dass es diesmal zeitkritisch war.
Im Mitarbeitermeeting ist eine Mail Eskalation per Mail eingegangen. Nach dem Lesen der Mail war man mental bereits bei der Klärung des Vorgangs und es war keine Konzentration auf das aktuelle Meeting mehr möglich. Verbunden war das mit einem beklemmenden Gefühl und Stress.
In einer Telefonkonferenz wurde ich gleichzeitig von 2 Personen angechattet, die dringend eine Auskunft benötigten und eine Fehlermeldung die per Smartphone gemeldet wurde und um zeitnahe Behebung der Störung gebeten wurde. Man kann sich auf die Konferenzthemen nicht konzentrieren und verpasst ggf. wichtige Infos oder das man etwas gefragt wird. Gleichzeitig erzeugt es einen Stresspegel und last Hektik entstehen, da man versucht ist, alle Themen gleichzeitig und gleichwertig zu behandeln.
In mehreren Terminen. Erinnerungen zu Folgeterminen via Smartphone (Geräusch). Habe den Ton ausgestellt. Bei Anrufen auf Unterdrücken gestellt. Nach den Terminen den vollen Posteingang im Email Account gesehen.
Mein Handy hat geklingelt während ich über mein Laptop in einer Telefonkonferenz war. Obwohl ich den Anrufer weggedrückt habe, hat es der Anrufer noch 2 weitere Male versucht und mich abgelenkt. Ich war leicht genervt und sauer.
Ort: Büro Situation: Gespräch mit einem Mitarbeiter. Während des Gesprächs rufen drei unterschiedliche Personen an. Was ging mir durch den Kopf?: Ist es dringend? Wer ruft an (Chef bzw. wichtige Personen)? Muss ich mein Gespräch unterbrechen?
Ständiges Klingeln des Smartphones während eines Meetings, da ich vergessen hatte es auszuschalten. Ich war in meinem Büro, andere Kollegen waren für ein internes Meeting anwesend. Meine Gedanken: Nicht wertschätzend gegenüber den Kollegen, die ic
Voice over IP Telefonate die immer aufploppen während ich am normalen Telefon war
Während einer Diskussion in einer Telefonkonferenz, die nicht so einfach unterbrochen werden konnte, meldete sich mehrfach die Erinnerung an den nächsten Termin mit hoher Wichtigkeit. Dabei verliert man die Konzentration auf die aktuelle Diskussion und befürchtet den Anschlusstermin zu rechtzeitig zu schaffen, bzw. das aktuelle Thema nicht vollständig bearbeiten zu können.
Während Telefonkonferenz Chatanfragen

N2 Disruption Workflow
Anrufe auf dem Smartphone haben mich heute immer wieder aus anderen Themen herausgerissen und meinen Arbeitsfluss im Büro gestört.
Das während der Arbeit ständig das Telefon läutete
Eingehender unerwarteter Anruf vom Kunden auf dem Smartphone, anstelle des Bürotelefons. Daraus konnte ich bereits schließen, dass es sich wohl um eine dringende Angelegenheit handeln musste. Ich war verärgert über die unerwartete Unterbrechung.
kurzfristige Nachrichten die einen geplanten Tagesablauf nicht mehr zugelassen haben
Mailfach läuft bei kurzer Abwesenheit ständig voll, kein konzentriertes und kontinuierliches Arbeiten an Projekten möglich, ständige Unterbrechungen. Smartphone mit Kurznachrichten/privaten Mails verschärft Situation noch (Ton ausgestellt)
Sehr viele Mails und Kundenanfragen, kein eindeutiges Kundenfeedback, widersprüchliche Kundenaussagen, viele Telefonate. Kommt dies alles zusammen, ist es schwer, fokussiert zu bleiben. Der Hinweis, einfach Mails oder das Telefon zu ignorieren, funktioniert leider nicht immer.
ständige Unterbrechungen durch Anrufe.
Unwichtige Nachrichten die mich abgelenkt haben
Während ich gearbeitet habe, hat mich ein Kollege per Lync (Instant Messaging) kontaktiert, um sich 5 Min auszutauschen, was dann knapp 30 Min gedauert hat, obwohl ich sehr viel zu tun hatte.
Wechsel ins Home-Office um konzertiert eine Aufgabe fertig stellen zu können. Während der Bearbeitung dennoch Unterbrechungen durch Emails, priv. Korrespondenz. Es dauert länger als gedacht. Auch weil der Aufwand unterschätzt wurde.
N3 Communication Overload
Am Arbeitstisch, zu wenig Zeit für all die Arbeit
Arbeit an Präsentation mit zahlreichen Details erforderte höchste Konzentration. Folge: Verspannungen, angestrengte Augen (aber auch Zufriedenheit mit Ergebnis)
Auf der Rückfahrt meiner Dienstreise hat mein Handy mehrfach geklingelt. Zudem zeigte mir die Erinnerungsfunktion ständig offene To-Dos an und erinnerte mich daran was ich alles noch nicht erledigt hatte obwohl der Arbeitstag eigentlich schon auf das Ende zuging.
Gegen 9 Uhr ist eine Anforderung vom Auftraggeber per Mail eingegangen. Die Anforderung bestand in der Erstellung von Abarbeitungsplänen und Maßnahmenplänen die aufzeigen sollen wie wir alle Kennzahlen bis Monatsende in Ziel bringen. Deadline für die Abgabe der Pläne war bis 12. Die Pläne sind um 11:59 Uhr rausgegangen, um 12:01 Uhr haben wir eine Mail erhalten wo die angeforderten Pläne bleiben. Dieser Vorgang erzeugt Druck, da man die Arbeit, die man sich vorgenommen hat liegen lassen muss bzw. in einer kürzeren Zeit schaffen muss als geplant. Außerdem ärgert man sich auch, dass man bereits 1 Minute nach der Deadline nach dem Verbleib der Informationen gefragt wird und das Ganze auf einem E-Mail Verteiler.
Im Großraum Büro. Viele Emails und andere Aufgaben am PC sowie Häufiges Telefonklingeln meiner Kollegen und Telefonate
Kurz vor einer wichtigen Präsentation kamen auf einen Schlag 30 Mails auf dem Blackberry an, eine Art interner Shitstorm zu einem kritischen Thema, das eskalierte, weil ich mich nicht sofort eingeschaltet hatte... Es ärgert mich, dass erwartet wird, dass man während der Arbeitszeit an seinen Mails festgewachsen sein muss.
Laptop im Büro: E-Mails, E-Mails, E-Mails - den ganzen Tag über und es wollte einfach nicht aufhören. Irgendwann habe ich das E-Mail-Programm mal für einen Moment abgeschaltet, ansonsten wäre ich wohl zu nichts gekommen.
PC, viele Mails
Permanenter E-Mail-Eingang, der mir die Abarbeitung von Themen erschwert sowie gleichzeitige Anrufe auf dem Smartphone... Backlog an Themen nimmt kontinuierlich zu, durch Mail- und Telefonerreichbarkeit kann man sich dem aber nicht so einfach entziehe
So viele Emails, Anfragen via Lync
Today I received my new Tablet PC, hence I needed to exchange all the settings data etc to the new system. This together with the normal email volume meant twice as much work. I felt as though I was not able to carry out my job fully however still trie
Wenn zusätzlich zum normalen Telefon das Smartphone Nachrichten schickt, die schnell beantwortet werden müssen, ist das kaum möglich. Heute sind mehr Informationen angekommen über das Smartphone als über den normalen beruflichen Weg

Wir haben am pc etwas für unsere Schulabgänger bearbeitet. Da die Kinder mitentscheiden durften....jedes Kind hatte etwas anderes auszusetzen. Später waren alle glücklich und zufrieden:-)
Zu viele Emails zu verschiedenen Themen, von denen viele eine hohe Priorität haben
Zu viele Mails in zu kurzer Zeit auch in Meetings
zu viele verschiedene Baustellen und gleichzeitig zu viele Termine, die bei einer Teilzeitstelle wie meiner schon schnell einen halben Arbeitstag ausfüllen können
Zu viele verschiedene Baustellen, zu viele Emails, langwierige Vorbereitung einer Webkonferenz mit technischen Schwierigkeiten
N4 Technical Problems
1. Im Zug zum Arbeitsort Laptop gerade ausgepackt und Unterlagen hervorgeholt, da musste der freie Nebenplatz wieder geräumt werden. 2. Smartphone während der Arbeitszeit war stumm gestellt, erwartete Nachricht daher verpasst und zu spät gesehen 3. Niedriger Batteriestand Smartphone vor Rückfahrt > Empfang wird knapp 4. Schlechte Internetverbindung im Zug
11:30 Uhr: Durch SPAM-Filter verlorengegangene Email entdeckt, restauriert aber dennoch während des Restore-Prozesses im Datenhimmel gelandet. Den Inhalt konnte ich nur im reinen Textformat zur Kenntnis nehmen. Zwei Minuten später erschien der Schüler (Kunde) und erkundigte sich diesbezüglich. Es ging um einen Sachverhalt, der der als Aufgabe schriftlich seit 3 Wochen vorlag und besprochen wurde. Allen war die anstehende Aufgabe klar. Die rhetorische Fragestellung bezog sich auf das Versäumnis des Schülers rechtzeitig begonnen zu haben und nun nicht mehr genügend Zeit zu haben, die Mindestanforderungen bis zum Abgabetermin zu erfüllen. Die Augenblicksentscheidung über Entgegenkommen, Beharren auf der lange bekannten Position oder einen Mittelweg zu finden bedeutet im Zusammenhang mit weitern terminlichen und unerwarteten Zusatzaufgaben eine Verdichtung von Entscheidungsprozessen die parallel zur Arbeit am PC in angemessener Form verbal artikuliert werden müssen. Eigene Argumentationen sind im Dissens nur dann Energie sparend anzubringen, wenn sie beim ersten Versuch vom Gegenüber verstanden werden und der Gesamtsituation entsprechend als angemessen akzeptiert werden können. Kurzfristig ist also volle Konzentration erforderlich. Ich hatte mich dann für den grauen Weg entschieden. Das Abgegebene bringt anteilige Ergebnisse, die dann sehr wahrscheinlich nicht mehr einem Maximalergebnis entsprechen werden. Daraus ließ sich für den Kandidaten schließen nicht unbedingt schlechter als ausreichend beurteilt zu werden, was seine bisherigen Befürchtungen entkräftete. Haken dran. Weitere organisatorische Aufgaben der Klärung von Sachverhalten und Umständen erweiterten den vorgeplanten Ablauf. Termine verschoben sich geringfügig, was aber folgenlos blieb. Arbeitsplatz im Büro (Dreier-Büro), ein Kollege anwesend zwei weitere Schüler mit anderen Anliegen wartend. Der Kandidat hätte die Frage nicht stellen müssen. Die Situation blieb ruhig und sachlich, was ein Hauptanliegen von mir ist. Vorgang abgeschlossen wie erwartet. Restzeit für Folgetermin nicht außer Acht lassen - wichtiges und dringendes zuerst: ABC eben. (Hinweis: Seit einer abendlichen Radiosendung vom Deutschlandfunk (den kann ich auch heute noch sehr empfehlen) im Jahr 1984 befindet sich in meinem Kopf ein kleines Männchen, das mir immer wieder sagt freundlich, sachlich und ruhig zu bleiben. Es ging damals um Autosuggestion und die nachhaltig positive Beeinflussung der eigenen Stimmung und des Selbstvertrauens durch wiederholtes (4-5 mal) breites für ca. 2 minütig gehaltenes Grinsen bis zu den Ohren. Zwischendurch kurze Entspannung der Gesichtsmuskeln. Nach drei Tagen hatte ich nie wieder schwermütige Gedanken oder Sorge vor Misserfolg (vor dem NLP-Hype Ende der 80er). Viele Jahre späterer Erfahrung bei Feuerwehr und DLRG mit Einsätzen für Sach- und Menschenrettung mit Glück und Pech prägen die Konzentration auf Übersicht und Zielsetzung ebenfalls.)
Arbeitsergebnisse von einzelnen Schülern konnten nicht gespeichert werden, da sie den Hinweis auf Registrierung nicht gelesen und weggeklickt hatten. Dass dieser Hinweis erschien war für mich unerwartet und neu. Eine Umstellung in der zentralen DV-Steuerung hatte diese Aufforderung zur Folge. Einige Schüler hatten den Vorgang korrekt umgesetzt ohne Bescheid zu geben. Andere Schüler hatten den Dialog einfach weggeklickt. Eine vorherige Kommunikation als Ankündigung über diese Umstellung seitens unserer DV hätte den Verlust von Schülerergebnissen verhindern können. Das Änderungsmanagement mit transparenter allseits verfügbarer Information wäre oftmals wünschenswert. Die technischen Mittel wären dafür auf jeden Fall vorhanden. Investiert, aber nicht zu Ende gedacht. Ort Laborraum mit Einzelschüler-PC in Frontal- (Sprachlaborausrüstung). Die gesamte Klasse war anwesend und in Fertigstellung ihrer Kleingruppenergebnisse vertieft. Schräge Kommentare gab es nicht, aber auch kein Mitleid Jeder hatte intensiv zu tun. Gedanken: Ich habe mich damit abgefunden, dass die Informationspolitik teilweise ein Hoheitsinstrument ist und man als immer wieder betroffener hinter den neuen Entwicklungen und vor allem zunehmenden Einschränkungen hinterherlaufen muss und nur selten Arbeit behindernde Maßnahmen nicht rückgängig machen kann. Das ergibt keinen Frust, aber Resignation über die eigene Machtlosigkeit. Die

Abhängigkeit von einer insebsondere gut funktionierenden DV wir mir immer deutlicher, je mehr ich darüber nachdenke. Die Empfehlung eines Workarounds konnte dann den Totalverlust vermeiden. Wir haben die Ergebnisse ausgedruckt, die nicht zu speichern waren und dann eingescannt, um sie verfügbar zu halten.
Auf Arbeit, allein, wütend weil ein Programm abgestürzt ist
aufgrund interner Sicherheitsrichtlinien konnte ich an einer online-Schulung nicht teilnehmen und musste mich erst über die IT freischalten lassen. Lästig und unnötig, da diese Schulung allgemein bekannt im Unternehmen war und ich von mehreren hörte,
Ausfall der Telefonanlage und ausbleibende Erreichbarkeit im Büro
Das Internet funktionierte nicht! Ich könnte mich nicht mit dem Server meines Arbeitgebers verbinden und war nicht arbeitsfähig
Der PC war furchtbar langsam, das hat mich Zeit gekostet. Ich war heute extrem unter Zeitdruck und hatte dafür keine Nerven.
Download einer wichtigen großen Komponente, die ich dringend zum Weiterkommen brauche, hat ewig gedauert/war sehr langsam und ist immer wieder abgebrochen.
Druckerprobleme, Hardwareinstallationen
Durch diverse Updates war das Laptop zeitweise kaum nutzbar, das ist nicht besonders hilfreich, wenn man diverse Emails schreiben muss...
Einchecken via online App
Heute lag der kleine Stressfaktor nur an der Internet Verbindung
Heute streikt mein Outlook und verlangt ständig von mir dass ich ein Passwort eintrage. Das ist nervig und ärgerlich.
Ich war an einem fremden Standort - Workshop mit bisher unbekannten Kollegen und der Internetzugriff wollte nicht funktionieren. Es hat über eine Stunde gedauert, bis ich online war und somit Zugriff auf benötigte Informationen bekam.
Im Büro konnte ich auf Grund eigener Unwissenheit meinen pc nicht bedienen und das vor Kollegen und externen Geschäftspartnern.
Im Büro mit Kollegin Es war etwas nervig, dass ich eine größere Datenmenge drei Mal umspeichern musste, damit ich sie bearbeiten konnte.
In Kassel an der Arbeit habe ich am ich gearbeitet und die Verbindung im Netz war sehr langsam
Internetverbindung ging nicht, fühlte mich vom Lauf der Welt abgeschnitten (wenn auch nur für wenige Minuten). Software-Problem: Film sollte komprimiert werden, um wenig Speicherplatz beim Hochladen auf eine Plattform mit beschränkter Kapazität zu
i-phone funktioniert nicht wie gewünscht, statt der vielgepriesenen intuitiven Bedienung müsste ich die IT um Support bitten, die mühsam ausprobieren mussten, wie es geht (Ziel: Anzeige von E-Mails im Sperrbildschirm). Jetzt klappt's ... PC: Unzufriedenheit mit Spamfilter
Mein Laptop hat heute für 2h nicht funktioniert und die IT hat lange benötigt, das Problem in den Griff zu bekommen.
Mein outlook funktionierte heute nicht und das office Paket musste zweimal installiert, bevor das Problem behoben werden konnte.
Mein PC hat heute geflackert, so dass das Arbeiten unter erschwerten Bedingungen möglich war.
Mein Programm Lync geht seit Tagen nicht richtig und somit kann ich nicht alle Kollegen intern kontaktieren. Daher habe ich mich aufgeregt. Es waren ein IT-Kollege anwesend, und mein Chef. ich wurde laut, denn mein Chef hat dann dem IT-Kollegen erklärt warum wir Probleme haben und dass es noch keine Lösung in Sicht gibt.
Ort: Büro; die Internetverbindung wurde immer wieder unterbrochen, die Anmeldemaske ist immer wieder aufgeploppt; nach dem 10. Aufploppen war ich verärgert, dass ich ständig meine Anmeldedaten eingeben muss und dennoch keine Verbindung aufgebaut wird.
Pc reagierte sehr langsam und hinderte meinen Ablauf
PC Serverausfälle am Vormittag, ständige Arbeitsunterbrechungen am Schreibtisch es ist nervig - dadurch das viele Arbeiten nur mit Hilfe von Daten die in der EDV gespeichert sind erledigt werden können, kommt man in so einer Situation keinen Schritt weiter die Zeit könnte ich sinnvoller nutzen - da nicht absehbar ist wie lange solche Störung dauert habe ich meinen Arbeitsplatz nicht verlassen - obwohl es sicher sinnvoller wäre
Präsentation von Studenten hat nur bedingt funktioniert, es gab technische Schwierigkeiten. Das hat Geduld erfordert. Außerdem nervten mich lange Ladezeiten am Smartphone aufgrund schwacher Konnektivität.
Programmierprobleme, bugfixing

Schlechte Synchronisation Laptop im Wlan/ Netzwerkverbindungen während Besprechung / Workshop
Schnittstelle zum Server hatte Schwierigkeiten, daher nur langsames arbeiten möglich
Softwareentwicklungsproblem, habe mit einem Kollegen weitere Entwicklung eines Programms besprochen. Stimmung war nicht so toll, es herrscht ein Gefühl der Stagnation im Projekt
System war falsch angelegt
Telefonanlage defekt, keine Erreichbarkeit von extern
Updates, die mehrmaliges hoch- und runterfahren des PCs nötig gemacht haben, Fehler nach dem Einspielen der Updates (kein Internetzugriff), keine Möglichkeit, den Zeitpunkt des Updates zu steuern (systemseitig vorgegeben, man muss innerhalb von 30 Minuten alle Arbeitsvorgänge abbrechen, sonst wird das Update automatisch gestartet.)
Vorlesung gehalten, Adapter für Beamer an Laptop hat gefehlt. Dann hat der Laptop regelmäßig das Display abgeschaltet. Das war beides sehr ärgerlich.
Wegen zeitweisen Ausfalls von Outlook im Unternehmen konnte ich einen bereits vorgelegten versionsstand eines Berichtes nicht aufrufen, um redaktionelle Änderungen einzuarbeiten. hätte ich die Datei klarer bezeichnet ...
Wieder mal heute habe ich Lync Probleme gehabt, und kann weder telefonieren, noch angerufen werden. Ich habe mich bei meinem Chef beklagt, der es wieder umgehend der IT Abteilung eskaliert hat. Anscheinend soll das Problem dann morgen behoben sein...
Zugausfälle, keine Taxis, Apps und Kommunikation teilweise stark zeitverzögert
Programmierproblem, das sich hartnäckig hält
N5 Multi-Channel-Use
Die Nutzung durch Microsoft lync erzeugt Stress durch die gleichzeitige Verfügbarkeit auf mehreren Kommunikationskanälen bei gleichzeitiger Nutzung von Smartphones und Outlook.
die Nutzung von Lync wodurch verschiedene Kommunikationskanäle gleichzeitig vorhanden sind und genutzt werden.
Dienstreise, Erstellen einer Präsentation über Mobilfunknetzwerk, während einer Telko mit diversen Personen und unterschiedlichen Auffassungen. Genervt. Wunsch den Telkoraum zu verlassen.
Du bist in einer Telco am Festnetz, das Handy klingelt permanent, die drei Leute, die dich erreichen wollen, schreiben dir in diesen 45 Min. je drei Mails, denen du antwortest, dass du in einer Telco bist, worauf sie nochmal schreiben, dass du zurückrufen sollst. Haben Sie mal gezählt, wieviele Mails das sind?
E-Mails am Arbeitsplatz im Minutentakt empfangen; während Telefonaten im Festnetz parallel Anrufe auf Handy erhalten;
Es gibt nicht diese eine Situation. Es passiert ständig. Ich telefoniere am Festnetz, das Handy klingelt. Ich bin am Handy, vor der Tür stehen zig Menschen, die E-Mails überschlagen sich mit Urgent und Ausrufezeichen, das Festnetz bimmelt... Ich denke ständig, dass ich mich nicht zerteilen und nicht an zwei Orten gleichzeitig sein kann.
Gleichzeitig die Nutzung mehrerer Medien - fehlende Priorisierung der Aufgaben
mehrere Themen von unterschiedlichen Absendern über die Kanäle Smartphone, PC und Telefon kamen kurz vorm Mittag auf einmal
Parallele Beantwortung von Telefon, Smartphone und Laptop
Smartphone, Laptop IPad
verschiedene gleichzeitige Kommunikationskanäle die verwendet werden und dadurch Stress erzeugen
N6 Private Disturbances
Ich erhielt mehrere SMS von einem Freund, der in Schwierigkeiten steckt, da es dringend war, musste ich sofort zurückschreiben und konnte meiner Arbeit nicht nachgehen.
Mittagspause: Private Nachricht auf dem Smartphone via WhatsApp. Ich war allein im Büro, als ich die Nachricht las. Mir gingen einige negative Gedanken durch den Kopf, was sich die Person wohl dabei gedacht hat, als sie mir diese Nachricht geschrieben hat. Sie schrieb die Nachricht nicht in böser Absicht, aber sehr unsensibel und ich vermute dass sie in einem Punkt nicht ehrlich zu mir war. Dies hat mich enorm beschäftigt, ich habe in der Pause nur darüber nachgedacht, meine Gefühle waren eine Mischung aus Ärger, Wut, Enttäuschung, Angst, Apathie. Sehr viel Negatives eben. Nicht nur die Pause war gelaufen, auch danach konnte ich mich nicht mehr konzentrieren und wollte nur, dass der Arbeitstag endlich rumgeht.
Viele private Nachrichten und auf Arbeit keine Zeit zu antworten.

Während des Arbeitens, Home Office, viele Nachrichten (privat) erhalten, die haben mich vom Arbeiten abgelenkt. Ich war alleine zu Hause. Nachdem ich viele Nachrichten empfangen hatte, habe ich das Smartphone lautlos gestellt.
N7 Being On-Call While Absent
Abwesenheitsnotiz nicht eingestellt, so dass Termine nicht organisiert, wahrgenommen werden konnten
Chef rief mitten in einem wichtigen Meeting an. Musste rangehen, da er ja weiß, dass ich das Handy immer am Mann habe.
Ich war in einem Meeting. Da die Abteilung dünn besetzt war, habe ich ständig auf mein iPhone geschaut. Leider war der Empfang schlecht. Das hat mich sehr gestresst.
In einem Termin(Audit) erstand eine kurze Leerlaufphase (meine persönliche Wahrnehmung), ich fühlte mich genötigt auf das Smartphone zu schauen, ob etwas von Relevanz eingegangen war und fand prompt eine E-Mail deren Inhalt mir wichtiger erschien als der aktuelle Termin, weshalb ich mich herausstahl und dem Anliegen im persönlichen Dialog mit dem Absender nachging.
Während eines Ganztagsseminars habe ich immer in den Pausen meine Mails gecheckt. Dadurch wurde ich zwischenzeitig nervös und besorgt, dass etwas in meiner Abwesenheit nicht klappen könnte.
N8 Disturbance on the Way
Arbeit in anderem Büro und im Zug
Ich befand mich auf der Autobahn als eine wichtige Nachricht ankam , die mich belastete
Ich war im Mietwagen mit einem Kollegen vom Flughafen zur Arbeitsstätte unterwegs und das Handy klingelte mehrfach, ohne dass ich die Anrufe entgegen nehmen konnte. Mir ging die Frage durch den Kopf, ob ich jetzt etwas Wichtiges verpasse, wobei mir bewusst ist, dass das übertrieben ist, so zu denken. Ich konnte diesen Gedanken jeweils schnell abstellen. Bei Ankunft am Zielort musste ich aber sofort prüfen, wer angerufen hat.
Intensives und wichtiges Telefonat mit dem Auftraggeber aus dem Auto heraus. Hohe Konzentration auf die Gespräche und wenig Aufmerksamkeit für den Verkehr.
Kalender Einsicht während der Autofahrt
Mails während der Autofahrt
Terminabstimmungen Outlook, Termincheck mit Smartphone von unterwegs
Ich muss immer lachen, wenn die Frage kommt, wie ich mich an diesem Nachmittag fühle, wenn mein Arbeitstag leider um 23.45 Uhr noch immer nicht zu Ende ich. Heute wurde ich in der Mittagspause zweimal angerufen, beim Essen holen. Das gehört zum Standard, es gibt absolut keine Ruhezeiten mehr.
Mehrfachstörung in der Mittagspause, sowohl auf dem Weg zum Brötchen, als auch bei dessen Verzehr...
im Auto allein, aus Neugier aufs Smartphone geschaut, Mail gelesen während der Fahrt, Gedanken an mgl. Unfall
Maileingang während der Autofahrt
Auf Dienstreise, beim Abendessen mit einem Kollegen, der Vibrationsalarm signalisierte den Eingang einer E-Mail die ich unweigerlich studierte
N9 Continuing Tasks
Aufarbeitung einer Präsentation für morgen. Ich saß im Shuttle Service vom Flughafen zum Hotel mit zwei Kollegen und wir haben gemeinsam die Präsentation überarbeitet. Ich empfand es als negativ, weil ich mein Anteil bereits am Freitag eingereicht hatte und meine Kollegen die Aufgabe ständig verschoben haben und wir somit heute Abend noch ca. 1 Stunde arbeiten müssen, was vermeidbar gewesen wäre.
Aufarbeitung von Aufgaben für einen wichtigen Termin am Folgetag, die ich vor Feierabend nicht geschafft habe. Gedanken: Es hat mich geärgert (wieder mal) meinen Feierabend dafür zu opfern, es hätte mich sonst aber auch nicht losgelassen.
Aufgaben für die Arbeit
Durch Dienstreisezeit im Auto (4 Stunden) habe ich Zeit zur Bearbeitung meiner Aufgaben verloren und dann erst nach Feierabend am Smartphone eMails bearbeitet. Gedanken: ich hatte keine Lust dazu, musste mich aber auf den aktuellen Stand bringen
Eine E-Mail vom Nachmittag ging mir nicht aus dem Kopf und ich wollte sie unbedingt kommentieren.
E-Mail-Aufarbeitung über den Laptop in den Abendstunden. Dabei viel Ärger über adressierte Themen.
Fertigstellung bereits begonnener umfangreicher arbeiten
gerade jetzt den Fragebogen am Smartphone ausfüllen
Habe abends noch am PC gearbeitet
Ich bin um 23 Uhr von einer Eigentümerversammlung zurückgekehrt und es stresst mich, jetzt noch den Fragebogen zu beantworten.

Ich habe nur ja angekreuzt, weil ich dokumentieren wollte, dass ich direkt vom Arbeiten ins Bett gehe...
Ich habe von Zuhause noch viele offene To-Dos bearbeiten müssen. Gedanken: Wenn ich es jetzt nicht mache, schaffe ich morgen vor dem Wochenende die wichtigen Themen nicht mehr.
Ich musste einfach weiter- und weiterarbeiten...
Im Garten. Ich habe versucht Informationen zu einer Flugreise zusammenzustellen. Das hat aber aus verschiedenen Gründen nicht funktioniert. Beim Buchen der Bahnfahrkarten ging auch nicht alles glatt. Ich fühlte mich vom heißen Tag ausgelaugt und war diesem Stressor nicht gewachsen.
Im Hotelzimmer auf Dienstreise. Genervt, dass ich noch am Abend eine Präsentation anschauen musste. Gedanken waren, Angst und Bammel vor der Präsentation
Laptop (zum Arbeiten nach Hause mitgenommen) kann über VPN nur langsam auf Laufwerk zugreifen. Laden und Speichern mit Unsicherheit (Absturz?) und Zeitaufwand verbunden.
mail Bearbeitung nach Feierabend
nach Ankunft im Hotel wurden Mails bearbeitet
Nachbearbeitung offen gebliebener, aber dringender Themen des Arbeitstages am Laptop (Zuhause im Büro), Gedanken an nicht erledigte Aktivitäten trotz ca. 10 Stunden Arbeitszeit in der Firma
Nachbereitung des Arbeitstages in der fußballkneipe, Handy als hotspot fürs Notebook. email Ablage
Ort: zuhause am PC, Anwesenheit: mein Mann, Situation: Vorbereitung eines Gesprächs mit dem Vorgesetzten
Token ermöglichte keinen Zugriff auf den Betriebsrechner von zuhause aus. Erst nach mehreren Versuchen erfolgreich, Besuch war anwesend. Ärger. Unerklärlich warum es nicht funktionierte.
Vorbereitung eines Kundenmeetings in Berlin zu Hause
Während der Massage offene Punkte geklärt da es zeitlich nur dann ging. Ich war nicht auf mich konzentriert.
N10 Work Calls at Home
Annahme von Telefonaten während der Freizeit / während der Abholung des Kindes bei der Schule. Zwischendurch Rückruf, als Kind mit Nachbarkind spielte.
Ich habe Abendbrot gemacht, das Handy klingelt. Ich über mir meinen Kindern Mathe, das Handy klingelt...
Ich mit meinen Kindern beim Arzt zur FSME-Impfung, das Handy klingelt, ich drücke das Gespräch weg auf die Mailbox und schalte auf lautlos. Als wir nach 12 Minuten aus der Praxis kommen, habe ich 6 Anrufe in Abwesenheit von der gleichen Person, die ein
Während des Feierabendeinkaufs Anruf von befreundetem Kollegen, der kein Ende finden konnte. Ich dachte, hätte ich den Anruf doch nicht angenommen. Aber aus Langeweile ruft der nie an. Hätte etwas wichtiges sein können.
Zu Hause, letzter Urlaubstag und erster Werktag wieder im deutschen Netz: ein Kollege rief an - und störte eine kreative Stunde mit meiner Tochter. Ich bin nicht ran gegangen, morgen muss auch reichen, gleichzeitig aber könnte ja irgendein größeres Problem anstehen...
Anruf nach Feierabend während ich einkaufen war.
Anrufe lang nach Feierabend
Anrufe und Emails am Abend
beim gemeinsamen TV-sehen einen Handy-Anruf, den mein Partner entgegen genommen hat und beruflich am Abend telefoniert hat, dabei den Ton vom TV abgeschaltet und der Film war dadurch für mich unterbrochen - Faden verloren - genervt
Ich war Zuhause. Wurde von einem Lkw Fahrer angerufen der noch eine Frage hatte.
Kollegen geholfen, der vor meinem freien Tag noch Fragen hatte.
Spielplatz, in Anwesenheit meiner Kinder: Anruf eines Kollegen wg. Korrektur-Frage, meine Wahrnehmung danach: "Hoffentlich geht alles gut!" -> weniger Aufmerksamkeit für die Bedürfnisse der Kinder
Telefonieren in der Freizeit
Unterbrechung Konzentration durch ständige Anrufe...
wenn man mit Freunden weg geht, ist viel das Handy im Einsatz, man ist immer erreichbar
Erneuter Anrufversuch eines Kollegen, während des Abendessens trotz letztem Urlaubstag
Fühlte mich verpflichtet, zur WM-Halbzeitpause eine Kollegin anzurufen, um den Fortgang der Erstellung einer Präsentation zu besprechen.
N11 Work Emails at Home
Erreichbarkeit per Mail auf dem Smartphone, trotz vereinbarter Abwesenheit der Druck Mails zu checken
Habe heute Urlaub und da habe ich einige Mails gesehen, die mich dazu gebracht haben dennoch zu arbeiten.

Ich habe frei und habe dennoch Mails bekomme auf die heute eine Antwort erwartet wurde
Mails für Arbeit schreiben und checken obwohl heute krankgeschrieben
Am Abend habe ich gesehen, dass ich eine Mail bekommen habe. Diese habe ich gelesen. Das Thema hätte heute geklärt werden können und müssen. Nun kann ich erst am Donnerstag klären und das ärgert mich jetzt
Anfrage per email einer Kollegin, die eine Rückmeldung nicht verstanden hat, bei einem Thema, das schon längst geklärt war
Arbeitsemails...
aufgrund privater Termine nach Dienstreiseende keine Tätigkeit nach Feierabend außer kurzer Mailcheck auf dem Smartphone
Befand mich in einer Pizzeria. Wurde per SMS von einer Mitarbeiterin(die noch am arbeiten war) um Rat gefragt. Problem in der Firma.
Das ständige bingen beim Maileingang!
Diverse Emails mitbekommen, die die Probleme von Morgen erahnen lassen! Düse versuche ich jetzt bereits zu durchdenken!
Emails bearbeiten
E-Mails checken um 22 Uhr
Habe aus Neugier Mails gelesen und mich über den Autor und Kollegen sehr geärgert. Hätte auch bis morgen Zeit gehabt...
Habe Mails beantwortet
Ich habe zuhause noch E-Mails gelesen und mich eigentlich über mich selbst geärgert, dass ich das gemacht habe, weil ich dann nicht nur gelesen habe, sondern auch unmittelbar geantwortet habe
Ich schicke meine Kinder zu Bett, weil ich noch arbeiten muss. Seit 18 Uhr habe ich bereits 34 Mails angesammelt, davon 6 mit Kennung Urgent ...
Kann Mails nicht abrufen, da iPhone nicht lädt. Bekomme also nur die ersten 2 Zeilen. Unangenehmes Gefühl, würde sie vor dem Zubettgehen lieber noch schnell lesen und geistig abhaken. Kann man nicht ändern, muss ich hinnehmen.
Kundin schrieb mir um 21 Uhr eine E-Mail mit der Bitte um Unterlagen bis morgen früh 8.30 Uhr... Diese Allzeitverfügbarkeit erzieht Respekt vor dem Feierabend ab.
Lesen von Emails nach Feierabend
Nach dem Feierabend nach Hause gekommen, wollte Einkäufe auspacken und kochen, hatte aber mehrere Nachrichten auf dem Smartphone per WhatsApp und Facebook erhalten. Habe nach dem Auspacken somit erst geantwortet, wodurch sich das Kochen und das Essen um ca. eine halbe Stunde verzögert haben, Dies hat Unzufriedenheit ausgelöst, weil ich mich geärgert habe, in dem Moment die Priorität auf die Nachrichten gelegt zu haben. Es war eine wichtige Nachricht dabei, die anderen hätten noch warten können.
ständig Anfragen per mail bis in den Abend hinein
Terminverlegungen, die via Smartphone eingegangen sind
Während des Abends war der Laptop die ganze Zeit an. Zwischendurch habe ich Termine kontrolliert und E-Mails gescreent. Der Druck aufgrund noch unbearbeiteter E-Mails ist groß.
Wieder Mail bekommen, auf die meines Erachtens auch sofortige Antwort erwartet wurde
Wir haben im Büro mit 2 Kollegen bis 21.30 ein Konzept fertig gestellt. Ich hatte vorher ein ganztägiges Seminar. Mein Feierabend hat sich also um fast 4 Stunden verzögert. Ich war genervt, gestresst und sehr müde. Zuhause habe ich auch nochmal auf mein Dienst Handy geschaut.
zuhause noch emails bearbeitet und genervt auf die Vorstellungen eines Vorgesetzten reagiert
[…] Daraufhin Emails gecheckt, ob was Dringendes aufgelaufen ist. Morgen warten diverse Probleme auf mich...
Musste auf Mail einer anderen Kollegin reagieren, die eine Bitte für den nächsten Arbeitstag geschickt hat.

Positive Events

Table A3. Qualitative Statements Study 1A: Positive ICT Events, Sorted by Event Cluster

Positive ICT Events Reported in study 1A
P1 Multitasking Meeting
Beantwortung einer zeitkritischen Mail im Meeting, ohne die Weitergabe der Information hätte sich der Folgeprozess deutlich verzögert. Erleichterung, dass ich Termin einhalten kann.
Ich habe mein Blackberry im Kundenmeeting genutzt. Es war eine Arbeitserleichterung, da ich stets up to Date war. Aufgrund der Tatsache, dass das Gerät so klein ist, war es während des Meetings kein großer Störfaktor für meine Kollegen und den Kunde.
Ich konnte während eines Meetings nebenbei E-Mails lesen und beantworten. Mir ging nichts durch den Kopf. Im Nachhinein muss ich sagen, dass ich es als normal empfunden habe.
Ich war in einem Meeting und konnte trotz des Meetings meine eingehenden Emails checken.
Im Meeting ein anderes Meeting bestätigen
In einem langweiligen Meeting konnte ich Mails bearbeiten.
Mails lesen während eines Meetings
Spontane Teilnahme an einer Telefonkonferenz (Stammarbeitsplatz im Büro) - die Terminserie wurde daraufhin schon während des Termins an mich weitergeleitet, so wie die bisherigen Inhalte, so dass ich die Themen der Telko direkt mitlesen/und verstehen konnte und somit auch zukünftig an dieser Routine teilnehmen kann
während einer auswärtigen Klausurtagung konnte ich nebenbei einfache E-Mails bearbeiten
während einer Telefonkonferenz in einem anderen Chat wichtige Infos einholen zu können
Während eines Telefonats gleichzeitig Mails bearbeitet
Während ich am Festnetz telefonierte, konnte ich schnell ein paar Unterlagen zusammensuchen. Ich saß an meinem Schreibtisch und war alleine im Zimmer.
P2 Information Accessing
Bankverbindung über Smartphone herausfinden.
Der schnelle Zugriff auf Informationen. Auch das Vorhandensein von Informationen.
Dienstreise, daher nur verzögerter, direkter Netzzugang schneller Zugriff auf Emails und Termine via ipad erster Tag nach einem sehr erholsamen Urlaub, daher entspanntes Gefühl
Diese Fragen beantworten. Kundenfeedback direkt sehen
Direkter Austausch während eines Konferenzcalls, in dem ich kurzfristig aktuelle Informationen erfragen konnte.
Ich kann die Dateien, die ich morgen früh um 8.30 Uhr 150 km entfernt brauche, jetzt noch herunterladen...
Ich konnte heute mit Hilfe meines IPhones Von Pesos (Mexiko) in Euro umrechnen. Was sehr wichtig war für meine Arbeit.
Ich konnte noch nachsehen, ob eine Mietwagenbuchung vorgenommen werden konnte.
Mein verlorenes Gepäck wurde gefunden, was auf meinen online aufgegebenen Suchauftrag hin mir per Mail mitgeteilt wurde. Da habe ich mich gefreut.
Meldung vom Monitoring-System (automatische Überwachung der IT) auf dem Smartphone, dass ein (Server-)Dienst nicht korrekt funktioniert. - Wo haben Sie sich befunden (Ort, Anwesenheit anderer Personen)? Teeküche, alleine - Was ging Ihnen durch den Kopf? Was waren Ihre Wahrnehmungen und Gedanken? oh, wie ist denn das passiert? , muss ich gleich mal nachsehen, hm, warum sollte gerade das nicht gehen? wer hat was daran gemacht?
schnell im Internet hilfreiche Unterlagen zur Ausarbeitung einer Projektszkizze gefunden
Schnell Informationen von Mitarbeitern zu bekommen
Stand vor einer Packstation von dhl und nach der falschen Eingabe der pin war ich froh per smartphone bei dhl die Dinge zu regeln und die Sperrung meiner Karte rückgängig zu machen
Während eines Telefonates kurz per Chat oder SMS bei jedem eine Info zu hinterlassen.
War auf einer Dienstreise in Frankfurt und konnte trotzdem schnell Dokumente weiterleiten und jetzt an der Umfrage teilnehmen
Suchte den Namen einer Person bei einer Kundenveranstaltung - konnte schnell googlen.

Ich habe mein Smartphone heute für mehrere Dinge nutzen können -Unterwegs (Zug-)Verbindungen checken -unkompliziert navigieren können (Weg zum Termin finden) - schnell und unkompliziert Wegezeiten recherchieren
P3 Coordination
Aufgrund fehlender Materialien die nicht rechtzeitig eingetroffen sind, mussten unsere Monteure auf anderen Baustellen eingeteilt werden. Ich selbst befand mich im Büro. Unsere Monteure befanden sich auf der Baustelle. Der Kunde mit dem die Montagetermine abgestimmt werden mussten im Baubüro. Kontaktieren konnte ich unsere Monteure über das Smartphone, unseren Kunden per Mail (PC) bzw. ebenfalls über das Smartphone.
Die Mittagspausenfrage konnte per Mail geklärt werden und ein Termin schnell abgesagt werden
Direkte Absprache mit mehreren global verstreuten Stakeholdern via mail
Eine spontan einberufe Telefonkonferenz mit mehreren Teilnehmer aus unterschiedlichen Orten hat zu einer schnellen Klärung der Vorab per eMail versandten Dokumente geführt.
Ich habe mich an meinem Schreibtisch befunden und konnte per Fernschaltung auf meinem PC eine Projektplanung abstimmen.
Komplexe Terminabstimmungen mit Outlook, Versand von Inhalten an unterschiedl. Empfänger dadurch einheitl. Wissensstand
Kurzfristige Termin- und Inhaltsabstimmung über PC und Rückmeldung der angeschriebenen Teilnehmer von unterschiedlichen Situationen (vom Schreibtisch aus, von unterwegs mittels Smartphone. Tagsüber ist die Arbeit ohne PC /Outlook / Internet undenkbar.
Mehrere Telko, welche eine schnelle Abstimmung ermöglichten
Per Smartphone kurzfristig Montagetermine umgelegt
schnelle Koordination vieler voneinander ab- oder unabhängiger Informationsprozesse. Videokonferenzen Terminplanung
Termin einer Anlage wurde auf heute verschoben. via handy und email wurde die Absprache vereinfacht.
Terminabstimmungen
Terminabstimmungen mit Outlook, Termincheck mit Smartphone von unterwegs
Terminabstimmungen über Outlook mir diversen Teilnehmern
Unterlagen für ein Meeting am Donnerstag kurzfristig an 50 Teilnehmer nachgereicht per mail.
Versand von Infos an größere Verteiler per Outlook...
Termine vereinbaren (synchronisierter Kalender auf dem Smartphone), ohne den Rechner hochfahren zu müssen
Terminabstimmungen per Outlook
Klärung von Terminen per doodle und Outlook-Kalender
P4 Work Facilitation
- Löschen von Emails vor dem off. Hochfahren des Rechners -> Spam von wichtigen Mails trennen
Arbeit. Erledigen von Aufgaben. Eine Person (Kollege) anwesend. Keine besonderen Gedanken.
Auf der Arbeit. Es klappte irgendwann doch besser.
Büro der Mitarbeiter, Mitarbeiter, Anfrage kann schnell mit diesen geklärt werden
Büroalltag läuft damit schneller.
Das umfassende Archiv aus Dokumentenordnern und Outlook haben mir heute geholfen, eine bereits abmoderierte Aufgabe auf Wunsch noch einmal auszukramen und mithilfe der vorhandenen Dokumente auszuarbeiten und abzuschließen.
Dateien ordnen, danach alles schön übersichtlich
Dokumentationen (Fotos) von Arbeitsunterlagen konnte ich per Smartphone direkt und schnell an Kollegen senden, ohne sie zuvor auf den PC übertragen zu müssen. Erleichternde Zeitersparnis.
ein Programm update erleichtert für die Zukunft das Ausfüllen eines bestimmten Steuer Formulars durch Zufall entdeckt das hätte schon viel früher erfunden werden müssen
Eine Arbeitsgruppe, die im Zusammenspiel mit Internet und dortiger Informationsaufnahme ihrem Auftrag nicht so nachkam, wie es von mir beabsichtigt war konnte ich wegen unseres Webinterfaces zur platzbezogenen Internetfreischaltung die Ablenkungsquelle per Mausklick nehmen. Diese Technik habe ich vor 14 Jahre als ich an die Schule kam eingeführt. Bis heute hat sich das Prinzip erhalten und als positiv erwiesen. Es ist damit auch möglich nur einzelnen und wenigen die Internet bezogenen Aufgaben zu ermöglichen. Ein klärendes Gespräch mit der Arbeitsgruppe brachte dann schnell den erwünschten Erfolg. Die Sperre war nur von kurzer Dauer, aber wirksam. Diese Funktionalität damals in ein Netzwerk zu integrieren

war schon eine umfangreiche Aufgabe. Sie hat sich vielfach bewährt. Schüler kommen an die Passwort geschützte Oberfläche nicht heran. Manipulationen sind so gut wie ausgeschlossen. Mittlerweile gibt es elektronische pädagogische Netzwerksteuerungen auf Softwarebasis. Labor mit Schülern in Klassenstärke. Schülergruppen mussten Reste ermitteln und Dokumente abgeben. Insgesamt löste sich der Vorgang positiv für alle Beteiligten auf.
Emails über das Smartphone obgleich der Rechner nicht im Raum war
E-Mailverkehr war informativ
Erleichterung im Büroalltag.
Fertigstellung eines Dokuments am Arbeitsplatz
Flexibilität und Fortschritt bei Webkonferenz (lync)
Foto eines Tafelanschriebs zur Sicherung für Vorbereitung Folgeunterricht, Klassenarbeitsaufgaben und gedruckte Bereitstellung für die Klasse. Wo: Klassenraum Anwesende: Klasse mit 15 Schülern Kopf: Strukturierung des Tafelbilds mit Überschrift. Problematisierung, Sammlung von vorhandenen Kenntnissen. Verknüpfung mit anderen Lernsituationen. Bildhafte Beispiele aus dem Alltag mit Bezug zu Prüfungswissen und Fähigkeiten gesammelt auf der Tafel mit Folgeauftrag zu Übungen und Schlussfolgerungen. Ergebnis ist gleichzeitig Lernunterlage und Nachschlagewerk. Da ich in meiner Berufsschulzeit Normschrift erlernt habe und passabel zeichnen kann sind die verdichteten Sammlungen aus dem Unterrichtsablauf ausreichend übersichtlich. Aufträge zur thematischen Selbsterarbeitung inkl. kurzfristiger Handysurferlaubnis zum Thema und durch mich angeleiteten Sammlung der Ergebnisse wechseln dabei regelmäßig ab. Leider ist ein Großteil der Schüler auf effizientes Hotspot Lernen aus. Das Internet erleichtert diese Mentalität. Es wird immer nur so viel gegoogelt, dass es gerade so ausreicht. Hintergründe, existierende Systematik und Zusammenhänge bleiben in der heutigen Schnelllebigkeit uninteressant. Die Begeisterungsfähigkeit für Details und Forscherdrang sind bei meiner Klientel mittlerweile geringer als 10%. Nur bei Themen mit privatem Nutzen, schnellem Erfolg und geringer Frustration sind die Kandidaten intrinsisch dabei.
Fragen konnten per Mail geklärt werden
Freiheit bei der Arbeitsorganisation durch termin-, Task und Informationsmanagenent. Ort: Büro Personen: übrige m.a. des Unternehmens guter Arbeitsfluss, Möglichkeiten ohne Zeitdruck die Arbeit zu verteilen
Gesammelte Daten in einem Dokument ordnen - geht schnell und ist übersichtlich
gespeicherte Daten am PC aufgerufen, kein langes Suchen in alten Ordnern - Zeitersparnis
gutes task-wechseln durch Mehrgerätenutzung
Heute morgen bevor ich zur Arbeit ankam, wurde mein Lync repariert, daher konnte ich endlich wieder Kollegen anrufen und angerufen werden. ein tolles Gefühl!
ich arbeite den ganzen Tag mit diesen Medien
ich arbeite den ganzen Tag mit Notebook und Smartphone
ich arbeite den ganzen Tag mit Notebook und Smartphone
Ich arbeite immer nur mit Laptop, Telefon via Internet und Smartphone' es geht gar nicht ohne und das ist gut so und kein Stress.
Ich habe eine berufliche E-Mail am Arbeitsplatz erhalten, über deren Inhalt ich mich gefreut habe, da endlich etwas erledigt wird, worauf ich schon länger warte.
Ich konnte auf dem kurzen Dienstweg eine Eingabe beim Betriebsrat tätigen. Ich war froh, dass ich das schnell lösen/abarbeiten konnte.
Ich konnte während des Laptop-Ausfalls meine Mails über mein Smartphone bearbeiten.
Ich nutze E-Mail regelmäßig, um Dinge zu klären. So auch heute während des ganzen Tages.
Ich selbst befand mich im Büro. Fotos die von unserem Monteur gemacht wurden konnte er mir per Smartphone zumailen. Diese konnte ich an unseren Hersteller weiterleiten und somit Fehler aufdecken bzw. kurzfristig beheben.
im Büro. Freigabe eines Dokumentes durch vorgesetzten veranlasst während Endredaktion durch PR-Abteilung noch lief. Hat geklappt. nicht so schlecht.
Kommunikation am Arbeitsplatz läuft schnell und reibungslos.
Kommunikation mit mehreren Personen, Austausch von Inhalten und Schaffung einer einheitlichen Info-Situation mittels PC/Outlook
Konnte Änderungswünsche des Kunden bei einer Webseite schnell weiterleiten, da die Änderungen mit Screenshoots schnell erklärt waren.
Konnte eine Präsentation halten
Konnte PC nutzen, um eine Datenanalyse zu machen

Kontaktaufnahme eines Dienstleisters per Skype, um einen Termin für ein Skype-Telefonat zu vereinbaren. Später dann der Call. Meiner Ansicht nach sehr effiziente Weise der Kommunikation über größere Entfernung. Chats sind z.B. hilfreich in der Hinsicht, dass im Gegensatz zu einem Anruf nicht gleich geantwortet werden muss und man somit die gegenwärtige Aufgabe erst beenden kann.
kurzer Anruf erfolgte ueber Smartphone und konnte dringendes aber kurzes Thema klaeren
Lob durch Kollegen, Satzzeichen machen viel aus bei Email oder SMS Nachrichten
Mails konnten schneller bearbeitet werden
Mehrere Telefonate und Emails mit Kollegen und Auftraggeber, die mich in einer meiner Aufgaben sehr weit gebracht haben.
Nach Abstimmung eines Verfahrens mit einem Kollegen konnte ich mit einer kurzen E-Mail an den aus dem Urlaub zurückgekehrten vorgesetzten eine hochgespielte Lage direkt und kurzfristig entschärfen. Ort mein Büro. Gedanke alles unter Kontrolle.
Nutze ich ausschließlich zum arbeiten
Omni Channel Nutzung
Online Marketing wäre ohne PC z.B. schwer möglich
Ort: Arbeitsplatz, habe versucht, jemanden anzurufen, um etwas Dringendes für Dienstagvormittag zu klären. Da keiner ran ging, habe ich eine E-Mail geschrieben, mein Anliegen erklärt und um Rückruf gebeten.
Ort: Arbeitsplatz (Therapiezentrum) Habe ein iPad in der Frühförderung eines kleinen Jungen genutzt. Tolle Möglichkeit, um Fokus und Konzentration spielerisch zu trainieren und Wissen zu vermitteln.
Per email auf PC Status Info zu eiligem wichtigem Vorgang erhalten. im Büro. Gutes Gefühl wenn's läuft und gleich auf dem Schirm ist.
Per E-Mail ließen sich viele Dinge schnell klären und gleichzeitig mit anderen Personen teilen.
per mail . Klärung dringender Sachverhalte in Abstimmung mit Zahlenmaterial anderer Unternehmen war alleine und habe mich im Büro an meinem Arbeitsplatz befunden
Reminder für Meeting auf dem Smartphone.
Schnelle Klärung einer recht komplizierten Anfrage über mein Handy.
Schnelle Kommunikation
Schnelle und zuverlässige Kommunikationswege privat und beruflich.
Telefonat mit DB zur Klärung einer Rechnungslegung, im Büro, alleine, erfreut, dass es so unkompliziert gelöst wurden konnte Telefonat mit Banker, im Büro, alleine erfreut wegen schneller Terminfindung
Termine checken Emails anschauen Personen Anrufen SMS schicken Infos nachschauen (Wörterbücher) Teils in Meetings - teils alleine in Büro Frage unten teils teils- gibt aber nur ja oder nein
Viel erledigt
virtuelle Schulung mit mehr als 40 Teilnehmern online - eine Stunde (ohne Anfahrt und Rückfahrt optimal für das Thema)
Wichtige Dinge erledigt
Wir arbeiten hauptsächlich mit PC, und kommunizieren nur in English. Somit wenn alles gut läuft macht es die Arbeit leichter. Dafür habe ich kein konkretes Beispiel, einfach nur eine allgemeine Feststellung.
Organisation von Arbeitsprozessen über Projektmanagement
P5 Personal Affairs at Work
am Arbeitsplatz im Großraumbüro mit den anderen Kollegen. Mit dem Smartphone konnte ich mein Mittagessen planen und mich mit meinen Freunden verabreden, am PC konnte ich mich von meiner Langeweile ablenken und unerlaubterweise an meiner Bachelorarbeit arbeiten; die Ablenkung vor der Langeweile war positiv und hat meinen Tag ein wenig verkürzt; dadurch habe ich auch wenig an diese Arbeit(sbelastung) gedacht; trotzdem ein wenig Unwohlsein, weil ich das Gefühl hatte unter Beobachtung zu stehen
Am Arbeitsplatz, am PC in der Mittagspause: Habe heute zur Abwechslung an meinem Schreibtisch mitgebrachtes Mittagessen verzehrt. Habe somit gleichzeitig News und Facebook Nachrichten nebenbei entspannt abfragen können. Ich mache das sonst auch, aber eher am Smartphone weil ich sonst nicht vor dem PC sitze zum Mittagessen. Am Smartphone ist alles kleiner und lädt nicht so schnell wie am PC, somit war es heute deutlich entspannter. Außerdem habe ich die Zeit für eine längere private Nachricht an einen sehr guten Freund genutzt und hatte somit das Gefühl, in der Pause noch etwas wichtiges Privates erledigt zu haben.
An der Arbeit ist es verboten privat Internet zu nutzen, ich musste aber dringend eine Reklamation aufgeben. Da war ich froh mein Smartphone nutzen zu können.

E-Mail wegen (privater) Wohnungssuche bekommen, Besichtigungstermin. Gab Energie für den weiteren Arbeitstag,
Habe in der Mittagspause bei einem guten Freund angerufen, um über mein Problem zu sprechen. Er hat mir zugehört, und ich war einfach froh, nicht komplett alleine dazustehen mit meinen negativen Gefühlen. Das Gespräch tat also gut, auch wenn es nur eine zeitweise Ablenkung war.
Heute früh im Büro konnte ich mich nach dem Befinden meiner Freundin erkundigen, mit Hilfe meines IPhones und mir einen wichtigen Termin im Kalender meines IPhones notieren für die nächsten Wochen.
Ich konnte private Sachen schnell klären und etwas organisieren, was ohne die Technik so nicht möglich gewesen wäre
ich war im Büro und konnte per WhatsApp schnell und parallel zur Arbeit Dinge mit meiner Familie regeln
Ich wurde von einem Headhunter kontaktiert (erste Kontaktaufnahme)
Im Büro ist es wichtig und unerlässlich, dass ich mein Kind immer und überall erreichen kann. So genießt er Freiheiten und ich habe trotzdem die Kontrolle aus der Ferne.
Im Büro, an der Bachelorarbeit gearbeitet und Erfolgserlebnisse gehabt. Es waren nur drei Leute anwesend aber in der anderen Bürohälfte. Habe mich erleichtert gefühlt endlich daran arbeiten zu können. Konnte Freunde per Handy um Hilfe bei Literatubeschaffung bitten
Mittagspause, im Pausenraum: Mittagessen allein, nebenbei News aus aller Welt und Sport gelesen, dadurch Ablenkung von den Aufgaben des Tages; zudem eine Nachricht an einen Freund geschrieben, der in einer anderen Stadt wohnt, persönlicher Kontakt tut gut
Mittagspause: Am PC, Freund hat auf eine dringende Anfrage meinerseits geantwortet. Gab mir Hilfestellung/Tipps für ein Problem (Literatursuche), das hat mich gefreut, weil es Zeit erspart hat und direkt weiterhalf. Zudem gut zu wissen, dass man sich auf jemanden verlassen kann und man eine schnelle Rückmeldung erhält.
Nachricht von Freunden
Private SMS auf's iphone: rasche Klärung, wer Tisch reserviert um am Folgetag das WM-Halbfinalspiel sehen zu können. Gedanke: cool dass wir das schnell vereinbaren können.
Smartphone: Mittags Nachricht/Post auf Facebook von Freund mit persönlichem Foto erhalten, das ans Wochenende erinnert hat, dadurch positive Gefühle ausgelöst.
What´s up. WE mit Freunden geplant, Gtalk. Kollegin zum Geburtstag gratuliert und über Ohre Beförderung erfahren
treffen mit einem freund für morgen per sms und dann telefonisch vereinbart. Ort im Büro.
P6 Availability Absence
- Erreichbarkeit, obwohl in einem längeren Meeting - ich konnte nichts wichtiges versäumen und war up to date
- Ich habe eine Führungskraft mobil auf Ihrem Smartphone erreicht, obwohl Sie außer Haus war. Ich konnte somit sehr schnelle eine Entscheidung von ihr bekommen und den Fall abschließen. Ohne Smartphone hätte ich bis zu Ihrer Rückkehr ins Büro warten müssen.
Arbeit vor Ort beim Kunden
Auf der Autobahn eine wichtige Anfrage erhalten, die mit dem direkten Zugriff auf meine E-Mails sofort erledigen konnte
auf Dienstreise war Smartphone sehr hilfreich, da kein angemeldeter PC möglich war
Checken von Mails und Social Networks in der Bahn, beim Einkaufen
Durch Emails auf Smartphone gibt es die Möglichkeit, auch bei temporärer Abwesenheit vom Arbeitsplatz ein Thema nicht aus dem Auge zu verlieren.
Für ein wichtiges Telefonat stimmte die die gespeicherte Telefonnummer nicht mehr. Auf der Webseite war ebenfalls keine neue Nummer vermerkt. Das direkte Wählen einer Rufnummer im Browser mit Impressumsseite ist ein angenehmer Vorgang. Leider stimmte die gespeicherte Nummer auch nicht. Erst durch einen Anruf zu Hause konnte ich die geänderte Nummer in Erfahrung bringen. Das Telefonat war schließlich möglich. Vor dem Telefonat hatte ich kurz meine Emails auf neue Emails überprüft. Der vorhandene Datentarif reicht dafür locker aus. Auf einem kleinen Verbindungsweg zwischen zwei Ringstraßen unter einem Baum mit Schutz vor leichtem Regenfall und guter Netzabdeckung war der Ort. Ich war allein. Einige Passanten und eine Kindergartengruppe gingen vorbei. Die Umgebungsbedingungen waren insgesamt gut gewählt. Ich konnte mich auf das Gespräch konzentrieren, das im Goßraumbüro so nicht möglich gewesen wäre. Die grüne Umgebung mit Wiese und Bäumen war sehr entspannend.

Für eine schwierige Gerichtsverhandlung hatte ich meiner Mitarbeiterin versprochen, sie - für den Fall der Fälle - in einer Verhandlungspause telefonisch zu beraten. Dieses Angebot hat sie auch angenommen. Angenehm bzw. positiv war für mich, dass ich nicht am Arbeitsplatz sitzen musste, um den möglicherweise eingehenden Anruf entgegen zu nehmen, sondern in die Mittagspause gehen konnte, während der die Mitarbeiterin auch prompt angerufen hat. Obwohl ich es nicht immer gut finde, in der Pause gestört zu werden und Anrufe zuweilen auch ignoriere, war es heute so, dass meine Zusage immer erreichbar zu sein, mich nicht in meinem weiteren Tagesablauf eingeschränkt hat.
habe auf die fertigstellung eines dokuments gewartet, habe es in der pause erhalten (smartphone), ich konnte kurz gegenlesen und es dann weiter senden. sehr praktisch. ohne smartphone hätte ich keine pause gemacht.
Ich befinde mich zur Zeit in Istanbul und betreue dort unseren Standort. Durch die Technologie kann ich auch meinen Heimatstandort im Auge behalten und bin, wenn ich wieder Dortmund komme, sofort im Thema.
ich bin aktuell auf Klausur und konnte via Smartphone eine Kundenanfrage kurzfristig und ohne vor Ort zu sein klären.
Ich konnte die Vorbereitung auf eine zweitätige Veranstaltung, die morgen beginnt, vieles von unterwegs, dem Büro in Berlin und auch noch am Veranstaltungsort regeln. Mails beantworten, Kundenanfragen bedienen und mit Kollegen und Kunden telefonieren.
Ich musste auf einen Rückruf warten, konnte dank Blackberry aber trotzdem wie geplant in die Mittagspause gehen, da ich ja erreichbar war
Ich war beim Bäcker und konnte einer verzweifelten Kundin helfen.
Ich war dienstlich unterwegs und hatte Zugriff auf meine Mails und konnte daher wichtige Themen bearbeiten
Ich war unterwegs und habe erfahren das eib Verkauf heute noch mehr Erlös bringt als in den nächsten Tagen
Ich wartete auf den Rückruf einer Kollegin, und ging währenddessen mit einem anderen Kollegen zum Mittagessen / Besprechung in ein Restaurant. Es war möglich, zwischendurch kurz den Eingang von E-Mails und Anrufen zu prüfen, um sicherzugehen, dass ich die Rückmeldung der Kollegin nicht versäume bzw. sie nicht vergeblich versucht, mich zu erreichen.
Im Meeting. Direkt danach habe ich einen Rückruf getätigt
im Rahmen einer Outdoor Veranstaltung blieb ich aufgrund der Mitfuehrung des Smartphones ueber die Geschehnisse im Buero auf dem Laufenden.
Im Schulungsraum. Mit der Organisatorin. Per telephone mit dem Admin gesprochen. Dachte mir: die arme wartende Teilnehmerin
Konnte heute Homeoffice machen - dank Laptop und Smartphone
Telco im Auto....Dienstreise
Unterwegs Emails lesen und beantworten
Im Ausland auf einer Dienstreise. Zusendung von Fotos der Familie
Mailbearbeitung von unterwegs mit Smartphone
Umleiten des Bürotelefons auf Handy ermöglicht flexible Arbeitszeitgestaltung
P7 Utilizing Idle Times
Arbeit im ZUg
Arbeit in anderem Büro / ZUg
Auf dem Weg zur Arbeit konnte ich Mails vor Arbeitsbeginn lesen und konnte daher pünktlich mit der eigentlichen Arbeit beginnen
Beantwortung von E-Mails in der Ubahn
die Wartezeiten am Flughafen konnte ich zur E-Mailbearbeitung gut nutzen. die Arbeit muss ich dann morgen nicht mehr erledigen. das erleichtert mich und gibt mir das Gefuehl produktiv zu sein.
Dringender Rückruf, unnötige Pausenzeiten durch Mailbearbeitung überbrückt
Flughafen , nutzung von EMail und Facebook
Ich befand mich am Flughafen und musste dringend eine spontane Reise für nächste Woche buchen. Ich habe unsere Sekretärin angerufen und die Buchung in Auftrag gegeben. Die Reise war innerhalb von 10 Minuten organisiert und ich kann jetzt entspannt ins lange Wochenende gehen.
Ich habe in der Bahn mit meinem Laptop gearbeitet. Ohne diese Möglichkeit hätte ich meine Arbeit heute nicht erledigen können.
ich hatte einen Arzttermin und konnte waehrend der Wartezeit E-Mails bearbeiten. ich habe mich gefreut, mit meinen Mitarbeitern kommunizieren zu koennen.
Ich war unterwegs zwischen 2 Standorten und konnte den weg nutzen, um einige Anfragen direkt zu klären (telefonisch und per Mail).

Kann Mails auch auf dem Weg zum Briefkasten checken und fix beantworten
Konnte E-Mails beantworten und telefonieren, während ich ein Essen für Kollegen vorbereitete
Konnte mittels Diensthandy und Freisprecheinrichtung kurzen Stau nutzen, um auf dem Weg ins Büro eine Besprechung mit einer Kollegin abzuhalten.
kurze Durchsicht eines Angebotes während der Anreise zur Arbeit.Gut genutzte Zeit im Stau.
London Heathrow Flughafen. Konnte am Laptop emails machen
Mein PC wurde von dem IT-Department im Büro überprüft/Repariert. Ich konnte allerdings auf meinem Blackberry meine eingehend Emails weiter bearbeiten.So konnte ich die Wartezeit sinnvoll nutzen.
Pause eines Workshops, andere Personen waren anwesend. Endlich schnell ein paar Mails schicken und beantworten. Dadurch später weniger Arbeit.
Ubahn, Lesen von Mails und interessanten Artikeln
unterwegs Artikel lesen und chatten können war heute schön. auch schnell Antwort geben zu können hat mich heute erleichtert.
Unterwegs in der S-Bahn: Mails und Facebook Nachrichten schreiben, mit google maps navigieren
Während einer Dienstreise konnte ch mich auf eine Telko vorbereiten indem ich die neuste Version einer Präsenttion zur Vorbereitung lesen konnte.
Wichtiges Telefonat unterwegs geführt
auf die Autofähre gewartet, man kann mit dem Handy gut zeit überbrücken
Ich konnte auf meiner Zugfahrt weiterhin meine Emails checken und Aufgaben im Team koordinieren. So bleibt nichts liegen, und ich kann entspannt in mein langes Wochenende starten.
Könnte diese Befragung erledigten
Mailfach schon einmal durchgesehen bei Anreise zum ARbeitsort, das vereinfacht den STart im Büro
Positive Evening ICT Events
P8 Continuing Work Tasks (POS)
Froh, dass ich die Klärung eines wichtigen Punktes in meinen Feierabend schieben konnte, da ich dadurch einen privaten Termin wahrnehmen kann, ohne etwas zu verpassen oder zu verzögern.
Homeoffice, keine Leute anwesend. Arbeiten am Laptop
Alleine Zuhause. Konnte Dokumente mit dem Smartphone abfotografieren und per E-Mail ans Büro senden. Habe so Zeit gespart.
Beantwortng des Fragebogens
Die Umfrage per IPhone machen zu können
erstellung einer wichtigen präsentation am firmennotebook
ich habe zuhause noch einige Aufträge abgearbeitet, um beruhigter ins Wochenende zu gehen und Sachen abzuarbeiten, die am Montag aufgrund einer Dienstreise nicht bearbeitet werden können
ich konnte nach einer Dienstreise (5 h im Auto gefahren) noch zuhause meine E-Mails checken. Ich habe gedacht, dass ich das, was ich heute Abend erledige, morgen nicht mehr machen muss.
Ich konnte noch was zu Hause erledigen, ohne im Büro sein zu müssen. Mein Sohn war zeitweise bei mir.
Ich konnte weiter- und weiterarbeiten, die Arbeit erledigt sich ja nicht von selbst, nur weil offiziell Feierarbend ist.
Ich musste ein Dokument einscannen und verschicken. Dies konnte ich mit einer Scan-App schnell und problemlos machen, ohne den PC hochfahren zu müssen. Das war das erste was ich gemacht habe, als ich nach Hause in meine Wohnung kam und damit hatte ich es erledigt und runter von der ToDo-Liste.
Konnte den Abend mit Familie und Freunden verbringen und parallel Meeting für morgen vorbereiten.
Konnte früher gehen und von Zuhause später weiterarbeiten
Konnte noch eine ausstehende Anfrage beantworten.
Kontrolle der Mails aufgrund Arzttermins am Nachmittag.
Letztlich habe ich alle Informationen doch trotz aller Widerstände gefunden und zusammengetragen. Das ist also schon mal erledigt und das befreit mich.
Meine online-Hausaufgaben für meinen von der Firma gesponserten Sprachkurs, welche ich bequem von uu Hause über meinen privaten Laptop machen konnte.
nachbereitung des arbeitstages in der fußballkneipe, handy als hotspot fürs notebook. email ablage
Nutze immer den laptop zur heimarbeit

P9 Availability at Home
Ich hatte heute einen Tag frei und konnte eine Personalfragestellung kurzfristig mit Mitarbeiterin und Personalabteilung klären, während ich am Urlaubsort unterwegs war.
21 uhr, kurzes telefonat zur abstimmung für einen kundentermin morgen mit einem kollegen auf dem rückweg vom externen termin.
Anfrage eines Kollegen, schnelle Absprache
Ankündigung einer morgigen Reise in einer Telefonkonferenz. Wichtig, damit mein Besuch nicht unangekündigt ist. Ich war schon zuhause. Orga konnte geklärt werden.
Austausch per Whatsapp zu Fußballergebnissen d. WM, emailcheck nach Dienstreise, statusupdate aktuelle Themen per SMS, Chat nach 2-tägiger Dienstreise / Workshop
Bearbeitung einiger Emails vor dem Schlafen gehen. Gedanke:gut, dass ich das heute noch gesehen habe. Hintergrund: relevant für Termin gleich am Morgen
Check der neuen emails via smartphone
Check eMails
E mail Check.
Einfache Klärung sofort und Haken dran machen!
Erfreuliche Meldung in Richtung Auftragserfüllung
ergebnisse des tages konnte ich via smartphone ueberpruefen
Fussball, Public viewing. Es war gut zeitig aus dem Büro gehen zu können und zu wissen, dass ich bei Bedarf abends noch reagieren könnte.
Gedankenautausch mit Kiollegen
Ich konnte durch meine Erreichbarkeit einem Kollegen helfen
Ich konnte nach Feierabend noch eben einen Termin für morgen machen. Die Person war vorher nicht erreichbar.
Ich saß beim Friseur und habe meine Emails auf mein Handy gelesen, dabei habe ich eine Information gelesen bzgl einer Mitarbeiterin gelesen, die mich besorgt hat. Eine Kollegin war mit mir unterwegs und hatte per Zufall mit meiner Mitarbeiterin zuvor gesprochen und konnte mir zusätzliche Informationen geben, die mich wieder beruhigt haben. Ich habe im Anschluß die Mitarbeiterin angerufen und sicher gestellt, dass es ihr gut ging. Sobald ich ihre Bestätigung hatte, dass es ihr gut geht, konnte ich mich voll und ganz ins Wochenende mit einem guten Gefühl verabschieden.
Ich war erfreut nach Feierabend von einer Mitarbeiterin noch eine Nachricht zu erhalten
Ich war mit einer Kollegin in der Stadt und konnte per E-Mail noch ein wichtiges Thema klären… Das hat mich entspannt
Klärung offener Fragen per E-Mail mit meinem Vorgesetzten, Ort: Hotel, Gedanken: froh, die Fragen geklärt zu haben und positives Feedback erhalten zu haben
Küche, kurzer Blick bei dem Zurechtlegen der Tasche, amüsiert aufgrund Vorschlag von Kollegen
kurze abstimmung um 21h bzgl. eines Termins am Folgetag.
Kurzfristige Information erhalten
Kurzfristigen Termin noch bestaetigt bekommen
Schneele Informationen aus dem Netz.
schnellere Beantwortung von 6 Anfragen
Tablet, schnelle Beantwortung einer dringenden Rückfrage im Rahmen eines wichtigen Projektes Zuhause, allein War froh, diese wichtige Information erhalten zu haben und umgehend meine Einschätzung geben zu können
Termincheck mit smartphone
über meine To-Do Liste auf dem Smartphone konnte ich mit meinem Chef im Hotel noch schnell Fragen klären
Weiterleitung einer Präsentation an einen Kollegen.
wichtige Dinge klären können
Zuhause, auf dem Sofa, nochmals Mails gecheckt, erleichtert festgestellt, dass sich manche Dinge geklärt hatten.
P10 Personal Affairs at Home
Auf dem Sofa, beim Fernsehen. Freundin anwesend. Nichts besonderes
auf der fahrt zu einem privaten treffen den genauen ort vereinbart mit smartphone. hoffte dass mein vorschlag für die location akzeptiert wird. glück gehabt

Austausch mit Freund im whatsapp
Austausch mit Freunden und Familie über Fußball WM Ergebnisse
beim Spaziergang Musik gehört
Beim Treffen mit Freunden spontan Dinge recherchieren können, die das Gespräch weiterbringen. Gemeinsam Urlaubsfotos am Smartphone anschauen.
Call from nephew
Daheim mit meinem besten kumpel telen und alltagsdinge bequatschen. Gemeinsames hobby das Fahrradfahren auswerten.
Dinge, die spannend waren wurden den Freunden nicht nur mitgeteilt sondern auch gezeigt,
Ein Geduldsspiel am tablet
Facebook, whatsapp
habe einer Kollegin per SMS zum Geburtstag gratuliert - sie hatte heute Urlaub und tagsüber bin ich nicht dazu gekommen
Handy raus, 5:0 für Deutschland, klasse!
Ich hatte meinen Trainingsplan auf meinem IPhone geladen und konnte so mein Training absolvieren und die Pausen stoppen.
Ich konnte mit zwei Freundinnen aufeinmal heute Abend eine Unterhaltung führen.
Ich konnte noch schnell mehrere Dinge nachschauen. Öffnungszeiten und auch Angebote
Ich war im Auto unterwegs und benötigte eine Handynummer, die ich nicht gespeichert hatte, diese konnte ich per SMS erfragen und dann Geburtstagsglückwünsche per SMS verschicken
Ideenaustausch mit freunden beim Essen
Immer das Web verfügbar
In der Öffentlichkeit, viele Menschen anwesend, hab kaum noch jemanden um mich herum wahrgenommen, war erfreut, weil ich Freunden gute Nachrichten überbringen konnte
Kauf eines online tickets Onlinebestellung Tägliche Nachrichten lesen
kontakt mit wichtigem menschen gehabt. tut gut
Kontaktnzu freunden in der heimat
man konnte dem anderen sagen, dass man zu spät zum treffen kommt.
Nachrichten boten Kontakt zu Menschen, die ich seit längerem nicht gehört hatte. Dadurch waren meine Gedanken, dass die dafür aufgebrachte Zeit nicht völlig umsonst war.
Neues Macbook installiert, dabei einige Blocker (bisherige Probleme) gelöst.
notizen emails infos im web
online banking, zuhause, zwischendurch eine Überweisung erledigt, für die ich sonst in eine Filiale des Kreditinstituts fahren müsste
Ort: Zuhause Nutzung von Skype über Smartphone. Sehr dankbar für diese Möglichkeit!!
Ort: Zuhause Nutzung von Skype-App auf Smartphone Einfaches und kostenfreies Telefonieren in die USA. Freue mich sehr über diese Möglichkeit!
Ort: Zuhause Situation: Habe Skype genutzt, um mit meinem Freund in den USA zu telefonieren. Bin sehr dankbar für diese großartige und kostenfreie Kontaktmöglichkeit!! Macht die Entfernungsüberbrückung um einiges einfacher!
Ort: zuhause, Situation: Terminvereinbarung mit Versicherungsberater (nach 21 h), Gedanke: wie ist wohl meine Life-Work-Balance?
priv. terminorganisation
private infos per smartphone ausgetauscht. tut gut.
skype anruf mit Mutter auf dem iPad
Telefonat mit dem Lebenspartner
zeitung lesen wetterbericht
Zu Hause allein, Kontakt zu alten Freunden via Handy, habe mich sehr über die Nachricht gefreut, habe die ersten Teile meiner ba geschafft, mit dem pc geschrieben
zu hause, fussball gucken. kinder dabei. korrespondenz mit der erkrankten freundin. gutes gefühl per whatsapp in kontakt zu bleiben
zugriff auf relevante infos navisystem
Zuhause nach Rückkehr von der Arbeit: Nachrichten von zwei Freunden aus der Heimat erhalten, einem habe ich schriftlich geantwortet, mit der anderen habe ich daraufhin telefoniert. Dadurch fühlte ich mich

heimischer, geborgener, hatte Kontakt zu vertrauten Personen, was meine Stimmung nach dem Arbeitstag gehoben hat. Auch wenn es dabei um ein Gespräch ging, in der die Probleme einer anderen Person im Mittelpunkt standen, so war mir dieses Problemgespräch noch lieber, als gar kein Kontakt zu einer vertrauten Person.
Zuhause, allein, streamen von guten videos
Zuhause, allein,unterhaltsame Videos,Freude angenehme Anspannung
Zuhause,allein,lustige videos

Appendix 3: Questionnaire of Study 3 in English, Chinese and German

The following table displays the complete questionnaire that was used in study 3. The questionnaire is provided in all three languages in order to allow for languages comparisons.

Table A4. Questionnaire of Study 3 in English, Chinese and German

Scale	Items	Answer Scale
Actual Segmentation	English: I don't think about work while I'm at home. Chinese: 我在家的时候，不去想工作上的事。 German: Ich denke zu Hause nicht an die Arbeit. English: I keep work life at work. Chinese: 我把工作和家庭生活清晰地分隔开。 German: Ich lasse das Arbeitsleben am Arbeitsplatz. English: I don't let work issues creep into my home life. Chinese: 我不把工作的事情带到我的家庭生活中。 German: Ich lasse es nicht zu, dass sich berufliche Angelegenheiten in mein Privatleben schleichen. English: I am able to leave work behind when I go home. Chinese: 我回到家后，会将工作方面的事情抛在脑后。 German: Ich kann die Arbeit hinter mir lassen, wenn ich nach Hause gehe.	5 point Likert Scale from strongly agree to strongly disagree
Segmentation Preference	English: The following questions deal with what you prefer. Chinese: 以下的问题询问你对工作和家庭关系如何处理的偏好。 German: Die folgenden Fragen beziehen sich darauf, was Sie bevorzugen. English: I don't like to have to think about work while I'm at home. Chinese: 我不喜欢在家里的时候还想着工作上的事。 Ich mag es nicht, Zuhause an die Arbeit denken zu müssen. English: I prefer to keep work life at work. Chinese: 我喜欢把工作和家庭生活清晰地分隔开。 German: Ich ziehe es vor, das Arbeitsleben am Arbeitsplatz zu lassen. English: I don't like work issues creeping into my home life. Chinese: 我不愿意工作的事情搅和到家庭生活中。 German: Ich mag es nicht, wenn sich berufliche Angelegenheiten in mein Privatleben schleichen. English: I like to be able to leave work behind when I go home. 我喜欢回到家后，会将工作方面的事情抛在脑后。	1 strongly disagree 2 disagree 3 neutral 4 agree 5 strongly agree

Scale	Items	Answer Scale
	German: Ich mag es, die Arbeit hinter mir zu lassen, wenn ich nach Hause gehe.	
ICT Frequency	English: How often do you work from home using ICT (mobile phones, pads, laptops, PC)? Chinese: 你在家使用信息沟通设备（包括手机、平板、笔记本电脑、台式机）进行工作的频率如何？ German: Wie häufig arbeiten Sie von zu Hause mittels Informations- und Kommunikationstechnologien (IKT) (Mobiltelefone, Tablets, Laptops, PCs)?	1 Seldom or Never 2 A few times a month 3 A few times a week 4 Almost every day 5 Everyday
ICT Events	English: The following items refer to ICT-related events that may occur during private time. Please indicate for each event how often it occurs. Chinese: 以下项目询问你在下班后使用信息沟通设备的情况。请根据你的状况回答。 使用的频率 German: Bitte geben Sie im Folgenden an, wie häufig die genannten Situationen auftreten. Continuing Tasks English: I finish work tasks during private time using ICT (i.e. postprocessing/ preparation of work day) Chinese: 下班后，我使用信息沟通设备完成工作任务（例如：继续处理或准备工作）。 German: Ich nutze in der Freizeit Informations- und Kommunikationstechnologien, um Arbeitsaufgaben abzuarbeiten (z.B. Nachbereitung/ Vorbereitung des Arbeitstages) Receiving Work Calls English: I receive work calls during private time Chinese: 我在下班后会接到工作来电。 German: Ich erhalte Arbeitsanrufe während der Freizeit. Receiving Work Emails English: I receive (urgent) work emails during private time. Chinese: **我在下班后会收到**（紧急的）工作邮件。 German: Ich erhalte (dringende) Arbeitsemails während der Freizeit.	1 Seldom or Never 2 A few times a month, 3 A few times a week 4 Almost every day 5 Everyday
ICT-mediated BMT	English: The following items refer to your **use of mobile devices** for work and private correspondence Chinese: 以下是一些针对你如何使用移动设备来处理工作和家庭事务的问题，请根据你的状况回答。 German: Die folgenden Fragen beziehen sich auf Ihre Nutzung von mobilen Geräten für berufliche und private Korrespondenz. BMT1 Separate Devices English: I use separate mobile phones for work and private correspondence.	0 No 1 Yes

Scale	Items	Answer Scale
	Chinese: 我在工作和家庭生活中使用不同的手机（或手机号）。 German: Ich nutze separate Mobiltelefone für berufliche und private Korrespondenz	0 No 1 Yes
	BMT2 Separate Accounts English: I have different accounts (e-mail, instant messaging) for work and private issues. Chinese: 针对工作或个人生活，我会使用不同的账号（邮件、即时通讯工具等）。 German: Ich benutze unterschiedliche Accounts (Email, Instant-Messagers etc.) für private und berufliche Korrespondenz.	0 I do not have a separate work mobile phone. 1 Never, 2 rarely, 3 occasionally, 4 often, 5 almost always
	BMT3 Switch off English: When I leave work, I switch off my work mobile phone. Chinese: 下班后，我会关掉用于工作的手机（或手机号）。 German: Nach der Arbeit schalte ich mein arbeitsbezogenes Mobiltelefon aus	0 No 1 Yes
	BMT4 Automatic Update English: I automatically update work messages on my devices. Chinese: 我在自己的移动设备上设置了工作信息的自动更新。 German: Ich nutze Funktionen zur automatischen Abrufung/ Aktualisierung von Arbeitsnachrichten auf meinen Geräten (Push-Funktion).	
ICT-mediated BMT (contd.)	BMT5 Replying to Messages English: To what extent do you respond to work messages after work? (Please select the **one** answer that is most appropriate) Chinese: 下班后，你在多大程度上响应工作信息（信息包括通过微信、短信、电子邮件、QQ等发来的信息）（请选择最适合你实际情况的选项）？ German: Inwieweit beantworten Sie arbeitsbezogene Nachrichten nach der Arbeit? (Bitte wählen Sie die Antwort aus, die am meisten zutrifft).	See left column
	1 = I do not read work-related messages after work at all. 下班后，我根本不会再看和工作有关的信息。 1 = Ich lese nach der Arbeit überhaupt keine arbeitsbezogenen Nachrichten.	
	2 = I seldom read and answer any work message 我很少阅读或回复工作信息。 2 = Ich lese und beantworte selten arbeitsbezogene Nachrichten.	
	3 = I read and selectively answer work messages 下班后，我会选择性地阅读和回复工作信息。	

Scale	Items	Answer Scale
	3 = Ich lese und beantworte arbeitsbezogene Nachrichten selektiv. 4 = I read and answer most work messages. 我阅读并回复大部分的工作信息。 4 = Ich lese und beantworte die meisten arbeitsbezogenen Nachrichten. 5 = I read and answer all work messages 我阅读并回复所有的工作信息。 5 = Ich lese und beantworte alle Arbeitsnachrichten.	
ICT-mediated BMT (contd.)	BMT6 Answering Calls English: To what extent do you respond to work calls after work? (Please select one answer) Chinese: 下班后，你在多大程度上响应工作来电？ German: Inwieweit nehmen Sie arbeitsbezogene Anrufe nach der Arbeit an? (Bitte wählen Sie die Antwort aus, die am meisten zutrifft). 1 = I ignore incoming calls or switch off the device 下班后，我会忽略工作来电或者关机。 1 = I ignoriere eingehende Arbeitsanrufe oder schalte das Gerät aus. 2 = I only answer urgent or important work calls 我仅仅回复紧急或重要的工作来电。 2 = Ich nehme nur dringende oder wichtige Anrufe an. 3 = I selectively answer work calls after checking the display. 我会在浏览来电显示后，有选择地接听工作来电。 3 = Ich nehme Anrufe selektiv an, nachdem ich die Nummer auf dem Display überprüft habe. 4 = I answer most work calls. 我接听大多数的工作来电。 4 = Ich nehme die meisten Arbeitsanrufe an. 5 = I answer all incoming work calls after work. 我会接听所有的工作来电。 5 = Ich nehme alle arbeitsbezogenen Anrufe nach der Arbeit an.	See left column
WHC	English: The demands of my work interfere with my home and family life. Chinese: 工作上的需要影响了我的家庭生活。 German: Die Anforderungen meiner Arbeit beeinträchtigen mein Privatleben. English: The amount of time my job takes up makes it difficult to fulfill family responsibilities.	1 Never, 2 rarely, 3 occasionally, 4 often, 5 almost always

Scale	Items	Answer Scale
	Chinese: 工作占用我大量的时间，使我难以履行家庭责任。 German: Die Zeit, die mein Job in Anspruch nimmt, macht es mir schwer, familiäre/ private Verpflichtungen zu erfüllen. English: My job produces strain that makes it difficult to fulfill family duties. 工作上产生的压力使我很难履行家庭职责。 Mein Job verursacht Belastungen, die es mir erschweren familiäre/ private Verpflichtungen zu erfüllen.	
Satisfaction with WLB	English: Please indicate your level of satisfaction regarding the following statements. How satisfied are you with… Chinese: 请评价你对以下各方面的满意程度。 Bitte geben Sie an, wie zufrieden Sie damit sind …. English: … the way you divide your time between work and personal or family life Chinese: 你的时间在工作和家庭生活两方面的分配状况 German: … wie Sie Ihre Zeit zwischen Arbeit und Privat-/Familienleben aufteilen. English: … the way you divide your attention between work and home Chinese: 你的注意力在工作和家庭两方面的分配状况 German: … wie Sie Ihre Aufmerksamkeit zwischen Arbeit und Privat-/Familienleben aufteilen. English: … how well your work life and your personal or family life fit together Chinese: 你的工作和家庭两方面相互匹配的程度 German: … wie Ihr Arbeitsleben und Ihr Privat-/ Familienleben zusammenpassen. English: … your ability to balance the needs of your job with those of your personal or family life Chinese: 你平衡工作需要和家庭需要的能力 … wie Sie die Bedürfnisse des Jobs mit denen des Privat-/Familienleben in der Waage halten. English: … the opportunity you have to perform your job well and yet be able to perform home-related duties adequately Chinese: 你干好工作同时又履行好家庭相关责任的机会 German: … mit den Möglichkeiten, die Sie haben, Ihre Arbeit gut zu erledigen und trotzdem private Verpflichtungen adäquat zu erledigen.	1 very dissatisfied 2 dissatisfied 3 neutral 4 dissatisfied 5 very satisfied
Work-Family Guilt	English: I regret not being around for my family as much as I would like to. Chinese: 我后悔没能像自己希望的那样尽可能地陪伴家人。 German: Ich bereue es, dass ich nicht so viel für meine Familie da sein kann wie ich es gerne würde.	0 does not apply to me 1 strongly disagree 2 disagree 3 neutral 4 agree 5 strongly agree

Scale	Items	Answer Scale
	English: I feel guilty for not being able to take care of my child(ren) as well as I would like to. Chinese: 我内疚没有像自己希望的那样尽可能好地照顾孩子。 German: Ich fühle mich schuldig, dass ich mich nicht so viel um meine Kinder kümmern kann, wie ich es gerne würde. English: I feel bad because I frequently have to take time away from my family to deal with issues happening at work. Chinese: 我常常不得不牺牲家庭时间去响应工作上的事，这让我感觉糟糕。 German: Ich fühle mich schlecht, weil ich regelmäßig Familienzeit opfern muss, um mich um Arbeitsangelegenheiten zu kümmern. English: I feel guilty for not showing as much interest to my spouse / partner as I wish. Chinese: 我不能像我希望的那样去关心自己的另一半，对此我感到内疚。 German: Ich fühle mich schuldig, da ich meinem Partner/ meiner Partnerin nicht so viel Aufmerksamkeit schenke, wie ich gerne würde.	
Detachment	English: After work I get a break from the demands of work. Chinese: 下班后，我能放下工作，休息一下。 German: Am Feierabend gewinne ich Abstand zu meine beruflichen Anforderungen. English: After work I distance myself from my work Chinese: 下班后，我让自己远离工作。 German: Am Feierabend gelingt es mir, mich von meiner Arbeit zu distanzieren. English: After work I forget about work. Chinese: 下班后，我暂时忘记工作。 German: Am Feierabend vergesse ich die Arbeit. English: After work I don't think about work at all Chinese: 下班后，我根本不再想工作。 Am Feierabend denke ich überhaupt nicht an die Arbeit.	1 Never, 2 rarely, 3 occasionally, 4 often, 5 almost always
Collectivism	English: Family welfares is more important than individual rewards Chinese: 家庭的幸福比个人的收益更加重要。 German: Das Familienwohl ist wichtiger als individuelle Anerkennung. English: Individuals should only pursue their goals after considering the welfare of their family. Chinese: 个人应该在顾及家庭的整体福利后，才追求他们自己的目标。 German: Individuen sollten ihre eigenen Ziele nur nach Berücksichtigung des Familienwohls verfolgen.	1 strongly disagree 2 disagree 3 neutral 4 agree 5 strongly agree

Scale	Items	Answer Scale
	English: Individuals need to sacrifice their own goals for the benefits of family. Chinese: 为了家庭，个人可能需要牺牲自己的目标。 German: Individuen müssen ihre eigenen Ziele zum Wohle der Familie opfern.	

Appendix 4: Interaction Effects Study 3

Table A5. Interaction between ICT Frequency and Nationality on Work-Home Conflict

	Work-Home Conflict			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	2.93***	0.08	2.85***	0.09
Working hours	0.25***	0.05	0.25***	0.05
Nationality	0.01	0.11	0.06	0.12
ICT frequency	0.25***	0.06	0.09	0.10
ICT frequency x nationality			0.23+	0.12
R^2	0.16		0.17	

Notes. Unstandardized coefficients are reported. *** p < .001; ** p < .01; * = p < .05.; + = p. < .10

Table A6. Interaction between BMT5 and Nationality on Work-Home Conflict

	Work-Home Conflict			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	2.92***	0.08	3.00***	0.09
Working hours	0.28***	0.05	0.28***	0.05
Nationality	0.03	0.12	0.01	0.12
BMT5 Replying to Messages	0.17**	0.06	0.30**	0.09
BMT5 Replying to Messages x nationality			-0.24*	0.12
R^2	0.13		0.14	

Notes. Unstandardized coefficients are reported. *** p < .001; ** p < .01; * = p < .05.; + = p. < .10

Table A7. Interaction between ICT Frequency and Nationality on Work-Life Balance

	Work-Life Balance			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	3.32***	0.07	3.44***	0.07
Working hours	-0.32***	0.04	-0.32***	0.04
Nationality	0.03	0.09	-0.04	0.10
ICT frequency	-0.02	0.05	0.22**	0.08
ICT frequency x nationality			-0.34**	0.10
R^2	0.15		0.18	

Notes. Unstandardized coefficients are reported. *** p < .001; ** p < .01; * = p < .05.; + = p. < .10

Table A8. Interaction between *Continuing Tasks* and Nationality on Work-Life Balance

	Work-Life Balance			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	3.30***	0.07	3.38***	0.08
Working hours	-0.31***	0.05	-0.31***	0.05
Nationality	0.07	0.10	0.02	0.10
Continuing Tasks	-0.07	0.05	0.07	0.09
Continuing Tasks x nationality			-0.19+	0.11
R^2	0.15		0.16	

Notes. Unstandardized coefficients are reported. *** p < .001; ** p < .01; * = p < .05.; + = p. < .10

Table A9. Interaction between ICT Frequency and Nationality on Work-Family Guilt

	Work-Family Guilt			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	2.56***	0.12	2.42***	0.13
Working hours	0.27**	0.08	0.26**	0.08
Nationality	0.62***	0.16	0.70***	0.17
ICT frequency	0.12	0.08	-0.17	0.14
ICT frequency x nationality			0.42*	0.17
R^2	0.13		0.15	

Notes. Unstandardized coefficients are reported. *** p < .001; ** p < .01; * = p < .05.; + = p. < .10

Table A10. Interaction between *Receiving Calls* and Nationality on Detachment

	Detachment			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	3.21***	0.08	2.96***	0.12
Working hours	-0.19***	0.05	-0.18***	0.05
Nationality	0.40**	0.12	0.61***	0.14
Receiving Calls	-0.22***	0.06	-0.58***	0.15
Receiving Calls x nationality			0.42**	0.16
R^2	0.09		0.11	

Notes. Unstandardized coefficients are reported. *** p < .001; ** p < .01; * = p < .05.; + = p. < .10

Table A11. Interaction between BMT5 and Nationality on Detachment

	Detachment			
	Predictor Model		Interaction Model	
	Est.	*SE*	*Est.*	*SE*
Intercept	3.20***	0.08	3.12***	0.08
Working hours	-0.17***	0.05	-0.18***	0.05
Nationality	0.42***	0.11	0.44***	0.11
BMT5 Replying to Messages	-0.27***	0.06	-0.39***	0.08
BMT5 Replying to Messages x nationality			0.23*	0.11
R^2	0.12		0.13	

Notes. Unstandardized coefficients are reported. *** p < .001; ** p < .01; * = p < .05.; + = p. < .1