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Are the Effects of Work-related Extended Availability the Same for Everyone?

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A B S T R A C T

Work-related extended availability (WREA) describes a state of being available for work matters while physically being in a different life domain. There is ample evidence for the negative effects of WREA, but moderator effects of personal attributes have largely been neglected. The current study examined the impact of neuroticism and segmentation preferences on the relationship between WREA and psychological detachment, sleep problems, and emotional exhaustion. We assumed that WREA would be associated with all three criterion constructs and that these relationships would be moderated by neuroticism and segmentation preferences. These hypotheses were tested with multiple regression and moderated hierarchical regression analysis in a sample of 276 employees. While there was a significant association between WREA and detachment, WREA did not directly predict sleep problems or exhaustion. However, we found an indirect effect of WREA on sleep problems via detachment. Neuroticism and segmentation preferences moderated the association between WREA and exhaustion. While the association between WREA and detachment was robust, WREA predicted emotional exhaustion only for people high in neuroticism or with high segmentation preferences. We suggest that employees who prefer segmenting work and private life should be taken seriously and not be contacted in their leisure time.

¿Son iguales para todos los efectos de la disponibilidad laboral prolongada?

R E S U M E N

La disponibilidad laboral prolongada (DLP) se refiere a estar disponible para trabajar durante el tiempo libre. Si bien se conocen los efectos negativos de la DLP, se han descuidado los atributos personales como moderadores. Examinamos el impacto del neuroticismo y las preferencias de segmentación sobre la relación entre la DLP y la desconexión, los problemas del sueño y el agotamiento emocional. Asumimos que la DLP estaría asociada con los tres constructos criterio y que estas relaciones estarían moderadas por el neuroticismo y las preferencias de segmentación. Pusimos a prueba las hipótesis con análisis de regresión múltiple y análisis de regresión jerárquica moderada en una muestra de 276 empleados. Si bien encontramos una asociación entre la DLP y la desconexión psicológica, la DLP no predijo directamente los problemas de sueño o de agotamiento aunque sí encontramos un efecto indirecto de la DLP en los problemas de sueño a través del distanciamiento. Las preferencias de segmentación y neuroticismo moderaron la relación entre la DLP y el agotamiento. Si bien la asociación entre la DLP y la desconexión era robusta, la DLP predijo el agotamiento solo en personas con neuroticismo elevado o con preferencias de segmentación elevadas. Sugerimos que se tome en serio a los empleados que prefieran segmentar el trabajo y la vida privada y no ponerse en contacto con ellos en su tiempo libre.

Due to the rise and growing adoption of modern “information and communication technologies” (ICT), the world of work is changing ever more rapidly and with these changes work demands are evolving as well (Duranova & Ohly, 2016). With the large-scale dissemination of smartphones and other portable devices, employees are, at least in principle, always and everywhere available for work. Employees can accept work-related phone calls when they are at home, shopping, or at the playground with their children. They can read work-related emails and short-messages while commuting, during commercial breaks, or before going to bed. The initiator of contact

does not need to be a supervisor, calls of colleagues and customers can be equally intrusive. This new phenomenon has been referred to as “extended availability for work” (Dettmers et al., 2016) or “work-related extended availability” (WREA; Pangert et al., 2016). WREA is conceptualized as a state of being disposable for work-related matters while being physically situated in a different domain. In contrast to on-call work, it is an informal form of availability (Pangert et al., 2016) which is usually not compensated for and due to its informal nature at least in practice often not subject to the regulations of working time legislation.

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There is ample evidence that WREA might be harmful to employee health, well-being, and life-domain balance. [Arlinghaus and Nachreiner \(2013, 2014\)](#) have analyzed representative data from a European-wide survey and found that even a small amount of work contact during leisure time raises the odds for the occurrence of multiple physical and psychological health impairments. Availability expectations, actual work contact, and work-related smartphone use in leisure time seem to be related to problems with detaching from work ([Derks & Bakker, 2014](#); [Derks, Brummelhuis, et al., 2014](#); [Derks, van Mierlo, et al., 2014](#); [Dettmers et al., 2016](#); [Mellner, 2016](#)), sleep problems ([Arlinghaus & Nachreiner, 2014](#); [Bowen et al., 2018](#)), emotional exhaustion ([Dettmers et al., 2016](#); [Dettmers, 2017](#); [Piszczek, 2017](#); [Xie et al., 2018](#)), stress ([Arlinghaus & Nachreiner, 2014](#); [Voydanoff, 2005](#)) and “work-family conflict” (WFC; [Bowen et al., 2018](#); [Derks & Bakker, 2014](#); [Derks et al., 2016](#); [Dettmers, 2017](#); [Voydanoff, 2005](#)).

Current Research

While there is abundant evidence for negative consequences of WREA, the role of interindividual differences in personality and attitudes has been neglected to date. To our knowledge, there are only two studies ([Butts et al., 2015](#); [Piszczek, 2017](#)) that have investigated in how far personal preferences regarding separation or integration of work and private life (i.e., segmentation preferences) moderate the relationship between availability for work and health related outcomes. But in fact, it is reasonable to assume that interindividual differences either in personality or attitudes augment or reduce the impact of WREA on employee health. As [Butts et al. \(2015\)](#), [Piszczek \(2017\)](#), and [Derks et al. \(2016\)](#) have shown with segmentation preferences ([Kreiner, 2006](#)), attitudes concerning the interplay between work and private life have an impact on the relationship between availability for work and relevant outcomes. In [Butts et al.'s \(2015\)](#) study, segmentation preferences moderated the within-person relationship between time spent working with ICT from home and WFC. However, the authors failed to find a moderator effect for either happiness or anger. [Piszczek \(2017\)](#) found some evidence that segmentation preferences moderate the indirect effect of work-family technology use on emotional exhaustion via WFC, although the overall interaction effect was nonsignificant. [Derks et al. \(2016\)](#) found a significant moderator effect of segmentation preferences on the relationship between work-related smartphone use and WFC. Thus, although moderator effects of segmentation preferences on the relationship between forms of WREA and WFC have been found, evidence for health-related variables as outcomes is still scant.

While there is at least some evidence for moderator effects of segmentation preferences on the relationship between WREA and relevant outcome variables, there is virtually none for personality traits, which is astonishing given that personality strongly impacts how employees experience work demands and whether they feel strained by them ([Györkös et al., 2012](#)). Personality traits influence emotion regulation strategies ([Kokkonen & Pulkkinen, 2001](#)), coping behaviors ([Connor-Smith & Flachsbart, 2007](#)), and how people respond to external stimuli ([Bolger & Schilling, 1991](#)). Affective events theory ([Weiss & Cropanzano, 1996](#)) explicitly models personality traits as moderator variables on the relationship between job events and affect at work. Events at work are thought of as the proximal causes for affect, but the actual impact of a given event is influenced by an interaction between dispositions and situational stimuli ([Weiss & Cropanzano, 1996](#)). The same principle may also apply to WREA: work contact per se might not impair employee health, but how workers deal with it, which, in turn, is likely to be influenced by personality variables.

The aim of the current study is, thus, to address the questions of whether and to what extent interindividual differences in personality and attitudes influence the relationship between WREA and relevant

health-related outcomes. Uncovering such differences among employees could help identify individuals at risk for developing mental health issues from WREA and enable practitioners to draft specifically targeted interventions to help such individuals learn setting boundaries to protect their well-being and long-term health.

Work-related Extended Availability

As indicated above, WREA in the narrow sense refers to an availability of workers for work-related matters beyond the boundary of work domain, i.e., accepting work-related contacts during leisure time. Note that these work-related contacts can occur through different communication channels (e.g., phone, email, short-messages) and can be initiated by different sources (e.g., colleagues, customers, supervisors).

Border theory ([Clark, 2000](#)) and boundary theory ([Ashforth et al., 2000](#)) both assume that different life domains – or the social roles associated with them – are separated by temporal, spatial, or psychological borders and these borders can differ in strength. The strength of borders is determined by their flexibility and permeability ([Clark, 2002](#)). The concept of flexibility refers to the degree borders are pliable in terms of time and space ([Ashforth et al., 2000](#)) and allow being relaxed to meet the demands of another domain ([Bulger et al., 2007](#)), whereas permeability means that elements from one domain can pass through the boundary into the other domain ([Clark, 2000](#)). A strong border is characterized by a low degree of flexibility and permeability, whereas a weak border is highly flexible and permeable ([Clark, 2000](#)). ICTs play an important role here: on the one hand, they facilitate an employee-oriented ([Hornung et al., 2008](#)) flexibilization of working time and place, which can be beneficial for workers (e.g., [Hill et al., 2010](#)); on the other hand, they also make the border between work and private life more permeable. Permeability of the home boundary is a necessary, but not sufficient condition for WREA. An individual's home boundary may potentially be highly permeable, for instance, when a person is expected to always carry a company-owned smartphone. In this case, the person can be easily contacted for work-related matters during leisure time. However, this person can still decide whether or not to answer the phone to the point of never picking up (i.e., never actually being available). In addition to boundary permeability, there also has to be some kind of motivation for employees to be available for work-related matters during their leisure time. Currently, there is no specific theory pointing to why employees may do this. However, there are some empirical findings suggesting a variety of different motives. For instance, a study by [Pauls et al. \(2019\)](#) suggests that contextual performance may be of importance: in a sample of IT workers, they found that perceived responsibility for emergencies at work positively predicted WREA, although there was no contractual obligation to be available for emergencies. Others' expectations seem to be another important aspect. [Adkins and Premeaux \(2014\)](#) found explicit expectations to stay connected to work to be a predictor for higher levels of connectivity behaviors. Last, but not least, work overload seems to be a crucial factor: employees who do not manage to finish all their work in the office tend to take certain work tasks (e.g., reading work-related emails) home and do them during their leisure time ([Pauls et al., 2019](#); [Thörel et al., 2020](#)).

Boundary theory suggests that weak boundaries between roles from different domains may lead to role conflicts and make it difficult to disengage from a particular role ([Ashforth et al., 2000](#)). Moreover, certain cues such as role-specific persons or objects may trigger unwanted role transitions that are associated with domain-related cognitions ([Ashforth et al., 2000](#)). From this we can conclude that WREA may cause involuntary transitions from roles individuals are momentarily enacting in private life to the role of company employee and that these roles transitions bring up work-related thoughts, which

should make mental distancing (i.e., psychological detachment) from work difficult. Not being able to detach from work, on the other hand, is associated with a wide array of negative consequences, including sleep problems and emotional exhaustion (Wensche & Lohmann-Haislah, 2017), so it is reasonable to assume that WREA may have far-reaching consequences for employees.

Psychological Detachment from Work

Psychological detachment goes beyond the mere physical absence from work and refers to a state where an employee is “mentally” disengaged from work (Sonnetag & Fritz, 2007). According to a recent meta-analysis (Wensche & Lohmann-Haislah, 2017), psychological detachment is positively associated with desirable health-related outcomes such as life satisfaction, well-being, sleep, and recovery, and negatively related to adverse outcomes such as burnout, physical discomfort, and fatigue.

A central problem with work contact after hours seems to be that it prevents employees from detaching from work. Dettmers et al. (2016) have shown that frequency of after-hour job contacts is negatively related to detachment. In the same vein, various studies (e.g., Derks & Bakker, 2014; Derks, Brummelhuis, et al., 2014; Derks, van Mierlo, et al., 2014; Mellner, 2016) have indicated that work-related smartphone use during off-job hours is negatively associated with psychological detachment from work. Thus, we expect that in our study a higher degree of WREA will be associated with less psychological detachment from work.

Hypothesis 1a: The extent of WREA is negatively associated with psychological detachment over and beyond the influence of overtime and socio-demographics.

Sleep Problems

Sleep problems are a common phenomenon, with about one third of the general population worldwide (Ohaydon, 2011) complaining at least sometimes about symptoms such as trouble falling asleep or waking up several times at night (Jenkins et al., 1988). With current societal changes accompanying digitalization, sleep problems may be even more common in a few years from now (Ferrie et al., 2011). Sleep problems are related to reduced well-being (Weinberg et al., 2016), depression (Baglioni et al., 2011), cardiovascular disease (Kwok et al., 2018), and a higher all-cause mortality in men (Medic et al., 2017), making it an important issue for physical and psychological health.

There is reason to believe that WREA is related to sleep problems. Meta-analytic evidence suggests that excessive technology use is associated with sleep disturbances (Mei et al., 2018), and most work-related contact in leisure time nowadays takes place via information and communication technologies. Moreover, there already is some evidence indicating that work contact in leisure time might be related to negative sleep outcomes (e.g., Arlinghaus & Nachreiner, 2014; Bowen et al., 2018). Accordingly, we assume that in our study WREA predicts sleep problems.

Hypothesis 1b: The extent of WREA is positively associated with sleep problems over and beyond the influence of overtime and socio-demographics.

Another issue is the question of how and why accepting work-related contacts in leisure time could be connected with sleep problems. It is well established that psychological detachment from work is positively related to sleep quality (Wensche & Lohmann-Haislah, 2017) and negatively to sleep problems (Mellner et al., 2016). Furthermore, as shown above, availability for work during leisure time is negatively associated with psychological detachment. Moreover, Barber & Jenkins (2014) found a significant mediator effect of working at home with information and communication technologies on sleep via psychological detachment. Therefore, we assume an indirect effect

of WREA on sleep problems which is mediated by psychological detachment.

Hypothesis 1c: The relationship between the extent of WREA and sleep problems is mediated by psychological detachment.

Emotional Exhaustion

Emotional exhaustion is one of the three facets of burnout (Maslach & Jackson, 1981) and is conceptualized as a state of depleted energy assumed to be induced by excessive psychological and emotional demands on the job (Jackson et al., 1987). Emotional exhaustion has serious negative consequences for private and professional life. Jensen (2016) showed in a cross-lagged design that emotional exhaustion was related to later WFC, and Cropanzano et al. (2003) found negative associations with organizational commitment and job performance and positive associations with turnover intentions.

As detailed above, work contact in leisure time interferes with recovery processes, and it is therefore plausible that WREA is positively related to emotional exhaustion. Empirically, most prior research suggests that this might in fact be the case. Dettmers et al. (2016), Dettmers (2017), and Piszczek (2017) detected positive associations between availability expectations and exhaustion. Derks, van Mierlo, et al. (2014) and Xie et al. (2018) found work-related technology use at home to be positively related to exhaustion. In two studies (Collins et al., 2015; Ragsdale & Hoover, 2016), though, more work-related cellphone use was associated with “less” exhaustion. However, Collins et al. (2015) only had a small sample ($n = 94$) and in Ragsdale and Hoover (2016) exhaustion was no longer predicted by work-related cellphone use when cellphone attachment was controlled for. Thus, we assume a positive relationship between WREA and exhaustion.

Hypothesis 1d: The extent of WREA is positively associated with emotional exhaustion over and beyond the influence of overtime and socio-demographics.

Neuroticism

Neuroticism is one of the five higher order facets of the Five Factor Model of Personality (McCrae & Costa, 1987). People high in neuroticism tend to be more anxious, hot tempered, and have more problems dealing with stress and with controlling their impulses (Costa & McCrae, 1980; McCrae & Costa, 1991) than people low in neuroticism. Accordingly, neuroticism may be considered a vulnerability factor and has been shown to moderate the relationship between predictor variables and outcomes in a variety of contexts. For instance, in Wang et al. (2011) neuroticism moderated the relationship between job stress and negative work-to-family spillover, with men high in neuroticism exhibiting more negative behaviors in the first hour after work towards their family than men low in neuroticism.

It is plausible that neuroticism serves as a moderator in the relationship between WREA and relevant health-related outcomes. People high in neuroticism react more strongly to negative events (Bolger & Schilling, 1991) and they might also react more strongly to work-related demands they are exposed to in their leisure time than individuals low in neuroticism. Moreover, availability for work-related matters during leisure time is potentially stressful (Voydanoff, 2005) and workers need to employ suitable coping strategies and regulate their emotions to properly detach from work, sleep, and maintain their long-term health. Neuroticism is negatively related to healthy coping strategies and positively associated with problematic coping behaviors (Connor-Smith & Flachsbart, 2007). Additionally, highly neurotic individuals tend to have difficulties regulating their emotions (Kokkonen & Pulkkinen, 2001). We expect that individuals high in neuroticism have more problems dealing with WREA than individuals low in neuroticism.

Hypothesis 2a: The relationship between WREA and psychological detachment from work is moderated by neuroticism such that people higher in neuroticism will have more problems detaching from work.

Hypothesis 2b: The relationship between WREA and sleep problems is moderated by neuroticism, such that people higher in neuroticism will have more sleep problems.

Hypothesis 2c: The relationship between WREA and emotional exhaustion is moderated by neuroticism such that people higher in neuroticism will be more exhausted.

Segmentation Preferences

Boundary theory suggests the existence of interindividual differences in the preference for integrating or segmenting life domains and its associated roles (Ashforth et al., 2000). Segmentation preferences describe the degree to which an individual desires to erect and maintain boundaries between work and private life. Integrating or segmenting roles is not inherently good or bad, but it is important that the workplace can meet an employee's preference (Kreiner, 2006). Studies show that a fit between a person's segmentation preferences and the possibilities to actually segment work and private life is associated with reduced WFC (Chen et al., 2009; Kreiner, 2006), a lower amount of stress, and higher job satisfaction (Kreiner, 2006).

As detailed above, in the studies of Butts et al. (2015) and Derks et al. (2016) segmentation preferences moderated the relationship between work-related ICT or smartphone use and WFC. It is plausible that segmentation preferences also moderate the relationship between WREA and health-related outcomes. WREA implies that the home boundary is permeable. While this should not be an issue for individuals with low segmentation preferences, because they prefer integrating work and private life, people inclined to keep work and private life separate might experience distress by the blurring of boundaries (Kreiner, 2006). Although the interaction in Piszczek (2017) was non-significant, the author reports some circumstantial evidence for a moderator effect: when looking at the conditional indirect effects of work-related ICT use on emotional exhaustion, Piszczek (2017) only found the indirect effect for individuals with high and low, but not for participants with medium segmentation preferences. When segmentation preferences were high, the relationship was positive; when they were low, the relationship was negative. Considering these results from prior research, we assume that segmentation preferences moderate the relationship between WREA and our criterion constructs.

Hypothesis 3a: The relationship between WREA and psychological detachment from work is moderated by segmentation preferences such that people with stronger segmentation preferences will have more problems detaching from work.

Hypothesis 3b: The relationship between WREA and sleep problems is moderated by segmentation preferences, such that people with stronger segmentation preferences will have more sleep problems.

Hypothesis 3c: The relationship between WREA and emotional exhaustion is moderated by segmentation preferences, such that people with stronger segmentation preferences will be more exhausted.

Method

Participants and Procedure

Data were collected via an online survey on Unipark, a professional service provider for hosting scientific surveys. Two strategies were used to obtain a convenience sample of employees working a minimum of 20 hours per week. First, recruiters used personal contacts to enlist suitable participants, and second, recruiters posted links to the study on social media sites such as Facebook. On the first page of the survey, participants were informed about the study, assured of the confidentiality of their answers and that they could cease

participation anytime without providing reasons. The questionnaire contained questions regarding segmentation preferences, the extent of availability, several personality measures, and scales tapping various outcomes. The survey took between 10 and 20 minutes to complete.

In total, 644 people clicked the link to the study, and 372 of those started the survey. Of these $n = 61$ were excluded because they did not finish the questionnaire and had more than 30% missing values. Further 35 cases were excluded because they indicated either being self-employed ($n = 11$), students ($n = 10$), unemployed ($n = 1$), or they did not provide any information on their current job status ($n = 13$). The remaining 276 participants were on average 40.6 ($SD = 13.0$) years of age and primarily female (58%). Overall, the sample was well educated (almost half had at least a bachelor's degree), and came from a wide variety of occupational backgrounds (e.g., administration, IT, banking, nursing, construction, education, police). Seventy seven percent of the participants indicated working fulltime (37.5 hours or more per week according to their contract), 12% between 30 and 37 hours, and 11% between 20 and 30 hours per week. There were no significant differences between fulltime and part-time employees in any of the main study variables except for sleep problems ($M = 2.6$ vs. $M = 2.4$, $p = .04$). On average, participants worked 4.5 ($SD = 5.4$) hours overtime per week and all but four indicated owning either a smartphone ($n = 257$) or a cell phone ($n = 15$).

Measures

WREA. The extent of WREA was operationalized as the number of accepted work-related contacts in a typical week. These contacts were measured with three items from Pauls et al. (2017) asking for the number of accepted work-related phone calls as well as emails and short messages read during leisure time (before work, while commuting, after work, and on days off). For each item, participants could enter a figure. The correlations between these items were $r = .14$ between emails and short messages, $r = .27$ between emails and phone calls, and $r = .78$ between phone calls and short messages. The three items were aggregated into the total number of accepted work-related contacts per week.

Psychological detachment from work. Detachment was measured with the German version of the four-item detachment subscale of the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007). The items assess the extent to which participants can mentally distance from work. The answers were provided on a Likert scale from 1 (*never*) to 5 (*always*). In the current study, Cronbach's alpha was .90, in the original validation study by Sonnentag and Fritz (2007) .89.

Sleep problems. Sleep problems were measured with four items adapted from Jenkins et al. (1988). Participants evaluated four statements indicating trouble falling asleep, waking up several times at night, but being able to continue sleeping quickly, waking up at least once a night and having trouble to continue sleeping, and waking up too early without being able to fall asleep again. Answers were provided on a Likert scale from 1 (*never*) to 5 (*always*). In the current sample, Cronbach's alpha was .78.

Emotional exhaustion. Emotional exhaustion was assessed with the German version (Büssing & Glaser, 1998) of the five-item emotional exhaustion subscale of the Maslach Burnout Inventory - GS (MBI; Schaufeli et al., 1996). The items were answered on a Likert scale from 1 (*never*) to 6 (*very often*). In past research, the subscale had internal consistencies between $\alpha = .84$ to $\alpha = .91$ (Leiter & Schaufeli, 1996). In the current sample, Cronbach's alpha was .89.

Neuroticism. Neuroticism was measured with the 12-item neuroticism subscale of the German version (Danner et al., 2016) of the BFI-2 (Soto & John, 2017). Answers were provided on a five-point Likert scale ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). Cronbach's alpha in the evaluation study (Danner et al., 2016) was .88 and in the current sample .90.

Table 1. Means and Correlations

| | <i>M (SD)</i> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------------------|---------------|------|------|------|------|------|------|-----|------|-----|----|
| 1. WREA | 6.28 (7.59) | - | | | | | | | | | |
| 2. Detachment | 3.58 (0.83) | -.34 | .90 | | | | | | | | |
| 3. Sleep problems | 2.42 (0.88) | -.07 | -.18 | .78 | | | | | | | |
| 4. Exhaustion | 3.43 (1.09) | -.02 | -.31 | .44 | .89 | | | | | | |
| 5. Neuroticism | 2.49 (0.69) | -.17 | -.22 | .46 | .62 | .90 | | | | | |
| 6. Segmentation | 3.70 (1.09) | -.34 | .13 | .19 | .30 | .23 | .91 | | | | |
| 7. Overtime | 4.51 (5.41) | .53 | -.29 | -.00 | -.03 | -.18 | -.24 | - | | | |
| 8. Age | 40.59 (13.03) | .10 | .10 | .10 | -.10 | -.11 | -.21 | .11 | - | | |
| 9. Gender | - | .30 | -.01 | -.15 | -.13 | -.26 | -.13 | .21 | .24 | - | |
| 10. Employment | - | .08 | -.03 | -.13 | -.02 | -.11 | .06 | .08 | -.12 | .32 | - |

Note. All correlations > |.11| are significant at the .05 level; all correlations > |.15| are significant at the .01 level; alpha coefficients are provided along the diagonal; gender was coded female = 0 and male = 1; employment was coded 0 = part-time, 1 = fulltime.

Segmentation preferences. Segmentation preferences were tapped with a German version of the 4-item scale by Kreiner (2006). The items assess the degree to which participants prefer to segment or integrate work and private life. Answers were provided on a Likert scale ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). In Kreiner's (2006) study and in our sample Cronbach's alpha was .91.

Control variables. We also asked for demographics including age, gender, and the contractual and actual working time from which we computed overtime. Overtime served as a control variable to ensure that WREA was associated with the outcome variables not solely due to a higher amount of extra hours worked per week.

Statistical Analysis

All analyses were conducted with SPSS 26. Hypotheses 1a, 1b, and 1d were tested by using ordinary multiple regression. We used bootstrapping to overcome potential problems with standard errors due to the non-normality of regression residuals. In each model, as the first step, overtime, sex, and age were entered as control variables and in the second step, the overall extent of availability was added

as the predictor. Hypothesis 1c was tested by using the process plugin by Hayes (2013) with the overall extent of availability as predictor, detachment as mediator, sleep problems as the criterion construct, and the three control variables as covariates. Hypothesis 2a through 3c were also tested with the process plugin. In each of the six models one of the three criterion variables (detachment, sleep problems, exhaustion) was entered as the outcome, the extent of work-related availability as independent variable, either neuroticism or segmentation preferences as the moderator and overtime, age, and sex as covariates.

Results

All means, standard deviations and correlations between study variables are presented in Table 1.

Preliminary Analyses

Missing values. After removing the 61 participants who failed to finish the study and had more than 30% missing values (see above),

Table 2. Results for the Regression Analysis on Detachment, Sleep Problems, and Emotional Exhaustion

| | Psychological detachment | | | | | Sleep problems | | | | | Emotional exhaustion | | | | |
|---------------------------------------------------------------------------------------------------|--------------------------|-------------|---------|----------|------------------------------------------------------------------------------------------------|-------------------------|-------------|---------|----------|------------------------------------------------------------------------------------------------|------------------------|-------------|---------|----------|----------|
| | <i>b</i> | <i>SE b</i> | β | <i>t</i> | <i>p</i> | <i>b</i> | <i>SE b</i> | β | <i>t</i> | <i>p</i> | <i>b</i> | <i>SE b</i> | β | <i>t</i> | <i>p</i> |
| Model 1 | | | | | | | | | | | | | | | |
| Employment | 0.01 [-0.22, 0.25] | 0.12 | .01 | 0.09 | .93 | -.017 [-0.45, 0.16] | 0.16 | -.08 | -1.23 | .29 | 0.03 [-0.29, 0.35] | 0.16 | .01 | 0.15 | .86 |
| Overtime | -0.05 [-0.07, -0.03] | 0.00 | -.31 | -5.33 | .00 | 0.01 [-0.02, 0.03] | 0.01 | .03 | 0.48 | .68 | 0.00 [-0.02, 0.03] | 0.01 | .00 | 0.02 | .99 |
| Age | 0.01 [0.00, 0.02] | 0.00 | .13 | 2.21 | .03 | 0.00 [-0.01, 0.01] | 0.01 | .03 | 0.47 | .70 | -0.01 [-0.02, 0.01] | 0.01 | -.07 | -1.12 | .30 |
| Gender | 0.03 [-0.20, 0.25] | 0.11 | .02 | 0.28 | .82 | -0.25 [-0.50, -0.08] | 0.13 | -.14 | -2.07 | .06 | -0.26 [-0.56, 0.07] | 0.16 | -.12 | -1.75 | .11 |
| Model 2 | | | | | | | | | | | | | | | |
| Employment | 0.00 [-0.23, 0.22] | 0.12 | .00 | 0.01 | .99 | -.017 [-0.45, 0.16] | 0.15 | -.08 | -1.26 | .28 | 0.02 [-0.29, 0.35] | 0.16 | .01 | 0.14 | .87 |
| Overtime | -0.03 [-0.05, -0.01] | 0.01 | -.18 | -2.71 | .01 | 0.01 [-0.02, 0.04] | 0.01 | .07 | 0.96 | .37 | 0.00 [-0.03, 0.03] | 0.02 | .01 | 0.10 | .94 |
| Age | 0.01 [0.00, 0.02] | 0.00 | .14 | 2.34 | .02 | 0.00 [-0.01, 0.01] | 0.01 | .03 | 0.49 | .67 | -0.01 [-0.02, 0.01] | 0.01 | -.07 | -1.12 | .30 |
| Gender | 0.12 [-0.10, 0.32] | 0.11 | .07 | 1.07 | .31 | -0.22 [-0.47, -0.04] | 0.13 | -.12 | -1.79 | .11 | -0.25 [-0.55, 0.06] | 0.16 | -.12 | -1.67 | .12 |
| WREA | -0.02 [-0.04, -0.01] | 0.00 | -.25 | -3.64 | .00 | -0.01 [-0.02, 0.01] | 0.01 | -.08 | -1.05 | .27 | 0.00 [-0.02, 0.02] | 0.01 | -.01 | -0.17 | .86 |
| Model 1: $R^2 = .11, p < .001$. Model 2: $R^2 = .15, p < .001$; R^2 -change = .04, $p < .001$ | | | | | Model 1: $R^2 = .03, p = .07$. Model 2: $R^2 = .04, p = .08$; R^2 -change = .00, $p = .29$ | | | | | Model 1: $R^2 = .02, p = .19$. Model 2: $R^2 = .02, p = .29$; R^2 -change = .00, $p = .87$ | | | | | |

Note. All confidence intervals were computed on the basis of 1,000 bootstrap samples; gender was coded female = 0 and male = 1; employment was coded 0 = part-time, 1 = fulltime.

Table 3. Results for the Moderation Analyses with Neuroticism as Moderator

| | Psychological detachment | | | | Sleep problems | | | | Emotional exhaustion | | | |
|-------------|--------------------------|-------------|----------|----------|------------------------|-------------|----------|----------|------------------------|-------------|----------|----------|
| | <i>b</i> | <i>SE b</i> | <i>t</i> | <i>p</i> | <i>b</i> | <i>SE b</i> | <i>t</i> | <i>p</i> | <i>b</i> | <i>SE b</i> | <i>t</i> | <i>p</i> |
| Employment | -0.02 [-0.25, 0.21] | 0.12 | -0.15 | .88 | -0.14 [-0.39, 0.12] | 0.13 | -1.09 | .28 | 0.07 [-0.19, 0.33] | 0.13 | 0.56 | .58 |
| Overtime | -0.03 [-0.05, -0.01] | 0.01 | -3.07 | .00 | 0.02 [-0.01, 0.04] | 0.01 | 1.61 | .11 | 0.02 [-0.01, 0.04] | 0.01 | 1.33 | .19 |
| Age | 0.01 [0.00, 0.02] | 0.00 | 2.16 | .03 | 0.00 [-0.00, 0.01] | 0.00 | 0.86 | .39 | -0.00 [-0.01, 0.01] | 0.00 | -0.74 | .46 |
| Gender | 0.01 [-0.20, 0.23] | 0.11 | 0.12 | .91 | -0.05 [-0.29, 0.19] | 0.12 | -0.43 | .67 | 0.04 [-0.21, 0.28] | 0.12 | 0.31 | .76 |
| WREA | -0.03 [-0.04, -0.02] | 0.01 | -4.25 | .00 | -0.00 [-0.00, 0.03] | 0.01 | -0.13 | .90 | 0.01 [-0.00, 0.02] | 0.01 | 1.78 | .08 |
| Neuroticism | -0.36 [-0.51, -0.22] | 0.07 | -5.01 | .00 | 0.58 [0.42, 0.74] | 0.08 | 7.28 | .00 | 0.98 [0.82, 1.16] | 0.09 | 11.35 | .00 |
| Interaction | -0.01 [-0.02, 0.01] | 0.01 | -1.16 | .25 | 0.01 [-0.00, 0.03] | 0.01 | 1.70 | .09 | 0.03 [0.01, 0.04] | 0.01 | 3.48 | .00 |
| | $R^2 = .23, p < .001$ | | | | $R^2 = .24, p < .001$ | | | | $R^2 = .42, p < .001$ | | | |

Note. All confidence intervals were computed on the basis of 5,000 bootstrap samples; gender was coded female = 0 and male = 1; employment was coded 0 = part-time, 1 = fulltime.

the extent of missingness was as low as 0.5%. Little's MCAR test was non-significant ($p = .08$), indicating that the null hypothesis that the data are missing completely at random was upheld. To prevent a loss of power, the missing values were imputed on the item level with the estimation maximization algorithm. Using multiple imputation was considered inconvenient because the process plugin (Hayes, 2013) cannot handle data that are completed with multiple imputation. If the amount of missingness is low (< 2%), the impact of the imputation procedure is negligible (Rubin et al., 2007), and estimation maximization is recommended as the best alternative to multiple imputation (Cheema, 2014). Nevertheless, to avoid the risk of bias, all analyses were carried out both with and without missing data. Using the original data with listwise deletion or the imputed data did not change any of the results, so it can be assumed that that the procedures are robust. In the following, only results with imputed data will be reported.

Outliers. Boxplots of all scales were inspected for extreme values and outliers. There were no problematic cases for either criterion or moderator variables. However, there were some extreme values per-

taining to the number of accepted work-related contacts. To avoid the possibility that a few cases with extraordinarily high values bias the analyses, all values exceeding the 90th percentile were winsorized to the value of said percentile.

Main Analyses

Hypothesis 1a: The hypothesis stated that the extent of WREA was negatively associated with psychological detachment over and beyond the influence of overtime and socio-demographics. The overall regression model (Table 2) without WREA as predictor was significant ($p < .001$) and explained 10.6% of the variance. By adding WREA as a predictor, the explained variance rose significantly to 14.8% (F -change = 13.33, $p < .001$) and the beta was significant ($\beta = -.25, p < .01$).

Hypothesis 1b: Hypothesis 1b stated that the extent of WREA is positively associated with sleep problems over and beyond the influence of overtime and socio-demographics. Contrary to our expectations, the overall regression model (Table 2) with WREA as predictor was nonsignificant ($p = .09$).

Table 4. Results for the Moderation Analyses with Segmentation Preferences as Moderator

| | Psychological detachment | | | | Sleep problems | | | | Emotional exhaustion | | | |
|-------------|--------------------------|-------------|----------|----------|------------------------|-------------|----------|----------|------------------------|-------------|----------|----------|
| | <i>b</i> | <i>SE b</i> | <i>t</i> | <i>p</i> | <i>b</i> | <i>SE b</i> | <i>t</i> | <i>p</i> | <i>b</i> | <i>SE b</i> | <i>t</i> | <i>p</i> |
| Employment | -0.02 [-0.26, 0.21] | 0.12 | -0.19 | .85 | -0.18 [-0.47, 0.13] | 0.15 | -1.24 | .22 | -0.00 [-0.30, 0.32] | 0.16 | -0.01 | .99 |
| Overtime | -0.03 [-0.05, -0.01] | 0.01 | -2.64 | .01 | 0.01 [-0.01, 0.04] | 0.01 | 1.17 | .24 | 0.01 [-0.02, 0.04] | 0.01 | 0.57 | .57 |
| Age | 0.01 [0.00, 0.02] | 0.00 | 2.21 | .03 | 0.01 [-0.00, 0.01] | 0.00 | 1.14 | .26 | 0.00 [-0.01, 0.01] | 0.01 | 0.06 | .95 |
| Gender | 0.11 [-0.11, 0.33] | 0.11 | 1.03 | .30 | -0.21 [-0.47, 0.05] | 0.13 | -1.62 | .11 | -0.23 [-0.53, 0.06] | 0.15 | -1.51 | .13 |
| WREA | -0.03 [-0.04, -0.01] | 0.01 | -3.47 | .00 | 0.00 [-0.01, 0.02] | 0.01 | 0.50 | .62 | 0.02 [0.00, 0.04] | 0.01 | 2.19 | .03 |
| Seg. pref. | -0.03 [-0.07, 0.13] | 0.05 | 0.53 | .60 | 0.17 [0.06, 0.27] | 0.05 | 3.26 | .00 | 0.33 [0.20, 0.46] | 0.07 | 5.10 | .00 |
| Interaction | -0.01 [-0.02, 0.00] | 0.01 | -1.60 | .11 | 0.01 [0.00, 0.02] | 0.01 | 2.08 | .04 | 0.02 [0.01, 0.04] | 0.01 | 3.03 | .00 |
| | $R^2 = .16, p < .001$ | | | | $R^2 = .08, p < .001$ | | | | $R^2 = .14, p < .001$ | | | |

Note. All confidence intervals were computed on the basis of 5,000 bootstrap samples; gender was coded female = 0 and male = 1; employment was coded 0 = part-time, 1 = fulltime.

Hypothesis 1c: The hypothesis posited that the relationship between the extent of WREA and sleep problems is mediated by psychological detachment. Although the overall effect of WREA on sleep problems was nonsignificant, a significant total effect is not a prerequisite for the existence of an indirect effect (Hayes & Rockwood, 2017). The overall regression model proved significant ($R^2 = .08, p < .001$) and the bootstrap interval for the indirect effect, $b = 0.001$, did not include zero [0.001, 0.011], indicating significant mediation (Hayes & Rockwood, 2017). The direct effect was also significant, albeit in the opposite direction, $b = -.01 [-.03, -.00], p = .04$.

Hypothesis 1d: The hypothesis stated that the extent of WREA is positively associated with emotional exhaustion over and beyond the influence of overtime and socio-demographics. Contrary to our expectation, the overall regression model (Table 2) with WREA as predictor was nonsignificant ($p = .29$).

Hypothesis 2a: Hypothesis 2a stated that the relationship between WREA and psychological detachment from work is moderated by neuroticism such that people higher in neuroticism will have more problems detaching from work. The overall regression model (Table 3) was significant ($p < .001$) and explained 23% of the variance. However, contrary to our hypothesis, the interaction term was nonsignificant ($b = -0.007 [0.02, 0.01], p = .24$).

Hypothesis 2b: The hypothesis posited that the relationship between WREA and sleep problems is moderated by neuroticism such that people higher in neuroticism will have more sleep problems. The overall regression model (Table 3) was significant ($p < .001$) and explained 24% of the overall variance. Nonetheless, contrary to our assumptions, the interaction effect was nonsignificant ($b = 0.013 [0.00, 0.03], p = .09$).

Hypothesis 2c: Hypothesis 2c stated that the relationship between WREA and emotional exhaustion is moderated by neuroticism such that people higher in neuroticism will feel more emotionally exhausted. The overall regression model (Table 3) was significant ($p < .001$) and explained 42% of the variance. As hypothesized, the interaction was significant ($b = 0.027 [0.01, 0.04], p < .001$). When neuroticism was low ($b = -0.008 [0.02, 0.01], p = .28$) or medium ($b = 0.011 [0.00, 0.02], p = .08$), there was no effect of WREA on exhaustion. However, there was a significant effect when neuroticism was high ($b = 0.029 [0.01, 0.05], p < .01$ (Figures 1-3).

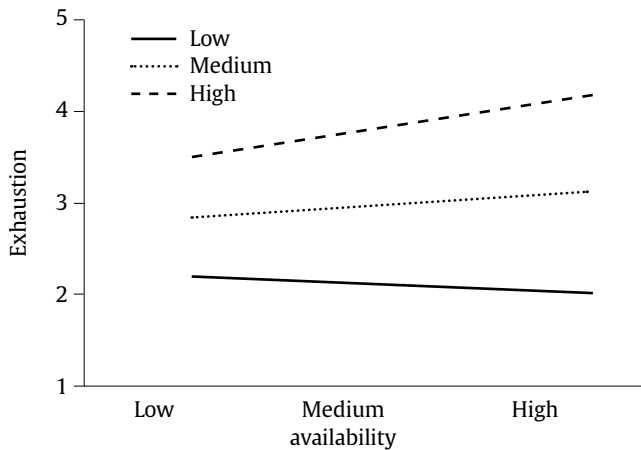


Figure 1. Simple Slopes for the Effect of WREA on Emotional Exhaustion on Different Stages of the Moderator Neuroticism.

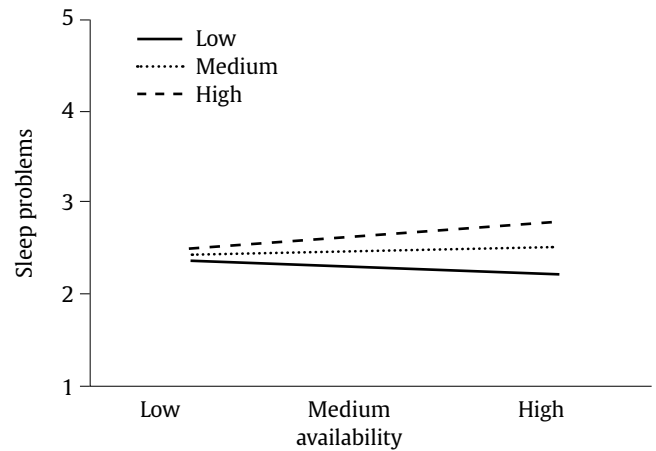


Figure 2. Simple Slopes for the Effect of WREA on Sleep Problems on Different Stages of the Moderator Segmentation Preferences.

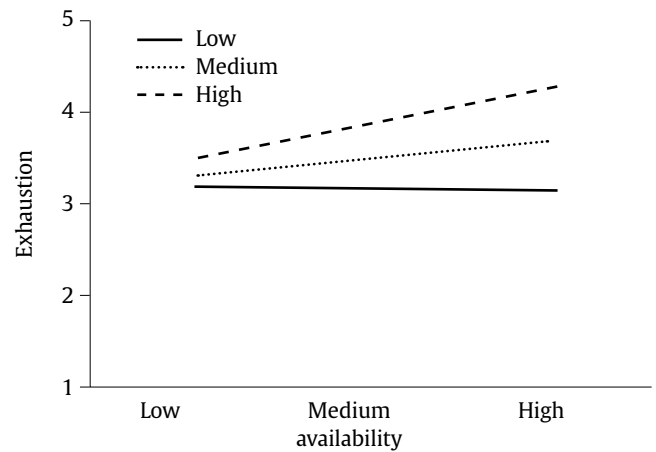


Figure 3. Simple Slopes for the Effect of WREA on Emotional Exhaustion on Different Stages of the Moderator Segmentation Preferences.

Hypothesis 3a: We assumed that the relationship between WREA and psychological detachment from work would be moderated by segmentation preferences such that people with stronger segmentation preferences have more problems detaching from work. The overall regression model (Table 4) was significant ($p < .001$) and explained 16% of the total variance. The interaction term, however, was non-significant ($b = -0.009 [0.02, 0.00], p = .11$).

Hypothesis 3b: The hypothesis posited that the relationship between WREA and sleep problems is moderated by segmentation preferences such that people with stronger segmentation preferences have more sleep problems. The regression model (Table 4) was significant ($p < .01$) and explained 8% of the variance. The interaction effect was also significant ($b = 0.010 [0.00, 0.02], p < .05$), so the effects on different stages of the moderator differed, although the effect was not different from zero on any of the slopes (low $b = -0.01 [-0.02, 0.01], p = .25$; medium $b = 0.00 [0.01, 0.02], p = .62$; high $b = .02 [-.01, .04], p = .18$).

Hypothesis 3c: Hypothesis 3c stated that the relationship between WREA and emotional exhaustion is moderated by segmentation preferences such that people with stronger preferences are more exhausted. The regression model (Table 4) was significant ($p < .001$) and explained 14% of the variance. The interaction was also significant ($b = 0.021 [0.01, 0.04], p < .01$). When looking at the conditional effects, the effect is significant for those with average ($b =$

0.020 [0.00, 0.04], $p < .05$) or stronger segmentation preferences ($b = 0.043$ [0.01, 0.07], $p < .01$), but not for people with lower segmentation preferences ($b = -0.002$ [-0.02, 0.02], $p = .79$).

Discussion

This study examined whether neuroticism and segmentation preferences moderate the impact of WREA on psychological detachment, sleep problems, and emotional exhaustion. While a greater extent of WREA was associated with less detachment from work (Hypothesis 1a), contrary to hypothesis 1b, it was not directly related to more sleep problems, nor was it directly associated with exhaustion (Hypothesis 1d). However, consistent with hypothesis 1c, we found WREA to be indirectly related to sleep problems via detachment. With regard to the hypothesized moderator effects, data did not support the assumption that neuroticism moderates the relationships of WREA with detachment (Hypothesis 2a) or sleep problems (Hypothesis 2b). Contrary to hypothesis 3a, the relationship between WREA and detachment was also not moderated by segmentation preferences. Nevertheless, we did find neuroticism to be a significant moderator in the association between WREA and exhaustion (Hypothesis 2c) and segmentation preferences to significantly moderate both the relationship between WREA and sleep problems as well as emotional exhaustion, confirming Hypotheses 3c and partially Hypothesis 3b).

Our results concerning detachment are largely in line with previous research. Almost all studies considering the relationship between work contact after hours (e.g., [Dettmers et al., 2016](#)) or work-related smartphone use (e.g., [Mellner, 2016](#)) and psychological detachment found negative associations. Contrary to our expectations, there was no moderator effect for either neuroticism or segmentation preferences. In both cases, the effect of WREA on detachment was significant and negative on all stages of the assumed moderator, indicating that the effect of WREA on detachment might be relatively stable among different individuals, although one should be careful with such conclusions, because there is a considerable number of potential interindividual differences and, thus, possible moderator variables.

Contrary to what we expected, there was no significant overall relationship between WREA and sleep problems, but we found an indirect effect via psychological detachment which is consistent with the idea that WREA negatively affects detachment from work and that this lack of detachment induces sleep problems. The reason we did not find an overall effect might be that we have a negative direct effect in our sample canceling out the indirect effect. This means that there may be other mechanisms involved that we do not know of. Another reason why the overall effect did not reach significance is the moderator effect of segmentation preferences suggesting that there are interindividual differences in the effect of WREA on sleep problems. Despite the significant interaction, none of the slopes was statistically different from zero. This can be explained by the fact that correlations on the different stages of the moderator go into different directions, causing the interaction effect, but on each stage associations are weak and our study does not have the power to reliably detect small effects. Although [Arlinghaus and Nachreiner \(2014\)](#) and [Bowen et al. \(2018\)](#) did find significant associations between work contact and sleep problems, the strength of relationships was weak. The interaction effect of neuroticism was not significant, which may be explained by the relatively strong association between neuroticism and sleep problems. It is possible that neuroticism itself has such a strong impact on sleep problems that a potential work stressor, such as accepting work contact in leisure time, does not make much of a difference.

Although we did not find an association of WREA with exhaustion in the overall sample, we found significant moderator effects

for neuroticism and segmentation preferences. Whereas individuals with higher scores in neuroticism or stronger segmentation preferences felt more exhausted when accepting work contact in leisure time, there was no relationship for people low in neuroticism or with low segmentation preferences. This finding could help explain why the effects of availability for work in leisure time on exhaustion previously found are inconsistent. Whereas most studies (e.g., [Derks, van Mierlo et al., 2014](#)) found a positive relationship, a few studies (e.g., [Collins et al., 2015](#)) found a negative one. The effect of WREA on exhaustion appears to be contingent on personal characteristics and attitudes and depending on the sample composition the effects found in a given sample can therefore vary.

Strengths and Limitations

The current study is the first to systematically investigate the role of personal attributes as moderators in the relationship between WREA and psychological detachment, sleep problems, and emotional exhaustion. Up until now, the role of interpersonal differences has been largely neglected in this field of research. Furthermore, the sample is not restricted to a single occupational group, but includes participants from a wide range of occupations. Finally, since it is possible that it is not availability for work itself that is problematic, but overtime alone, we controlled for it and can therefore exclude this alternative explanation.

However, there are also limitations. The study design is correlational, hence no causal conclusions can be drawn, and predictor, criterion, and moderator variables were assessed in one session, so it cannot be ruled out that part of the relationships between variables is due to common method variance. While this is possible, we do not consider this explanation likely, since bivariate relationships between WREA on the one hand and sleep problems and emotional exhaustion on the other are very low. Furthermore, the association between WREA and detachment is close to the meta-analytic estimate for the relationship between work-related activities during leisure time and detachment ([Wensche & Lohmann-Haislah, 2017](#)).

Directions for Future Research

Work and organizational research is often solely focused on the impact of working conditions and neglects that employees are individuals and one and the same condition might have different effects on different people. In only considering overall effects and ignoring interindividual differences, hidden moderators might obfuscate that availability for work might still be detrimental to some individuals even if there might be no or only small overall effects. Therefore, studies investigating the impact of work contact on employee health and work-life balance should take possible moderating effects of personality variables, attitudes, and preferences into account. It is, for instance, likely that there are other personal attributes or configurations of personality traits that moderate relationships between WREA and outcome variables. With regard to internal validity, studies should be conducted as longitudinal studies or at least predictor and criterion variables should be gathered in different sessions. Last, but not least, it could be interesting to directly compare different kinds of occupations with each other. We did have employees from many occupational groups, but due to the relatively small sample size, it would not have been statistically meaningful to make comparisons on this restricted empirical basis. Future research could compare occupational groups on the basis of bigger samples and make reliable statements about the extent and quality of WREA in different professions.

Implications and Conclusion

With this study we could provide evidence that consequences from WREA might not be the same for all employees. There are important implications to be drawn from our investigation. First, the existence of interindividual differences suggests that the average relationships reported in published studies might underestimate the actual negative impact of availability on certain individuals. Ignoring interindividual differences in research will prevent the emergence of a more differentiated knowledge of the effects of WREA on health outcomes, which could endanger the physical health and psychological well-being of individuals at risk. Second, although we found moderator effects for the two more distal outcomes sleep problems and emotional exhaustion, we did not find any significant interindividual differences for the relation of WREA with detachment suggesting that this association might be relatively stable across individuals. This indicates that problems detaching from work as an immediate effect of WREA might be generalizable, whereas only certain individuals are also affected by more distal outcomes. Third, the results suggest that employees who prefer to separate work and private life should be taken seriously in their needs and not be forced either implicitly or explicitly to stay connected to work in their leisure time, because it is they who seem to suffer the most adverse consequences. Of course, this should not mean that other employees should be contacted instead. The best avenue to go would be to reduce WREA amongst all employees as far as possible, by defining clear rules when contacting employees/colleagues in work-related situations is permissible and these situations should be rare exceptions. Fourth, our investigation is a first step in identifying groups at risk of suffering negative consequences from WREA. Generating empirical knowledge about which personal attributes might increase the risk for adverse consequences from WREA can help practitioners identify employees who might profit from interventions. Last but not least, we hope that our study can help create an awareness in supervisors and workers with a preference for integrating work and private life that – even if certain availability practices might not be harmful to themselves – they might harm colleagues and coworkers.

Conflict of Interest

The authors of this article declare no conflict of interest.

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