



When Thoughts Have No Off Switch: The Cost of Telepressure and Message-based Communication behaviour within Boundary-crossing Contexts

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Abstract

Communication technology enables employees to be constantly connected at the cost of potentially blurring the boundaries between work and private life, which can be detrimental to their well-being. The present study utilised a quantitative diary approach ($N=269$ employees, $N=1256$ data points) to provide further evidence on the association between telepressure and ruminative thoughts within boundary-crossing contexts (i.e., including work-related behaviour and cognitions during leisure time as well as private-related behaviour and cognitions at work). On a day-to-day level, we examined if context-incongruent telepressure had a positive effect on context-incongruent affective rumination through context-incongruent message-based communication behaviour. Multilevel analyses supported our hypothesised mediation models. Altogether, findings reveal that quickly replying towards messages or its related cognition (i.e., telepressure) may result in a resource-draining experience in terms of affective rumination within both boundary-crossing contexts. Theoretical and practical implications as well as future research avenues are discussed.

Keywords Affective rumination · Boundary-crossing · Context-incongruency · Diary study · Message-based communication behaviour · Telepressure

Communication technology such as the laptop or smartphone enables us to keep work and private life information at our fingertips, reinforcing blurred boundaries between work and private life (Colbert et al., 2016; Demerouti et al., 2014). In particular, an employee could quickly check incoming business emails during leisure time or unnoticedly chat with their family and friends at work. Although this message-based communication behaviour within boundary-crossing contexts may typically be assumed

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harmless and innocent, it can come at a cost to well-being and accordingly introduce new challenges for employees and their employing organisations (e.g., Derks et al., 2021; Schlachter et al., 2018).

Prior studies on context-incongruent behaviour have repeatedly shown that employees struggle to psychologically detach from work when they are still responsive towards incoming work messages during leisure time, which interferes with crucial resource recovering activities (Derks et al., 2014; Schlachter et al., 2018; Van Laethem et al., 2018). Not only the actual communication outside regular work hours, but even the preoccupation and urge to send those replies in a quick manner (i.e., workplace telepressure) unfolds into indicators of ruminative thinking about work such as reduced psychological detachment (Barber et al., 2019; Cambier et al., 2019; Hu et al., 2019; Pfaffinger et al., 2020; Santuzzi & Barber, 2018). Up till now, these associations have been studied exclusively in a single boundary-crossing context. Hence, it is unclear to what extent boundary-crossing contexts are similar in their effects on resource gains and losses.

Therefore, the present study aimed to shed light on the cost of telepressure and message-based communication behaviour within both boundary-crossing contexts (i.e., work-related behaviour and cognitions during leisure time as well as private-related behaviour and cognitions at work) in terms of affective rumination, a resource-draining facet of ruminative thinking (Cropley et al., 2012; Weigelt et al., 2019). By taking conservation of resources (COR; Hobfoll 1989) and boundary management (Ashforth et al., 2000; Clark, 2000) perspectives as a conceptual starting point, this quantitative diary study examines on a day-to-day basis how message-based communication behaviour exerts a mediating role between telepressure and affective rumination. Specifically, we hypothesised that employees who experience higher context-incongruent telepressure perform more context-incongruent message-based communication behaviour and, consequently, have more context-incongruent ruminative thoughts within the same day.

We aim to make at least two contributions to the literature. First, we provide further insight into occupational health research on context-incongruent technology use by focusing on both boundary-crossing contexts in one study design. The existing literature in this field has been dominated by research aimed at the detrimental effects of business communication beyond regular work hours, whereas the impact of communication behaviour towards private messages at work on employee well-being remains underexplored (Derks et al., 2021). Considering the prevalence of employees' technology use, this imbalance between studied boundary-crossing contexts is rather remarkable as employees seem to use their smartphones more often for private-related purposes at work than the other way around (Dora et al., 2019).

Second, we especially expand knowledge on ruminative thoughts by investigating its lesser investigated facet, namely affective rumination. Cropley et al., (2012) identified three empirically distinct facets of ruminative thinking about work: problem-solving pondering, affective rumination, and psychological detachment. In general, the scope of occupational health research is mainly confined to the latter facet. Likewise, studies on telepressure exclusively measured psychological detachment when investigating rumination (Barber et al., 2019; Cambier et al., 2019; Hu et al., 2019; Pfaffinger et al., 2020; Santuzzi & Barber, 2018). Consequently, the impact of tele-

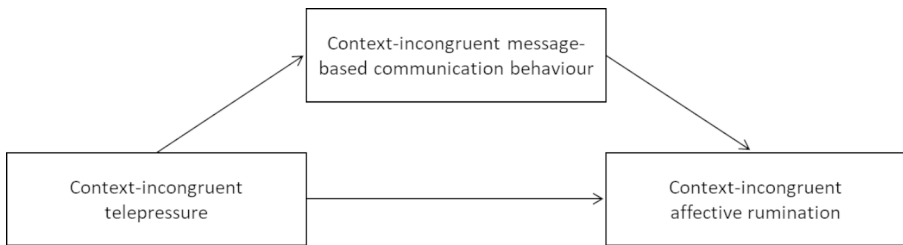


Fig. 1 Conceptual Model

pressure on psychological detachment is well understood while other facets of ruminative thoughts are to this date still being neglected. As we study how message-based communication behaviour exerts a mediating role between telepressure and affective rumination, the present study also adds to the sparse and warranted research on mediating mechanisms that help explain how telepressure relates to rumination (Cambier et al., 2019). Figure 1 visualises the conceptual model of this study.

COR Theory in a Boundary-crossing Context

Conceptually, resource depletion of context-incongruent behaviour can be understood by integrating conservation of resources (COR; Hobfoll 1989) and boundary management (Ashforth et al., 2000; Clark, 2000) perspectives. Depending on the permeability of employees' boundaries, work and private life can reside as separate or intertwined entities (Ashforth et al., 2000; Clark, 2000). When boundaries are blurred, context-incongruent behaviour is most likely to arise from both directions: work-related behaviour during leisure time (e.g., checking business emails in the bedroom) and private-related behaviour at work (e.g., chatting with family and friends while having a conference call). Typically, these are considered to impair well-being outcomes as boundary-crossing involves several cognitive, affective and self-regulatory costs (Puranik et al., 2019). Drawing on the COR theory (Hobfoll, 1989), the cost functions of boundary-crossing can be captured as a resource-depleting experience. This theoretical framework postulates the interplay of resource gains and losses as a core principle to determine how people cope with certain situations. When juggling multiple demands from work and private life, employees are challenged with context-incongruent demands while simultaneously dealing with ongoing context-congruent demands. Accordingly, the interrupting context will drain resources that could otherwise be investable in the interrupted context. The application of COR theory in a boundary-crossing context allows us to examine to what extent boundary-crossing contexts are similar in their effects on resource gains and losses.

Telepressure and Affective Rumination

Telepressure is a unique response to interpersonal social demands and encompasses the preoccupation and urge to quickly respond to message-based communication (Barber & Santuzzi, 2015). Despite its origin in occupational health psychology, telepressure has rapidly transformed into a more general responsiveness-related concept that can be experienced at any time throughout the day (Barber & Santuzzi, 2017), including boundary-crossing contexts such as workplace telepressure during leisure time (e.g., feeling the need to reply towards business emails in the bedroom; Cambier et al., 2019; Lutz et al., 2020; Van Laethem et al., 2018) and private life telepressure at work (e.g., feeling the need to reply towards chat messages of family and friends while having a conference call; Cambier et al., 2020; Lutz et al., 2020). Unfortunately, the pursuit of staying connected seems detrimental to well-being as employees who experience telepressure towards business communication struggle to psychologically detach from work during their leisure time (Barber et al., 2019; Cambier et al., 2019; Hu et al., 2019; Pfaffinger et al., 2020; Santuzzi & Barber, 2018).

A lack of psychological detachment implies work-related rumination (Cromptley et al., 2012; Weigelt et al., 2019). Yet, ruminative thoughts are not limited towards work issues in instances where the immediate situation does not require such thoughts, but can encompass any content or valence. Recent meta-analytic findings indicate that especially the valence of these repetitive thoughts determines the interplay of resource gains and losses (Wendsche & Lohmann-Haislah, 2017). Ruminative thoughts loaded with negative (e.g., ruminating about recent failures) rather than positive affectivity (e.g., ruminating about recent achievements) will deplete resources and shorten the time for resource recovery. Among the facets of ruminative thinking distinguished by Cromptley et al., (2012), affective rumination captures the intrusive thoughts that are experienced as affectively negative and, accordingly, is most suitable for inferring well-being impairment. As employees who experience telepressure, by definition, have a preoccupation with staying connected (Barber & Santuzzi, 2015), they will most likely be concerned about their responsiveness to incoming messages. In both incongruent contexts, we expect the following:

Hypothesis 1a Daily private life telepressure at work is positively related to daily affective rumination towards private issues at work.

Hypothesis 1b Daily workplace telepressure during leisure time is positively related to daily affective rumination towards work issues during leisure time.

The Mediating Role of Message-based Communication Behaviour

Message-based communication such as instant messaging platforms and email is most popular among communication technology for online interactions (Vandendriessche & De Marez, 2021). Message-based communication is perceived as convenient due to its potential time lag between the initial message and reply. Recipients may

respond immediately, postpone their reply, or even never respond at all. Situational factors such as inbox (e.g., quantity of unread messages) and message characteristics (e.g., sender) are known to influence recipients' responsiveness from day to day (Dabbish et al., 2005; Dogruel & Schnauber-Stockmann, 2020; Kalman & Ravid, 2015). However, responsiveness also seems to vary between recipients' motivation for connectivity. Studies that focused on business emails indicated that the experience of telepressure resulted in higher responsiveness, namely a decreased time lag between initial message and reply (Barber & Santuzzi, 2015) and an increased reply quantity (Cambier & Vlerick, 2020; Barber & Santuzzi, 2015; Grawitch et al., 2018). Thus, employees can postpone replies to incoming messages to a more appropriate moment, unless they experience telepressure and succumb to their urge to reply immediately. Accordingly, responses will be sent promptly, regardless of the ongoing activity (Barber & Santuzzi, 2015; Kalman & Ravid, 2015; Schlachter et al., 2018). In both incongruent contexts, we expect the following:

Hypothesis 2a Daily private life telepressure at work is positively related to daily communication behaviour towards private messages at work.

Hypothesis 2b Daily workplace telepressure during leisure time is positively related to daily communication behaviour towards work messages during leisure time.

Message-based communication was initially believed to be cold and impersonal (Rice & Love, 1987). Yet, a lack of social and non-verbal cues makes messages not less emotional nor more impersonal (Kafetsios et al., 2017). On the contrary, negative affect is as easily evoked and even expressed more intensely in message-based communication than in face-to-face interactions (Derks et al., 2008). Accordingly, the content of a received message may provoke or refresh repetitive affectively negative thoughts on the subject matter. In both incongruent contexts, we expect the following:

Hypothesis 3a Daily communication behaviour towards private messages at work is positively related to daily affective rumination towards private issues at work.

Hypothesis 3b Daily communication behaviour towards work messages during leisure time is positively related to daily affective rumination towards work issues during leisure time.

As mentioned above, we expect that higher levels of context-incongruent telepressure trigger a more frequent context-incongruent message-based communication behaviour (i.e., Hypothesis 2). Furthermore, we expect that this behaviour relates to an increase in context-incongruent affective rumination (i.e., Hypothesis 3). For example, employees may chat with their spouse about financial obligations during a conference call or reply towards a business email regarding tight deadlines while lying in bed, because they experience an irresistible need to respond to these incoming messages. Spontaneously, the content of this online interaction may pull them into a spiteful mental loop on the topic. Linking Hypothesis 2 with Hypothesis 3, we propose the following:

Hypothesis 4a Daily communication behaviour towards private messages at work mediates the indirect positive effect of daily private life telepressure at work on daily affective rumination towards private issues at work.

Hypothesis 4b Daily communication behaviour towards work messages during leisure time mediates the indirect positive effect of daily workplace life telepressure during leisure time on daily affective rumination towards work issues during leisure time.

Method

Sample and Procedure

By advertising our five-day diary study on social media, a convenience sample of employees was collected in Belgium. Respondents who met inclusion criteria were asked to send an email to one of the researchers. Participants were required to be (a) over 18 years old, (b) to regularly use message-based communication for both private and work purposes and (c) to not be on holiday or sick leave during the assessment days of the research. In response to their message, we provided necessary information such as the data collection process and participants' rights by means of email. Participants were free to decide whether to withdraw from the study at any time. A gift card worth €20 was offered as an incentive for participation to five randomly selected participants.

In total, participants were asked to fill out 11 online questionnaires over a brief period of time. Prior to the five consecutive assessment days, participants received a short questionnaire that assessed demographics. Next, participants received an automatic email at approximately 5:30 p.m. and 9:30 p.m. during each assessment day (i.e., Monday until Friday) which directed them to the daily questionnaires. The first daily questionnaire assessed private-related constructs at work (i.e., telepressure, message-based communication behaviour, and affective rumination) and was instructed to be completed at the end of their regular work hours. The second daily questionnaire assessed work-related constructs during leisure time (i.e., telepressure, message-based communication behaviour, and affective rumination) as well as general constructs during the whole day (i.e., stress and workload) and was instructed to be completed just before bedtime. This study was approved by the local institutional ethical review board.

Of the 398 respondents who initially participated, 269 responded in full to both daily questionnaires on at least four of five assessment days. More precisely, 180 participants (66.9%) completed all daily questionnaires and 89 participants (33.1%) completed the daily questionnaires on four assessment days, resulting in 1256 data points at the within-person level. Men (41.6%) and women (58.4%) were equitably represented in this sample of employees with diverse professional backgrounds. Most employees obtained a university degree (45.4%) or college degree (40.5%), whereas the minority of the sample owned a high school degree (14.1%) as the high-

est education level. Mean age and organisational tenure were respectively 36.3 years ($SD=11.91$) and 8.6 years ($SD=9.83$). The majority were full-time employed (84.7%) and possessed a company-issued communication technology device (74.9%). Due to the COVID-19 pandemic, employees were obliged to work remotely from home as a preventive measure against the virus. A stunning amount of employees (75.2%) did not work exclusively from home during the assessment days, either by choice or because they were unable to perform all their job tasks remotely.

Measures

Daily Context-incongruent Telepressure

Telepressure experienced within boundary-crossing contexts was assessed daily with the six-item Workplace Telepressure Measure (WTM; Barber & Santuzzi 2015). The specific context was embedded in the instructions and items. This resulted in a semantically mirrored item pool of six items for each boundary-crossing context (i.e., workplace telepressure during leisure time and private life telepressure at work). Accordingly, the measurement consists of 12 items in total. Depending on the context, example items read: ‘Today during leisure time, it was difficult for me to resist responding right away to a work message from someone related to work’ or ‘Today at work, it was difficult for me to resist responding right away to a personal message from my spouse / family / friend’. All items were rated on a five-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). Similar reliability coefficients were found in both contexts. Cronbach’s α of the scale assessing workplace telepressure during leisure time varied between 0.93 and 0.96, with an average of 0.95 across all assessment days. Likewise, Cronbach’s α of the scale assessing private life telepressure at work varied between 0.90 and 0.95, with an average of 0.93 across all assessment days.

Daily Context-incongruent Message-Based Communication Behaviour

Message-based communication behaviour executed within boundary-crossing contexts was assessed daily with two self-developed items inspired by Dora et al., (2019). These items measured how often participants sent messages and checked incoming messages, regardless of communication technology. The specific context was embedded in the instructions and items. This resulted in a semantically mirrored item pool of two items for each boundary-crossing context (i.e., communication behaviour towards work messages during leisure time and communication behaviour towards private messages at work). Accordingly, the measurement consists of four items in total. Depending on the context, example items read: ‘How often did you send personal messages at work today to communicate with your spouse / family / friend?’ or ‘How often did you send work messages during leisure time today to communicate with someone related to work?’. In line with previous work on self-reported technology frequency (Dora et al., 2019), all items were rated on a six-point Likert scale ranging from 1 (*never*) to 6 (*every few minutes*). Similar reliability coefficients

were found in both contexts. Cronbach's α of the scale assessing communication behaviour towards work messages during leisure time varied between 0.63 and 0.71, with an average of 0.66 across all assessment days. Likewise, Cronbach's α of the scale assessing communication behaviour towards private messages at work varied between 0.65 and 0.74, with an average of 0.71 across all assessment days.

Daily Context-incongruent Affective Rumination

Affective rumination experienced within boundary-crossing contexts was assessed daily with the five-item affective rumination subscale of the Work-Related Rumination Questionnaire (WRRQ; Cropley et al., 2012). The specific context was embedded in the instructions and items. This resulted in a semantically mirrored item pool of five items for each boundary-crossing context (i.e., affective rumination towards work issues during leisure time and affective rumination towards private issues at work). Accordingly, the measurement consists of 10 items in total. Depending on the context, example items read: 'Today during leisure time, I was troubled by work-related issues' or 'Today at work, I was troubled by private issues'. All items were rated on a five-point Likert scale ranging from 1 (*never*) to 5 (*always*). Similar reliability coefficients were found in both contexts. Cronbach's α of the scale assessing affective rumination towards work issues during leisure time varied between .93 and .96, with an average of .94 across all assessment days. Likewise, Cronbach's α of the scale assessing affective rumination towards private issues at work varied between .93 and .96, with an average of .95 across all assessment days.

Daily Stress

Stress was included as a control variable to avoid potential confounding effects on our outcome variables. High stress that originates from home or work responsibilities is potentially related to a higher tendency of ruminative thoughts (Sonnentag & Braun, 2013). It was assessed daily with the four-item version of the Perceived Stress Scale (PSS; Cohen et al., 1983). As items did not specify context, daily stress was captured regardless of its source. Example items read: 'Today, how often have you felt difficulties were piling up so high that you could not overcome them?' and 'Today, how often have you felt that things were going your way?' (reversed item). All items were rated on a five-point Likert scale ranging from 1 (*never*) to 5 (*always*). Cronbach's α of the scale varied between 0.65 and 0.71, with an average of 0.67 across all assessment days.

Daily Workload

Workload was included as a control variable to avoid potential confounding effects on our outcome variables. High workload that originates from home or work responsibilities is potentially related to a higher tendency of ruminative thoughts (Sonntag & Braun, 2013). It was assessed daily with three items developed by Bakker et al., (2003). As items did not specify context, daily workload was captured regardless of its source. Example items read: 'Today, I had to work extra hard to finish things'

and ‘Today, I had too much work to do’. All items were rated on a five-point Likert scale ranging from 1 (*never*) to 5 (*always*). Cronbach’s α of the scale varied between .87 and .93, with an average of .91 across all assessment days.

Strategy of Analysis

As our diary study included five repeated measurements (Level 1; $N=1256$ data points) nested within persons (Level 2; $N=269$ participants), linear mixed-effects (LME) regression models were fitted to the data using the lme4 package in R (Bates et al., 2015). In accordance with the recommendations by Aguinis et al., (2013), day-level predictors were centered at the perspective person mean. Although we hypothesised similar relationships among boundary-crossing contexts, separate analyses were conducted for private-related constructs at work and work-related constructs during leisure time instead of colliding these together into the LME regression models. This approach made it possible to determine whether proposed relationships hold across contexts. As our proposed control variables (i.e., daily stress and daily workload) were theoretically relevant (Sonnentag & Braun, 2013) and statistically significantly related to the outcome variables, they were added as control variables to the LME regression models to test our mediation hypotheses. The Sobel test (Sobel, 1982) was used to evaluate the indirect effects, which were indicated by the index of mediation (ab_{cs} ; Preacher & Hayes 2008) and the ratio of the indirect to direct effect (R_M ; Sobel 1982). Results were considered statistically significant at $p < .05$.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics and correlations among study variables. Intra-class correlations (ICC1) indicated that vast proportions of the variance in our daily measures were attributable to within-person differences (i.e., from 36 to 61%). Thus, day-level variables showed sufficient variability at the between and within levels of analysis, which justifies our multilevel approach.

Hypotheses Testing

Results of LME regression models with daily context-incongruent affective rumination as outcome variable were split into two analyses to evaluate models of private-related constructs at work (see Table 2) and models of work-related constructs during leisure time (see Table 3) separately. In both analyses, we compared three models: Model 1 which only included the control variables (i.e., daily stress and workload), Model 2 in which daily context-incongruent telepressure was added, and Model 3 in which we further added daily context-incongruent message-based communication behaviour. Model 2 showed a significant improvement in explained variance

Table 1 Descriptive Statistics and Correlations among Study Variables

	<i>M</i>	<i>SD</i>	<i>ICC</i>	1.	2.	3.	4.	5.	6.	7.	8.
1. Stress	2.11	0.71	0.50		0.16 ^{***}	0.04	0.10 ^{***}	0.10 ^{***}	0.10 ^{***}	0.15 ^{***}	0.26 ^{***}
2. Workload	3.02	1.16	0.61	0.32 ^{***}		-0.01	0.10 ^{***}	-0.09 ^{**}	0.10 ^{***}	0.03	0.23 ^{***}
3. Private life telepressure at work	2.47	1.13	0.49	0.39 ^{***}	0.07		0.09 ^{**}	0.32 ^{***}	0.02	0.30 ^{***}	0.03
4. Workplace telepressure during leisure time	2.41	1.19	0.54	0.40 ^{***}	0.27 ^{***}	0.49 ^{***}		0.07 [*]	0.38 ^{***}	0.11 ^{***}	0.37 ^{***}
5. Communication behaviour towards private messages at work	3.21	0.99	0.36	0.20 ^{***}	-0.04	0.47 ^{***}	0.17 ^{**}		0.11 ^{***}	0.17 ^{***}	0.03
6. Communication behaviour towards work messages during leisure time	2.91	1.12	0.42	0.25 ^{***}	0.16 ^{**}	0.27 ^{***}	0.47 ^{***}	0.60 ^{***}		0.06 [*]	0.24 ^{***}
7. Affective rumination towards private issues at work	1.78	1.00	0.48	0.58 ^{***}	0.18 ^{**}	0.57 ^{***}	0.45 ^{***}	0.24 ^{***}	0.24 ^{***}		0.16 ^{***}
8. Affective rumination towards work issues during leisure time	2.06	1.10	0.48	0.62 ^{***}	0.39 ^{***}	0.44 ^{***}	0.70 ^{***}	0.14 [*]	0.32 ^{***}	0.59 ^{***}	

Note. *M*=mean, *SD*=standard deviation, *ICC*=intra-class correlation. Correlations below the diagonal represent between-person correlations (*N*=269) and correlations above represent within-person correlations (*N*=1256). Respectively, these were derived from the computed mean scores for each participant across assessment days and from the person-mean centered variables

* *p*<.05. ** *p*<.01. *** *p*<.001

over Model 1 in both analyses (Table 2: $\Delta-2x\log=89.96$, $df=1$, $p<.001$; Table 3: $\Delta-2x\log=127.96$, $df=1$, $p<.001$). As expected, results suggested that employees have a stronger tendency to ruminate about private issues at work on days when they experience more private life telepressure at work ($\gamma=0.26$, $SE=0.03$, $t=9.68$, $p<.001$). Likewise, we have found that employees have a stronger tendency to ruminate about work issues during leisure time on days when they experience more workplace telepressure during leisure time ($\gamma=0.29$, $SE=0.02$, $t=11.67$, $p<.001$). Thus, Hypothesis 1a and Hypothesis 1b are supported.

Next, Model 3 showed a significant improvement in explained variance over Model 2 in both analyses (Table 2: $\Delta-2x\log=5.08$, $df=1$, $p=.02$; Table 3: $\Delta-2x\log=7.89$, $df=1$, $p=.005$). As expected, results suggested that employees who perform more communication behaviour towards private messages at work have a stronger tendency to ruminate about private issues at work within the same day ($\gamma=0.08$, $SE=0.04$, $t=2.25$, $p=.02$). Likewise, we have found that employees who perform more communication behaviour towards work messages during leisure time have a stronger tendency to ruminate about work issues during leisure time within the same day ($\gamma=0.09$, $SE=0.03$, $t=2.82$, $p=.005$). Thus, Hypothesis 3a and Hypothesis 3b are supported.

In a similar manner, results of LME regression models with daily context-incongruent message-based communication behaviour as outcome variable were split into two analyses to evaluate models of private-related constructs at work (see Table 4) and models of work-related constructs during leisure time (see Table 5) separately. In both analyses, we compared two models: Model 1 which only included the control variables (i.e., daily stress and workload) and Model 2 in which daily context-incongruent telepressure was added. Model 2 showed a significant improvement in explained variance over Model 1 in both analyses (Table 4: $\Delta-2x\log=101.77$, $df=1$, $p<.001$; Table 5: $\Delta-2x\log=148.91$, $df=1$, $p<.001$). As expected, results suggested that employees perform more communication behaviour towards private messages at work on days when they experience more private life telepressure at work ($\gamma=0.23$, $SE=0.02$, $t=2.38$, $p<.001$). Likewise, we have found that employees perform more communication behaviour towards work messages during leisure time on days when they experience more private life telepressure during leisure time ($\gamma=0.31$, $SE=0.02$, $t=2.38$, $p<.001$). Thus, Hypothesis 2a and Hypothesis 2b are supported.

Lastly, we tested whether context-incongruent message-based communication behaviour actually mediates the relation between context-incongruent telepressure and context-incongruent affective rumination on a day-to-day basis. As our results above were in line with the proposed hypotheses, we performed a Sobel test to evaluate the indirect effect in each context. Results supported our mediation hypotheses (i.e., Hypothesis 4a and Hypothesis 4b) for the analyses of private-related constructs at work (indirect effect: $\gamma=0.02$, $SE=0.01$, $z=1.97$, $p=.04$) and work-related constructs during leisure time (indirect effect: $\gamma=0.03$, $SE=0.01$, $z=2.95$, $p=.003$). Respectively, the index of mediation was 0.02 and 0.03, whereas the ratio of the indirect effect to the direct effect was 0.08 and 0.12. This implies that approximately one-tenth of the effect of context-incongruent telepressure on context-incongruent affective rumination is mediated through context-incongruent message-based communication behaviour.

Table 2 Multilevel Estimates of Models Predicting Daily Affective Rumination towards Private Issues at Work

	Model 1		Model 2		Model 3	
	Est	SE	Est	SE	Est	SE
Intercept	1.78***	0.05	1.78***	0.05	1.78***	0.05
Stress	0.20***	0.04	0.19***	0.04	0.18***	0.04
Workload	0.01	0.02	0.01	0.02	0.02	0.02
Private life telepressure at work			0.26***	0.03	0.24***	0.03
Communication behaviour towards private messages at work					0.08*	0.04
Variance level 2 (employee)	0.53	0.04	0.54	0.04	0.54	0.04
Variance level 1 (day)	0.47	0.02	0.43	0.02	0.43	0.02
-2 Log likelihood	3115.68		3025.72		3020.64	

Note. $N=269$ individuals, $N=1256$ data points. Est=Estimate (γ), SE=standard error

* $p < .05$. *** $p < .001$

Table 3 Multilevel Estimates of Models Predicting Daily Affective Rumination towards Work Issues during Leisure Time

	Model 1		Model 2		Model 3	
	Est	SE	Est	SE	Est	SE
Intercept	2.06***	0.05	2.06***	0.05	2.06***	0.05
Stress	0.34***	0.05	0.30***	0.04	0.29***	0.04
Workload	0.16***	0.03	0.14***	0.02	0.14***	0.02
Workplace telepressure during leisure time			0.29***	0.02	0.26***	0.03
Communication behaviour towards work messages during leisure time					0.09**	0.03
Variance level 2 (employee)	0.64	0.05	0.66	0.05	0.66	0.05
Variance level 1 (day)	0.52	0.02	0.46	0.02	0.45	0.02
-2 Log likelihood	3259.75		3131.79		3123.84	

Note. $N=269$ individuals, $N=1256$ data points. Est=Estimate (γ), SE=standard error

** $p < .01$. *** $p < .001$

Table 4 Multilevel Estimates of Models Predicting Daily Communication Behaviour towards Private Messages at Work

	Model 1		Model 2	
	Est	SE	Est	SE
Intercept	3.21***	0.05	3.21***	0.05
Stress	0.14***	0.04	0.13***	0.04
Workload	-0.07***	0.02	-0.06***	0.02
Private life telepressure at work			0.23***	0.02
Variance level 2 (employee)	0.64	0.05	0.64	0.05
Variance level 1 (day)	0.35	0.02	0.31	0.02
-2 Log likelihood	2840.15		2738.38	

Note. $N=269$ individuals, $N=1256$ data points. Est=Estimate (γ), SE=standard error

*** $p < .001$

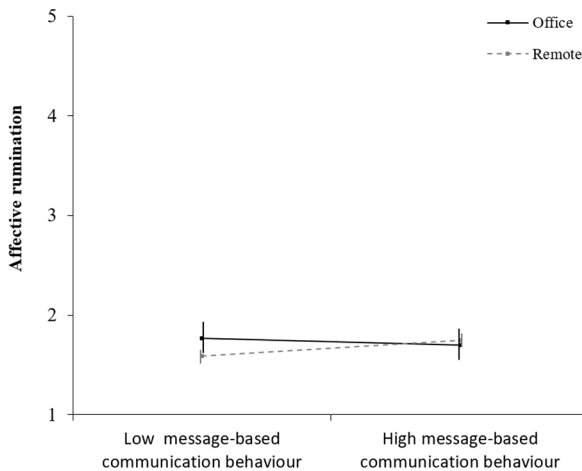
Exploratory Analyses

Table 5 Multilevel Estimates of Models Predicting Daily Communication Behaviour towards Work Messages during Leisure Time

	Model 1		Model 2	
	Est	SE	Est	SE
Intercept	2.90 ^{***}	0.06	2.90 ^{***}	0.06
Stress	0.13 ^{**}	0.05	0.09	0.04
Workload	0.07 ^{**}	0.03	0.05 [*]	0.06
Workplace telepressure during leisure time			0.31 ^{***}	0.02
Variance level 2 (employee)	0.72	0.05	0.74	0.05
Variance level 1 (day)	0.53	0.02	0.45	0.02
-2 Log likelihood	3296.07		3147.16	

Note. $N=269$ individuals, $N=1256$ data points. Est=Estimate (γ), SE=standard error.

* $p<.05$. ** $p<.01$. *** $p<.001$.



Note. Low and high message-based communication behaviour were respectively operationalized as one standard deviation below and above the mean. Vertical lines represent the 95% confidence intervals.

Fig. 2 Interaction Effect of Telework and Daily Message-based Communication Behaviour Towards Private Messages at Work on Daily Affective Rumination towards Private Issues at Work

Because data collection occurred during the COVID-19 pandemic, a vast amount of participants were obliged to work remotely from home as a preventive measure against the virus. Exploratory analyses were conducted to test the potential impact of this preventative measure on our proposed hypotheses. Accordingly, six additional regression analyses tested whether the relationships formulated in Hypothesis 1 to Hypothesis 3 were moderated by telework (i.e., office vs. remote). A moderation effect of telework was only found in the relationship between daily communication behaviour towards private messages at work and daily affective rumination towards private issues at work ($\gamma=0.22$, $SE=0.09$, $t=2.35$, $p=.02$). Follow-up simple slope tests were conducted to examine the interaction pattern in more detail (see Fig. 2).

Results revealed that the positive relationship between communication behaviour towards private messages at work and affective rumination about private issues at work (i.e., Hypothesis 3a) only holds when working remotely from home ($\gamma=0.18$, $SE=0.06$, $t=2.59$, $p=.01$), but not when working at the office ($\gamma=-0.08$, $SE=0.07$, $t=-1.13$, $p=.26$). On a related note, we also found that employees perform more communication behaviour towards private messages when working remotely from home than when at the office ($\gamma=0.20$, $SE=0.07$, $t=2.90$, $p=.004$).

Discussion

Crucial resource recovery activities get interrupted when employees are still responsive towards incoming work messages during leisure time (Derks et al., 2014; Schlachter et al., 2018; Van Laethem et al., 2018) or when they experience the pre-occupation and urge to send those replies in a quick manner (Barber et al., 2019; Cambier et al., 2019; Grawitch et al., 2018; Hu et al., 2019; Pfaffinger et al., 2020; Santuzzi & Barber, 2018). Since it remains unclear whether private-related behaviour and cognitions at work have a similar effect on resource gains and losses, the present study investigated the potential cost of telepressure and message-based communication behaviour within both boundary-crossing contexts in terms of affective rumination, a resource-draining facet of ruminative thinking (Cropley et al., 2012; Weigelt et al., 2019).

Overall, the results of the present quantitative diary study convincingly showed that context-incongruent telepressure is positively related to affective rumination, at day-level, in both a direct and indirect manner through context-incongruent message-based communication behaviour. The direct effect is consistent with prior studies stating that workplace telepressure can evoke ruminative thoughts (Barber et al., 2019; Hu et al., 2019; Pfaffinger et al., 2020; Santuzzi & Barber, 2018), which deplete resources on itself and interfere with resource recovering activities (Wendsche & Lohmann-Haislah, 2017). Similarly, our findings indicate that the experience of private life telepressure at work seems equally harmful in terms of resource depletion. This supports recent findings suggesting that staying connected to private life matters at work has negative implications for employee well-being (Derks et al., 2021).

As expected, the hypothesised relation between telepressure and affective rumination within boundary-crossing contexts was indirectly related through daily context-incongruent message-based communication behaviour. In line with previous studies (Derks et al., 2008; Kafetsios et al., 2017), message-based communication can thus evoke negative affect in the recipient. The magnitude of this indirect effect was rather small, but consistent with the effects of technology use on well-being (Huang, 2017) or communication research in general (Rains et al., 2018). Although it may raise doubts on whether these effects are practically meaningful for employees' daily life, seemingly minor effects could accumulate over time and greatly influence relationships due to processes of accumulation (Abelson, 1985; Anvari et al., 2021).

The results also indicate that employees often engage in context-incongruent activities on their communication technology, which is likely facilitated by the flexibility in how, when, and where employees work nowadays (Demerouti et al., 2014). In

regard to the latter, an explanation for our findings on telework can perhaps be found in the blurred boundaries between work and private life. It is generally known that communication technology is associated with increased permeability of work-life boundaries (e.g., Derks et al., 2016; Schieman & Young, 2013). Telework is argued to further blur these boundaries due to spatial, temporal, and psychological overlap of work and family roles (Valcour & Hunter, 2005). Accordingly, it is feasible that only a relationship between daily communication behaviour towards private messages at work and daily affective rumination towards private issues at work was found when employees worked remotely from home, because work-life boundaries are then most permeable. Additionally, our results revealed an increased communication behaviour towards private messages when working remotely from home, which is in line with prior research suggesting that telework enhances the likelihood of counterproductive work behaviour such as cyberslacking, a phenomenon in which employees are distracted by personal technology use at work, as they are physically out of view of their supervisor or colleague (O'Neill et al., 2014).

Although the present study focused on a resource-depleting experience, we want to acknowledge that communication technology can also replenish resources. A paucity of research illustrated nuanced perspectives that take the dual nature of digital connectedness into account. As such, employees' connectivity can in some cases positively impact their well-being (Budnick et al., 2020; Roberts & David, 2020; Sonnentag et al., 2018) and work performance (Tandon et al., 2022). These paradoxical findings suggest that connectivity is not as straightforwardly harmful as primarily assumed in literature and indicate that exclusively addressing its drawbacks does not suffice for understanding the complex reality in this modern-day digital age.

Limitations and Future Directions

The presented results must be interpreted cautiously, owing to several methodological limitations. Most notable is the inability to infer causal statements since, per analysis, all entered variables were measured simultaneously. Future studies could assess variables at different points during the day so that the predictor and outcome variables are temporally separated.

In addition, our diary approach also does not allow us to infer statements beyond the day-level perspective. For instance, affective rumination during a few days will most likely result in temporary experiences at most and is therefore not as problematic as chronic experiences due to persistent resource depletion (Sonnentag et al., 2010). We recommend that future studies observe the cumulative resource loss over the course of months by using a longitudinal design with larger time intervals.

Although the diary approach is highly appropriate for tracing employees' activity in everyday life (Ohly et al., 2010), our study variables were exclusively self-reported. Therefore, method biases could not be ruled out (Podsakoff et al., 2003, 2012). However, we were primarily interested in intraindividual fluctuations over days, which eliminates the potential influence of response tendencies stemming from individual differences. Nonetheless, we adopted several strategies recommended by Podsakoff et al. (2012) to alleviate method bias concerns and improve the trust-

worthiness of our findings. As such, self-report measures that encompassed items in concise language were chosen to reduce lexical misunderstandings. Next, the online questionnaires were designed to show each measure on a separate page to minimise participants' tendency to use previous answers for subsequent items. Moreover, we emphasised the anonymity of responses to motivate participants further to provide accurate instead of socially desirable answers. Future studies could incorporate more objective measures, for example, the use of monitoring software on communication technology to provide a more valid estimate of message-based communication. As telepressure and affective rumination are internal experiences, self-report measures are likely the most suitable approach for these constructs.

Next, self-report measures of stress and message-based communication behaviour demonstrated reliability values that were less than optimal on several assessment days. Brief scales commonly have a lower Cronbach's α due to their sensitivity to item pool size (Pedhazur & Schmelkin, 1991). As reliable measures are crucial for minimising measurement error and bias, we recommend future studies to use more extensive measures while taking the total length of the questionnaire into account.

Lastly, it can be argued that an experience sampling design would even be more appropriate to test our hypotheses. Yet, we perceive our diary approach as a methodological strength due to its limited outgoing emails that request participants to fill in a questionnaire. Various requests on a single day may provoke our variables of interest (i.e., telepressure and message-based communication) and thereupon bias our results.

Theoretical and Practical Implications

The present study has several implications for theory and practice. Regarding its theoretical contributions, two implications to the literature become apparent. First, our results extend occupational health research on context-incongruent technology use by focussing on both boundary-crossing contexts in the same study design. This more comprehensive look adds to still scarce empirical evidence on the negative impact of communication behaviour towards private messages at work on employee well-being (Derks et al., 2021). Researchers should more often include the bidirectionality of context-incongruent message-based communication to test their simultaneous effects. Second, our results contribute to extending knowledge on affective rumination and broaden the understanding of ruminative thoughts. Earlier research in this field has concentrated chiefly on the relation between telepressure and psychological detachment (Barber et al., 2019; Cambier et al., 2019; Grawitch et al., 2018; Hu et al., 2019; Pfaffinger et al., 2020; Santuzzi & Barber, 2018). By assessing affective rumination, we provide empirical evidence on resource-draining experiences beyond a lack of psychological detachment. Likewise, we acknowledge the importance of message-based communication as mediator in this relation, which builds upon prior work on mediating mechanisms that help explain how telepressure relates to rumination (Cambier et al., 2019).

Our findings are also highly valuable in practice as communication technology such as the laptop or smartphone is omnipresent in employees' daily life. Although they might assume that quickly responding to a message in an incongruent context

is harmless and innocent, our results provide additional empirical evidence for the opposite. We believe that employees and their employing organisations have a shared responsibility in context-incongruent behaviour and cognitions. Following Potter et al., (2022), we recommend organisations to develop a guidance document stating principles about response expectations towards private and business communication to provide awareness and cultivate change among employees. Organisations will have to work out their own emphases on practices and policies in a tailor-made approach to optimally align employees' connectivity needs with their own, which can range from simply specifying response expectations in outgoing work messages (Giurge & Bohns, 2021) to more drastic measures such as implementing digital detox strategies for incoming messages into the organisational culture (Mirbabaie et al., 2022; Wijngaards et al., 2022). In particular, notifications of incoming work and private messages can respectively be blocked (partially) during leisure time and work hours.

Conclusion

Empirical research within occupational health literature postulates technological advancements as a double-edged sword which improves the quality of life while also introducing new challenges with the potential to impair well-being. Taking conservation of resources and boundary management perspectives as a conceptual starting point, the present study indicates that quickly replying towards messages as well as its related cognition (i.e., telepressure) have similar effects within both boundary-crossing contexts in terms of resource depletion. Overall, our findings warn us about the risks that constant connectedness may impose on employee well-being and strengthen prior recommendations to refrain from context-incongruent technology use at work and during leisure time.

Declarations

Conflict of Interest The authors have no relevant financial or non-financial interests to disclose and declare that no funds, grants, or other support were received during the preparation of this manuscript.

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