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Empirical Article

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Always on Call: Is There an Age Advantage in Dealing with Availability and Response Expectations?

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Abstract

This research challenges the technology-related age stereotype that older employees might be disadvantaged in dealing with work-related information communication technology (ICT) demands. Rather, we hypothesize an age advantage in this regard. Based on theorizing on aging at work, we suggest that older employees are better at psychologically detaching from work under high availability expectations and that they show more adaptive responsiveness to response expectations. We examined a potential age-related mechanism underlying this effect, namely internal workplace telepressure. We pursued a two-study approach. Study 1 examined data from 5,938 individuals who participated in a large-scale survey of employees in Germany just before the COVID-19 pandemic, testing age as moderator of the relationship between availability expectations and psychological detachment from work. Results supported the hypothesized age advantage effect showing that for older employees, availability expectations were less strongly related to impaired psychological detachment. Study 2, a diary study with 106 participants answering more than 500 daily surveys during the pandemic, supported lower telepressure as explanation for this age advantage effect. Study 2 further extended this finding to the relationship of response expectations with responsiveness, identifying both age and telepressure as predicted by age to moderate this relationship. This research shows age advantage effects in dealing with ICT demands, enhancing understanding of the intersection between age and technology use at work.

The rise in information communication technology (ICT) use for work (e.g., Hu et al., 2021; Wang et al., 2020) has increased the possibilities and related expectations to respond quickly to work tasks—especially to ICT messages that are expected to be answered immediately—and to be available for work after hours (Day et al., 2012). These developments have accelerated in the wake of the COVID-19 pandemic (Hu et al., 2021) and are likely to represent a defining feature of the post-pandemic workplace. High response and availability expectations in turn may unfavorably affect employees' work–life interface (e.g., Cho et al., 2020), their recovery from work stress (e.g., Barber & Santuzzi, 2015), and, thus, their health and well-being (Day et al., 2019). Although one could think that older employees are at a disadvantage in this regard, because they might struggle more to adapt to ICTs and related work demands than the "digital natives" (Bennett, 2012; Berg-Beckhoff et al., 2017), in this research we suggest that the contrary will be the case.

More specifically, given that self-management, resilience, and calmness in the face of high demands improve with age (Kooij et al., 2020; Scheibe, 2021; Scheibe & Zacher, 2013), older employees may have an advantage when having to deal with ICT-related work demands. Accordingly, we argue that older employees are better at controlling and adapting their behavioral and psychological reactions to ICT demands, that is, to technology-related external work events or organizational requirements that have the potential to create negative outcomes for the affected employees (Day et al., 2012; Hu, Park, et al., 2021). One important aspect of ICTs is that they allow employees to be always "on" and available (Braukmann et al., 2018). Accordingly, ICTs may pose specific demands unique to the digitized world of work (Hu, Barber, et al., 2021), such as availability and response expectations (Day et al., 2019). Availability expectations describe the demand for employees to be constantly accessible for work matters outside of working hours (Day et al., 2012) whereas response expectations reflect an obligation to quickly respond to ICT messages also during working hours (e.g., Grawitch et al., 2018).

In this research, we address the question of whether an age advantage in dealing with work-related availability and response expectations exists. Specifically, we hypothesize that older employees—compared to younger employees—are better at mentally switching off and not thinking about work after work (i.e., psychological detachment from work; Sonnentag & Fritz, 2015) when facing high availability expectations. Further, we expect that older employees will show more adaptive reactions to response expectations during working hours, namely more functional responsiveness (i.e., response time to ICT messages; Hu, Park, et al.,

2021; Sonnentag et al., 2018). Thus, we hypothesize that age affects (i.e., moderates) the relationship of availability expectations with psychological detachment from work as well as of response expectations with responsiveness. Figure 1 summarizes our research model.

Because age itself cannot provide a causal explanation (Kooij et al., 2013), we further examine a potential age-related psychological mechanism underlying this moderation effect: internal workplace telepressure (Grawitch et al., 2018). Workplace telepressure describes an individual's preoccupation and urge to quickly respond to ICT messages (Barber & Santuzzi, 2015). A high internal workplace telepressure reflects an individual's high negative attention to and appraisal of response and availability expectations (Santuzzi & Barber, 2018). In contrast, chronological age relates to less negative attention to and appraisal of demands and daily hassles (Scheibe & Zacher, 2013). Accordingly, based on theorizing and research on (successful) aging at work (e.g., Kooij et al., 2020; for a review see Zacher et al., 2021), we suggest that age will negatively predict internal workplace telepressure, and that lower telepressure will explain older employees' more adaptive reactions to response and availability expectations.

To test our hypotheses, we pursued a two-study approach. In Study 1, we investigated the moderating role of age in the relationship of availability expectations with psychological detachment from work based on a representative German national data set. In Study 2, we examined internal workplace telepressure—predicted by age—as an age-related moderator of the effects of availability expectations on psychological detachment from work as well as of the effect of response expectations on responsiveness based on data collected within a diary study (Gabriel et al., 2019).

In sum, the purpose of our research is to uncover a potential age advantage in dealing with technology-related work demands, precisely availability and response expectations. We contribute to the understanding of age differences in the attention to and appraisal of work-related ICT demands (i.e., internal workplace telepressure) and their role for work-related ICT use (i.e., responsiveness) and work-stress recovery (i.e., psychological detachment from work) in reaction to ICT demands. By adopting a positive view on the role of age (Scheibe & Zacher, 2013) in work-related technology use, our study has the potential to reveal age advantages in a context where negative age stereotypes toward older employees are prevalent (Berg-Beckhoff et al., 2017; Mariano et al., 2022). As such, with two complementary studies, we help enhance understanding of the intersection between age and technology. Specifically, integrating research on aging at work (Zacher et al., 2021), on work-related ICT use (Hu, Barber, et al., 2021), and on work-stress recovery (Sonnentag et al., 2022), we consider that age might bring personal advantages for employees to deal with ICT demands, helping their adaptive ICT use and successful recovery from work. Thereby, we contribute to work-stress recovery research, which, surprisingly, has not paid much attention to the role of age (Sonnentag et al., 2017).

Considering both work-related ICT demands that occur after working hours (i.e., availability expectations) and during working hours (i.e., response expectations), we provide a meaningful extension of current research on work-related ICT use that largely focuses on the effects of work-related ICT use outside normal working hours (Hu, Barber, et al., 2021). Our approach allows for a more realistic perspective on ICT use for work purposes that considers it a normal and necessary feature of modern work (Wajcman & Rose, 2011; Wang et al., 2020) and acknowledges its potential benefits for organizational effectiveness, for example, in relation to employees' performance (Diaz et al., 2012), while at the same time considering its risks, for example, in relation to exacerbated employees' stress (Day et al., 2019) and impaired work-stress recovery (Braukmann et al., 2018).

Availability Expectations and Psychological Detachment from Work: The Role of Age

In modern, often stressful, work life, employees' recovery (i.e., unwinding, unplugging, and resting from the demands of work; Sonnentag, 2018) is important to stay well, healthy, and productive (Sonnentag et al., 2022). This is basically true for employees of all age groups. There are several means that can help effective recovery from work stress, of which meta-analyses have identified psychological detachment from work, the psychological experience of being mentally switched off and not thinking about work when not at work (Sonnentag & Fritz, 2007), as one of the most important (Steed et al., 2021; Wendsche & Lohmann-Haislah, 2017).

Whereas recovery from work stress is especially important when job demands are high, for employees who face high demands it is particularly difficult to recover from work (Sonnentag, 2018). Regarding psychological detachment from work, the notion that recovery is impaired when

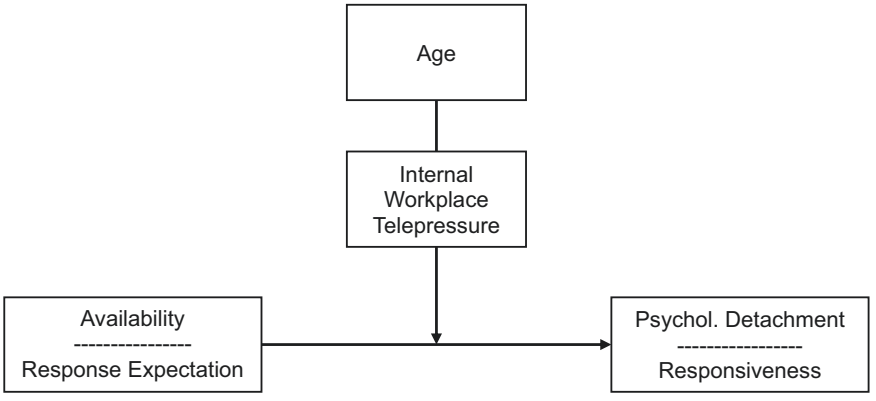

Figure 1. Overall research model.

demands are high is theoretically explicated in the stressor-detachment model (Sonnentag & Fritz, 2015). There is striking meta-analytic evidence that work-related demands are indeed negatively related to psychological detachment from work (Bennett et al., 2018), especially those demands that encroach upon employees' home domain (Wendsche & Lohmann-Haislah, 2017), such as availability expectations. More precisely, when employees feel the need to be available after working hours, this keeps their psycho-physiological stress systems activated which in turn impedes their psychological detachment from work (e.g., Brauner et al., 2021; Dettmers et al., 2016; Vieten et al., 2022).

However, external availability expectations might be less internally stressful for some employees than for others, meaning that availability expectations might hinder successful psychological detachment from work more strongly for some employees than for others. This could have to do with different perception and appraisal processes (Karabinski et al., 2021; Sonnentag & Fritz, 2015). This suggestion is in line with key theories of work stress, such as the transactional stress model (Lazarus & Folkman, 1984), which poses that the individual effect of any external demand is always the result of the interplay (i.e., transaction) between the situation and the person who encounters the situation. Specifically, the individual perception and evaluation (i.e., appraisal) of and the dealing (i.e., coping) with the external demand shape the person's reaction to the demand—with individual appraisal and coping processes, in turn, being dependent on certain person characteristics. For example, age might affect the stress process by shaping demand appraisals and coping behaviors (Rauschenbach et al., 2013). Indeed, older people are less negatively affected by different (work) demands (e.g., Mauno et al., 2013; Shirom et al., 2008; Stawski et al., 2019). Accordingly, we suggest that age moderates the relationship of availability demands with psychological detachment from work.

We base this assumption on theory and empirical research that suggests more favorable perceptions and evaluations of external demands as well as improved coping, self-management, and emotion-regulation competencies with age. Specifically, because efficient psychological detachment from work is closely related to demand appraisal (Karabinski et al., 2021; Sonnentag & Fritz, 2015) and coping and emotion regulation (Karabinski et al., 2021; Sonnentag & Fritz, 2007) and given that appraisal processes and coping and emotion regulation improve with age (Rauschenbach et al., 2013; Scheibe & Zacher, 2013), we expect that the ability to psychologically detach from work under high availability expectations depends on employees' age (Sonnentag et al., 2017). In other words, we expect the same "objective" availability expectations to be appraised and dealt with differently by older vs. younger employees due to age-related changes in stress processes (Rauschenbach et al., 2013). Based on these considerations, we suggest that older employees thus show more adaptive reactions to high availability demands, specifically better psychological detachment from work during nonwork hours. Indeed, there is some empirical evidence that older employees use more efficient work–life-boundary-management strategies (Spieler et al., 2018) and accordingly show better work-stress recovery (Winwood et al., 2006). Consequently, we hypothesize that older employees are better in dealing with availability expectations, meaning that high availability expectations will be less detrimental to their psychological detachment from work.

Hypothesis 1:

Age moderates the negative relationship between availability expectations and psychological detachment from work such that it is weaker in older employees.

Study 1

Study 1: Method

Sample and procedure

To test Hypothesis 1, we used data from a large-scale German data collection conducted from May 2019 until January 2020, the BAuA-Working Time Survey 2019 (Wöhrmann et al., 2020). More than 9,000 employees of all age and educational groups from across economic branches and jobs participated in computer-assisted telephone interviews conducted by professional interviewers of a social science research institute. Participants answered questions on a broad range of work- and well-being-related topics (for detailed information on the data collection, see Häring et al., 2020). For the present study, we used a subsample comprised of 5,938 dependently employed individuals aged 21–65 using ICT in their job, working during daytime, and working at least 20 hr per week. Only participants who indicated that they use ICT in their job were included. More than half of the participants were male (54%), received higher education (65%), and were aged 50 years or older (58%). Less than 10% were aged 30 or younger. Mean age of participants was 49.6 years (SD = 9.69). Mean organizational tenure was 15.5 years (SD = 11.3, range: 0–50). More than a third worked in public service (37%), followed by service industry (28%), manufacturing (23%), and craft (6%); 6% could not allocate themselves to one of these industries. Regarding occupational sectors, participants worked most often in business administration and other business-related services (39%), personal services (26%), and production (20%). The sample comprised of 82% salaried employees, 12% civil servants, and 6% hourly workers. Most participants had highly complex (38%) or complex (28%) jobs, 37% held a supervisory role. Most participants did not work from home (73%), 24% worked from home less than 5 days per week, and 3% worked from home at least 5 days per week.

Measures

Table 1 provides an overview of the descriptive statistics of and correlations between the variables used in the present study.

Availability expectations were assessed with one item ("My work environment expects me to be available for work-related matters in my private life"). Participants responded on a 5-point Likert scale ranging from *does not apply at all* (1) to *fully applies* (5). We grand-mean-centered the item to conduct moderation analysis. Availability expectations (answers 4 or 5 on the 5-point Likert scale) were slightly more common in men (24%) than in women (20%) and for those with higher education (24%). They did not differ substantially between age groups nor between industrial sectors. They were more common among civil servants (29%) than among salaried employees (21%) and hourly workers (20%), as well as among those with highly complex jobs (28%), those with a

supervisory role (28%), and those who worked from home (28%)—especially those who worked at least 5 days from home per week (33%).

Psychological detachment from work was measured with three items from a translated and adapted subscale of the work–family interference scale (Carlson & Frone, 2003). A sample item is "When I am at home, I often think about things I need to accomplish at work." Ratings were given on a 5-point Likert scale ranging from *does not apply at all* (1) to *fully applies* (5). Items were recoded resulting in higher values representing better psychological detachment from work. Cronbach's alpha was .80.

Age was operationalized as chronological age in years. We grand-mean centered the item to conduct moderation analysis. In an exploratory analysis, we included organizational tenure in years as a different conceptualization of age to rule out the possibility that a potential age advantage is rather due to the experience within the current organization (Bedeian et al., 1992) and a related more realistic evaluation of external expectations.

Control variables were gender, education, supervisory role, and weekly working hours. Results of analyses without the control variables did not meaningfully differ from those with control variables. Thus, for sake of conciseness, we report the results of the hypothesis test without control variables.

Study 1: Results

Descriptive analyses (Table 1) revealed a significant negative correlation between availability expectations and psychological detachment from work ($r = -.316$, $p < .001$). Age was unrelated to availability expectations ($r = -.014$, $p = .252$) as well as psychological detachment from work ($r = -.012$, $p = .353$). Organizational tenure was strongly related to age ($r = .508$, $p < .001$) but unrelated to both availability expectations ($r = -.003$, $p = .821$) and psychological detachment from work ($r = -.003$, $p = .820$).

Linear regression analyses conducted in SPSS revealed a negative main effect of availability expectations on psychological detachment from work ($\beta = -.316$, $p < .001$; $R^2 = .100$). The stepwise inclusion of age ($\beta = -.017$, $p = .169$; $R^2 = .000$) and the interaction term (availability expectations × age) in the model ($\beta = .055$, $p < .001$; $R^2 = .002$, $p < .001$) revealed that age indeed moderated the relationship between availability expectations and psychological detachment from work. When age and organizational tenure were included in the analysis simultaneously, only the interaction effect of age with availability expectations was significant (Table 2; $\beta = .045$, $p < .001$) but not the interaction effect of tenure with availability expectations ($\beta = .019$, $p = .177$). The negative relationship between availability expectations and psychological detachment from work was weaker in older employees than in younger employees. Comparing the simple slopes for younger ($\beta = -.389$, $p < .001$) and older employees ($\beta = -.265$, $p < .001$) using the common definition of older employees being aged 50 years or older supported this pattern [t (5, 923) = 5.044, $p < .001$). Thus, Hypothesis 1 could be confirmed.

Table 1. Descriptive statistics and intercorrelations of variables of Study 1.

Variable		*M*	*SD*	2	3	4
1	Employee age	49.60	9.69	.51**	−.02	−.01
2	Organizational tenure	15.49	11.73		−.00	−.00
3	Availability expectations	2.26	1.36			−.32**
4	Psychological detachment	3.42	1.01			

Note. $N = 5{,}919–5{,}938$.
*$p < .05$. **$p < .01$.

Study 1: Interim Discussion

The aim of Study 1 was to investigate whether age could represent a protective factor in the negative relationship between availability expectations and psychological detachment from work. To test this idea, we used a sample from a large-scale representative German employee survey. Findings support our hypothesis: For older employees, the expectation to be available for work during nonwork time was less strongly related to impaired psychological detachment from work. Thus, regarding the potential risks that constant availability as a feature of the digitized world of work bears, older employees might be at an advantage. Specifically, considering the stressor-detachment model (Sonnentag & Fritz, 2015), it seems that availability expectations are less of a "stressor" to older employees. As such, Study 1 gives reason to assume that an age advantage in the context of work-related ICT demands might exist—although the found effect was very small and thus can only be taken as an indication that there is a phenomenon that needs to be further investigated. Moreover, chronological age itself is not explanatory (e.g., Kooij et al., 2013), yet within the scope of Study 1, based on available data of the BAuA-Working Time Survey 2019, we were not able to investigate possible psychological explanations behind this potential age advantage effect. Also, Study 1 is restricted in the use of a single-item measure for availability expectations (although current research shows that constructs in the organizational sciences can often be assessed reliably and validly with a single item; Matthews et al., 2022). Hence, to overcome the limitations of Study 1 and to critically replicate and extend its findings, we planned and conducted Study 2.

As outlined, a reason for the hypothesized age advantage could be that older employees are better at coping and self-management and at realistically evaluating the external demands of their work, including their ICT demands. Thus, they might perceive availability expectations as less stressful, that is, feel less compelled to be accessible and respond to ICT messages outside working hours. This might explain

Table 2. Regression results for Hypothesis 1 (Study 1).

Outcome: Psychological detachment	Model 1: Age	Model 2: Tenure	Model 3: Age and tenure
Availability expectations	−.317**	−.316**	−.317**
Employee age	−.018		−.023
Organizational tenure		−.002	.009
Interaction terms			
Availability expectations × Age	.055**		.045*
Availability expectations × Tenure		.042**	.019

Note. $N = 5{,}923–5{,}933$. The table shows the standardized beta coefficients.
*$p < .01$. **$p < .001$.

why availability expectations are less detrimental regarding psychological detachment from work for older as compared to younger employees. Accordingly, we argue that an explanatory mechanism here could be that with increasing age employees feel less pressurized to be always available and respond quickly to ICT messages. The internally felt compulsion to check and respond to ICT messages describes a psychological construct known as internal workplace telepressure (Barber & Santuzzi, 2015; Grawitch et al., 2018).

In order to explore this idea, in Study 2, we investigate internal workplace telepressure—as predicted by chronological age—as an explanatory mechanism in the moderation of the relationship between availability expectations and psychological detachment from work. Furthermore, having focused on an ICT demand referring to outside regular working hours (i.e., availability expectations) in Study 1, in Study 2, we expand the examination to include an ICT demand relevant during working hours (i.e., response expectations; Day et al., 2012). We examine response expectations in relation to an at-work reaction (i.e., responsiveness; Sonnentag et al., 2018) to provide further evidence for an age advantage in dealing with work-related ICT demands.

In Study 2, we used a diary design, complementing the cross-sectional data of Study 1 with daily data, and analyzed the roles of ICT demands, age, and internal workplace telepressure in relation to aggregated daily ratings of psychological detachment from work and responsiveness. Such aggregated diary data represent more reliable measurements (Venz & Boettcher, 2022) given that reports from several days are combined and retrospective bias is reduced (Robinson & Clore, 2002; see Spieler et al., 2018, for a discussion of this issue in particular relation to studying age differences in employees' work-related experiences).

Response Expectations and Responsiveness: The Role of Age

Response expectations reflect the externally imposed demand (e.g., by coworkers or managers) to respond quickly when an ICT message is received (Day et al., 2012; Grawitch et al., 2018). Responsiveness on the other hand describes the actual behavior of responding promptly to received ICT messages (Grawitch et al., 2018; Sonnentag et al., 2018). In contrast to availability demands and psychological detachment from work, response expectations and responsiveness can also relate to the time during working hours (Hu, Barber, et al., 2021).

High responsiveness during working hours is predicted by both personal and situational factors (Sonnentag et al., 2018). For example, previous research identified ICT demands such as a high number of received ICT messages (Kalman & Ravid, 2015), perceived ICT interruptions (Sonnentag et al., 2018), high response expectations (Grawitch et al., 2018), and a high perceived importance of received ICT messages (Dabbish et al., 2005) as situational predictors of at-work responsiveness. In line with these findings, we expect a positive relationship between response expectations and responsiveness.

Regarding responsiveness, it is important to note that unlike low psychological detachment after work, high responsiveness at work is not necessarily detrimental or maladaptive. Rather, responsiveness can be a normal, essential, and thus adaptive work behavior needed to successfully deal with the demands of modern workplaces (Wajcman & Rose, 2011). Indeed, for example, responsiveness to ICT messages during working hours is positively related to task accomplishment (Sonnentag et al., 2018). High responsiveness can, however, also be maladaptive, specifically when employees are highly responsive even if this is not needed, for example, when received messages are not urgent and a quick response is not expected (Giurge & Bohns, 2021). Such an overly high, exaggerated responsiveness might interfere with performance on other tasks (Russell et al., 2017) as well as reinforce external and internal response expectations (Brown et al., 2014; van Zoonen & Rice, 2017). This in turn might lead to unrealistically high demands and related detrimental consequences, including burnout and exhaustion as well as impaired recovery and work-life balance (Barber et al., 2019; Barber & Santuzzi, 2015; Brown et al., 2014). Accordingly, we suggest that high responsiveness is a desired and adaptive work behavior when needed (i.e., employees should be responsive when this is expected of them) but turns maladaptive when shown by employees who are not actually expected to respond quickly to ICT messages.

We suppose that age serves as an indicator who is more likely to show adaptive vs. maladaptive responsiveness. Specifically, based on the same reasoning for why we expect an age advantage in dealing with availability expectations in relation to psychological detachment from work, we hypothesize an age advantage in dealing with response expectations in relation to responsiveness: We theorize that with increasing age, appraisal processes as well as coping and self-management behaviors improve (Rauschenbach et al., 2013; Scheibe & Zacher, 2013) and that older workers are therefore better at dealing with response expectations in an adaptive manner. That is, we argue that older employees will show more functional responsiveness in reaction to external response expectations in that they will be responsive when needed (i.e., when response expectations are high) but less so when not needed (i.e., when response expectations are low). Younger employees, however, will show less adaptive responsiveness, being highly responsive even if not expected.

Hypothesis 2:

Age moderates the positive relationship between response expectations and responsiveness such that it is stronger for older employees.

Age and Internal Workplace Telepressure

Whereas response and availability expectations represent external pressures to use ICTs for work purposes, people can also experience an internal urge to always be available and respond quickly to work-related ICT messages—a psychological phenomenon termed workplace telepressure (Barber & Santuzzi, 2015; Grawitch et al., 2018). More precisely, workplace telepressure is defined as an internally driven pressure, a preoccupation and urge to read and respond to ICT messages promptly (Barber et al., 2019).

As outlined, older employees might show higher resilience, better self-management, and more advantageous appraisal when facing work demands (Kooij et al., 2020; Scheibe, 2021; Scheibe & Moghimi, 2021; Scheibe & Zacher, 2013; see also Rauschenbach et al., 2013). We suggest that these age advantages also apply to how employees appraise and deal with work-related ICT demands, specifically to internal pressures

to be always available and respond quickly to ICT messages. In other words, we suggest that older employees might experience less internal workplace telepressure than their younger colleagues. This assumption is in line with findings that older employees experience lower "technostress" (Ragu-Nathan et al., 2008). Further, this assumption is supported by findings that show that individual experiences and characteristics that change with age, for example, higher calmness (Scheibe & Zacher, 2013) as well as higher conscientiousness and lower neuroticism (Roberts et al., 2006), are negatively related to internal workplace telepressure (e.g., Grawitch et al., 2018) and associated ICT behaviors (e.g., Russell et al., 2017).

Hypothesis 3:

Age is negatively related to internal workplace telepressure.

Like external ICT demands, especially availability expectations (e.g., Brauner et al., 2021; Dettmers et al., 2016), also internal workplace telepressure (Grawitch et al., 2018) is detrimental to psychological detachment from work (e.g., Barber et al., 2019; Santuzzi & Barber, 2018). Moreover, person characteristics related to beneficial appraisal processes (e.g., mindfulness; Haun et al., 2018) may buffer the effects of work demands on psychological detachment from work as suggested in the stressor-detachment model (Sonnentag & Fritz, 2015). Based on these considerations, we hypothesize that the effect of availability expectations on psychological detachment from work is moderated by internal workplace telepressure in a way that the negative relationship is weaker for employees low in telepressure.

Taking Hypothesis 3 into account, in which we suggest a negative relationship between chronological age and workplace telepressure, the moderation pattern that we hypothesize here reflects Hypothesis 1, which predicts that the negative relationship between availability expectations and psychological detachment from work is weaker in older employees. The expected moderating role of internal workplace telepressure is empirically supported by findings showing that the positive relationship between work-home interference and burnout is stronger for employees who report intensive work-related ICT use and problems to resist checking incoming messages (i.e., a construct similar to workplace telepressure; Derks & Bakker, 2014).

Hypothesis 4:

Workplace telepressure moderates the negative relationship between availability expectations and psychological detachment such that it is weaker for employees low in telepressure.

In addition to external response expectations, internal telepressure is positively related to responsiveness (Grawitch et al., 2018) and associated ICT behaviors (e.g., attention paid to one's inbox; Kalman & Ravid, 2015). Based on these results and following the idea outlined above that responsiveness is an adaptive behavior when needed (i.e., when response expectations are high) but rather maladaptive when shown under low external response expectations, we hypothesize that internal workplace telepressure moderates the effect of response expectations on responsiveness, such that the positive relationship is stronger for employees who experience low internal telepressure. In fact, we assume that employees high in telepressure will show high responsiveness irrespective of the external response expectations they face—meaning that for them, response expectations will be less strongly or even unrelated to responsiveness, but their mean level of responsiveness (reflected in the slope intercept) will be higher than for employees low in internal workplace telepressure. Considering Hypothesis 3, which suggests a negative relationship between chronological age and internal workplace telepressure, this hypothesized moderation pattern reflects Hypothesis 2, which predicts that the positive relationship between response expectations and responsiveness is stronger for older employees.

Hypothesis 5:

Workplace telepressure moderates the positive relationship between response expectations and responsiveness such that it is stronger for employees low in telepressure.

Study 2

Study 2: Methods

Study 2 examines internal workplace telepressure, predicted by age, as a moderator of the effects of availability expectations on psychological detachment from work. We included response expectations as a second ICT demand and tested age as well as internal workplace telepressure predicted by age as moderator of its effect on responsiveness.

Sample and procedure

We collected data in Germany in August 2020, 6 months into the COVID-19 pandemic, among employees using ICT in their job, working during daytime, and working at least 20 hr per week. That is, eligibility criteria were the same as for Study 1. Undergraduate and graduate students recruited participants as part of their theses by distributing a link leading to a study information and registration website. To obtain more reliable accounts on participants' responsiveness during work and psychological detachment from work in the evening, we conducted a daily diary study (for a similar approach, see Spieler et al., 2018; Venz & Boettcher, 2022). Study participants responded to a general survey about 1 week before taking the daily surveys, followed by daily surveys (at the end of work, in the evening) over two workweeks (Monday to Friday, i.e., a maximum of 10 study days per participant). To incentivize participation, we donated 1 EUR to a local charitable organization for every participant who responded to the daily surveys on at least five workdays. In conducting the surveys, we followed best-practice recommendations for diary studies in organizational research (Gabriel et al., 2019). Data collection took place online via www.soscisurvey.de. Participation was anonymous and voluntary, and participants could stop their participation at any time by either not responding to further surveys or by opting out via a link that was displayed at the bottom of every email that participants received during the study. We adhered to the basic principles and guidelines for ethical research of the German Research Foundation (DFG).

After providing informed consent, 112 persons registered for the study via an anonymous opt-in question, of which 106 participated in the general pre-survey. For the present study, we ultimately could use data provided by these 106 participants on 573 end-of-work surveys (measuring daily responsiveness at work) and on 509 evening surveys (measuring daily psychological detachment from work after

work). Accordingly, the final sample comprised 106 employed individuals. Participants were aged 20–63, mean age was 33.99 years (*SD* = 12.32), 58% were aged 30 years or younger, 20% were aged 50 or older. More than half of the participants were female (54%) and had received university education (64%). Mean organizational tenure was 6.12 years (*SD* = 8.04, range: 0–34). Participants worked in a broad of range of industries and occupational sectors including business administration and other business-related services, personal services, and production. The sample comprised of 74% salaried employees, 20% working students, 3% civil servants, and 2% self-employed; 37% held a supervisory role. Most participants (52%) had worked from home at least 1 day during the data collection period and most participants (79%) reported email being central to their work (*M* > 3.0 on a 5-point Likert scale from 1 to 5; *M* = 3.96, *SD* = 0.71).

Measures

Table 3 provides an overview of the descriptive statistics of and correlations between the measures of Study 2. Participants responded to all measures on a 5-point Likert scale ranging from *does not apply at all* (1) to *fully applies* (5), if not indicated differently.

Pre-survey: General measures.

Availability expectations were assessed with the respective four items of the ICT demands scale by Day et al. (2012). A sample item is "I am expected to be accessible at all times (e.g., through cell phone, instant messaging, or e-mail)". Cronbach's alpha was .77. Participants in a supervisory role reported significantly higher availability expectations than participants without a supervisory role ($r = .27$, $p < .01$). Men reported higher availability expectations than women ($r = .21$, $p < .05$). All other demographics as well as number of remote workdays were unrelated to availability expectations.

Response expectations were assessed with the respective two items of the ICT demands scale (Day et al., 2012). A sample item is "I am expected to respond to e-mail messages immediately". Cronbach's alpha was .79. Demographics were unrelated to response expectations.

Workplace telepressure was assessed with the 6-item workplace telepressure measure by Barber and Santuzzi (2015). Sample items are "When using ICT for work purposes . . .", "it is hard for me to focus on other things when I receive a message from someone" and "I feel a strong need to respond to others immediately." Cronbach's alpha was .89.

Age was operationalized as employees' chronological age in years, measured with one item like in Study 1.

Control variables at the person level (i.e., in the prediction of internal workplace telepressure by age) were gender, education, supervisory role, and weekly working hours. Like in Study 1, results of analyses without the control variables did not meaningfully differ from those with the control variables. For sake of conciseness, we therefore report the results of hypotheses tests without these control variables. Based on research suggesting that organizational tenure instead of chronological age is relevant in explaining age-related internal work experiences (Bedeian et al., 1992), we controlled for organizational tenure in the prediction of workplace telepressure by chronological age. Specifically, we wanted to rule out the possibility that internally experienced telepressure is lower for employees with high organizational tenure who likely have a more realistic impression of their respective organizations' external demands to be available and responsive, that is, that workplace telepressure is rather a result of experience within the organization than of processes related to aging. Importantly, the pattern of results without organizational tenure as control variable did not meaningfully differ from those with organizational tenure included.

Daily surveys: Daily measures.

Psychological detachment from work was measured daily in the evening survey with the respective four items of the most-used detachment scale in diary studies (Sonnentag et al., 2017), the recovery experience questionnaire (Sonnentag & Fritz, 2007). A sample item is "Tonight, I distanced myself from my work." Average Cronbach's alpha over the study days was .89, ranging between .84 and .92.

Responsiveness was measured daily in the end-of-work survey with 4 items, 3 of which were developed by Sonnentag et al. (2018; e.g., "Today, I responded immediately to online messages, even when I was busy with other things") and 1 which we additionally self-developed ("Today, I read incoming online messages immediately, no matter what I was working on"). Average Cronbach's alpha over the study days was .94, ranging between .86 and .96.

Table 3. Descriptive statistics and intercorrelations of variables of Study 2.

Variable		*M*	SD_p	SD_d	2	3	4	5	6	7	8
1	Employee age	33.99	12.32		.62**	−.22*	.03	.07	−.15	.13	−.22†
2	Organizational tenure	6.12	8.04			−.03	−.01	.05	−.03	−.04	−.24*
3	Workplace telepressure	3.01	0.88				.10	.32**	.39**	.03	.53**
4	Availability expectations	2.67	1.04					.53**	.39**	−.30**	.28*
5	Response expectations	2.68	1.03						.40**	−.15	.32**
6	ICT interruptions	1.95	0.64	0.60						−.46	.51**
7	Psychological detachment	3.62	0.83	0.81					−.22**		−.18
8	Responsiveness	2.62	0.79	0.65					.29**	−.02	

Note. Standard deviations at the person level (SD_p) and day level (SD_d) are displayed. Above the diagonal are correlations at the person level ($N = 106$). Below the diagonal are correlations at the day level ($N = 509–573$). Displayed correlations are standardized correlations calculated with Mplus, accounting for the nested data structure.
†$p < .10$.
*$p < .05$.
**$p < .01$.

As a day-specific *control variable*, we used ICT message interruptions. ICT interruptions have been both shown to be positively related to responsiveness (on the person level and on the day level; Sonnentag et al., 2018) and classified as a stressor (Russell et al., 2017). Accordingly, following the stressor-detachment model (Sonnentag & Fritz, 2015), we included ICT interruptions as a control variable. ICT interruptions were measured daily in the end-of-work survey with 4 items, 3 of which were used by Sonnentag et al. (2018; e.g., "Today, e-mails and other online messages disturbed me in doing my work.") and 1 which we additionally self-developed ("Today, I was held back in my work by incoming e-mails or other messages"). Average Cronbach's alpha over the study days was .92, ranging between .90 and .95.

Analytical approach

The data set has a hierarchical, two-level nature with days nested in study participants. To account for the resulting dependency in data, we conducted two-level analyses. Specifically, we specified two-level models with full information likelihood estimation in Mplus 8.5. Because the proposed predictor and moderator variables represent person-level variables (i.e., stable variables measured in the pre-survey), hypotheses tests were conducted at the person level. All pure person-level variables (i.e., organizational tenure, age, internal workplace telepressure, availability expectations, and response expectations) were grand-mean centered. The interaction terms of internal workplace telepressure with availability expectations and response expectations, respectively, were calculated using grand-mean-centered values. To achieve correct decomposition of the variance of the daily measured variables (i.e., the control variable of ICT interruptions and the outcome variables of responsiveness and psychological detachment from work) into their respective day-level and person-level parts, we modelled these variables and the relationships between them, respectively, on both analytical levels (Preacher et al., 2010). This procedure means that we used aggregated diary entries on responsiveness and psychological detachment from work as outcome measures (Spieler et al., 2018).

Study 2: Results

Descriptive analyses of the data (Table 3) revealed a significant bivariate person-level correlation between availability expectations and psychological detachment from work (r = –.301, p = .002). Age was unrelated to availability expectations (r = .032, p = .754) as well as psychological detachment from work (r = .126, p = .221). Response expectations were significantly correlated with responsiveness (r = .324, p = .009). Age was unrelated to response expectations (r = .071, p = .487) as well as responsiveness, albeit negatively correlated by trend (r = –.219, p = .060). Age was negatively correlated with internal workplace telepressure (r = –.224, p = .030). Workplace telepressure was unrelated to psychological detachment from work (r = .026, p = .853) yet positively correlated with responsiveness (r = .527, p < .001). Response expectations were unrelated to psychological detachment from work (r = –.146, p = .131) whereas availability expectations were positively related to responsiveness (r = .275, p = .010).

We tested all hypotheses by means of two-level path models. In the text, we report unstandardized estimates (est.) derived from these models. In a first model, we tested Hypothesis 1 also in Study 2 by specifying a two-level path model with age as moderator of the relationship between availability expectations and psychological detachment. In this hypothesis test, we did not consider telepressure, nor response expectations or responsiveness and did not include control variables to ensure comparability with Study 1 (Table 2, Model 1). The analysis revealed a negative main effect of availability expectations on psychological detachment from work (person-level est. = –.243, SE = .076, p = .001). Age was not significantly related to detachment (person-level est. = .008, SE = .006, p = .192). Also, age did not significantly moderate the relationship between availability expectations and psychological detachment from work (person-level est. = –.007, SE = .005, p = .176). Accordingly, we did not find support for a direct moderation effect of age (Hypothesis 1) in Study 2. Importantly, a direct moderation effect of age is not needed for a potential mediated moderation effect of age via internal workplace telepressure as suggested in our research model (Liu et al., 2012) and other studies on mediated moderation effects of age did not obtain a direct moderation effect of age, either (e.g., Li et al., 2021).

Second, we tested Hypothesis 2, which suggested age as moderator of the relationship between response expectations and responsiveness, by specifying another two-level path model. In this hypothesis test, we did not consider telepressure, nor availability expectations or psychological detachment from work. Table 4 shows both the standardized and unstandardized results of this model test. In this analysis, age was negatively related to responsiveness (person-level est. = –.013, SE = .006, p = .015). Response expectations were not significantly, but with a positive trend, related to responsiveness (person-level est. = .146, SE = .087, p = .095). The interaction between response expectations and age in predicting responsiveness was significant (est. = .014, SE = .007, p = .037). Simple slope tests revealed that the relationship between response expectations and responsiveness was positive and significant for older employees (+1 SD; simple slope est. = .316, SE = .101, p = .002) but not significant for younger employees (–1 SD; simple slope est. = –.025, SE = .136, p = .853). A look at the interaction plot (Figure 2A) reveals that the slope for younger employees has a relatively higher intercept than that for older employees, indicating that younger employees were more responsive even if not needed. This finding reflects our suggestions. Accordingly, Hypothesis 2 was supported.

Hypotheses 3–5 concern the role of workplace telepressure as an explanation for the hypothesized age advantage in dealing with ICT demands. We tested Hypotheses 3–5 at once by specifying one overall two-level path model; results did not differ when each outcome was tested separately. Both standardized and unstandardized results are shown in Table 5. The control variable of ICT interruptions was positively related to responsiveness (day-level est. = .319, SE = .071, p < .001; person-level est. = .413, SE = .116, p < .001) and negatively related to psychological detachment from work (day-level est. = –.293, SE = .093, p = .002; person-level est. = –.576, SE = .151, p < .001). Furthermore, availability expectations tended to be negatively related to psychological detachment from work (person-level est. = –.125, SE = .073, p = .088) whereas response expectations were not significantly related to responsiveness (person-level est. = .096, SE = .091, p = .294). Regarding main effects of the proposed moderators age and internal workplace telepressure, age was unrelated to responsiveness (person-level est. = –.004, SE = .006, p = .447)

Table 4. Two-level path model results for Hypothesis 2 (Study 2).

	Unstandardized results			Standardized results		
Outcome: Responsiveness	**est.**	***SE***	***t***	**est.**	***SE***	***t***
Day level						
ICT interruptions	.320	.071	4.500**	.295	.062	4.765**
Person level						
Aggregated ICT interruptions	.477	.111	4.317**	.402	.101	3.995**
Employee age	–.013	.006	–2.429*	–.220	.089	–2.475*
Response expectations	.146	.087	1.672†	.199	.122	1.626
Interaction term						
Response expectation × Age	.014	.007	2.082*	.245	.117	2.087*

Note. est. = estimate, resulting from one overall two-level path model test that tests all relationships simultaneously. Employee age and response expectations were grand-mean centered.
†$p < .10$.
*$p < .05$.
**$p < .01$.

whereas telepressure was positively related to responsiveness (person-level est. = .295, *SE* = .090, $p = .001$) in the overall model. Interestingly, age tended to be positively related to psychological detachment from work (person-level est. = .012, *SE* = .006, $p = .053$) and workplace telepressure tended to be *positively* related to psychological detachment from work as well (person-level est. = .215, *SE* = .122, $p = .079$) in the overall model. R^2 values from the standardized Mplus output indicated that this model explained 13.7% of the variance in internal workplace telepressure and 31.5% and 33.5%, respectively, of the person-level variance in psychological detachment from work and responsiveness.

Hypothesis 3, which suggested a negative relationship between chronological age and internal workplace telepressure, was supported. Chronological age was significantly negatively related to workplace telepressure (est. = –.024, *SE* = .011, $p = .026$). Organizational tenure was not significantly related to workplace telepressure (est. = .020, *SE* = .015, $p = .193$).

The interaction between external availability expectations and internal workplace telepressure on psychological detachment from work was significant (est. = –.179, *SE* = .077, $p = .021$). Simple slope tests revealed that the relationship between availability expectations and psychological detachment from work was positive and significant for employees experiencing high telepressure (+1 *SD*; simple slope est. = –.283, *SE* = .106, $p = .007$) but not significant for employees experiencing low telepressure (–1 *SD*; simple slope est. = .033, *SE* = .094, $p = .725$). This is in line with Hypothesis 4. However, reflecting the surprising *positive* relationship of the moderator internal workplace telepressure with psychological detachment from work in the overall model, a look at the interaction plot (Figure 2B) reveals that the high-telepressure slope has a relatively higher intercept than the low-telepressure slope, seemingly indicating that experiencing telepressure might be beneficial to psychological detachment from work at least for employees who face low availability expectations. Accordingly, although Hypothesis 4 was supported, the relative ordering of the simple slopes does not align with our original assumptions.

The interaction between external response expectations and internal workplace telepressure on responsiveness was significant (est. = –.170, *SE* = .076, $p = .025$). Simple slope tests revealed that the relationship between response expectations and responsiveness was positive and significant for employees with low telepressure (–1 *SD*; simple slope est. = .246, *SE* = .100, $p = .014$) but not significant for employees with high telepressure (+1 *SD*; simple slope est. = –.055, *SE* = .125, $p = .661$). This is in line with Hypothesis 5. A look at the interaction plot (Figure 2C) reveals a relatively higher intercept of the high-telepressure slope than the low-telepressure slope, indicating that more telepressured employees were more responsive even if not needed. This finding reflects our suggestions. Accordingly, Hypothesis 5 was supported.

Implied in our research model (Figure 1) is that internal workplace telepressure mediates the moderating effect of age on the effects of availability and response expectations. We tested this type II mediated moderation (Liu et al., 2012) in an additional analysis by multiplying the path coefficient of age on internal workplace telepressure with the interaction coefficients of availability expectations and response expectations, respectively, with internal workplace telepressure. To test the significance of the mediated moderation indices, we applied Monte Carlo bootstrapping with 20,000 repetitions to create bias-corrected confidence intervals (Preacher & Selig, 2012). This approach follows the typical procedure of testing type II mediated moderation (e.g., Li et al., 2021). The mediated moderation index for the indirect moderation effect of age on the relationship of availability expectations with psychological detachment via internal workplace telepressure was .004 (95% CI = [0.0000, 0.0101]). Accordingly, we found support for an indirect moderation effect of age regarding psychological detachment (Hypothesis 1). The mediated moderation index for the indirect moderation effect of age on the relationship of response expectations with responsiveness via internal workplace telepressure was .004 (95% CI = [–0.0000, 0.0104]). Accordingly, we just found no support for an indirect moderation effect of age regarding responsiveness (Hypothesis 2).

Overall Discussion

In the current research, we explored possible age advantages in the context of work-related ICT use, more specifically in dealing with expectations to be available outside working

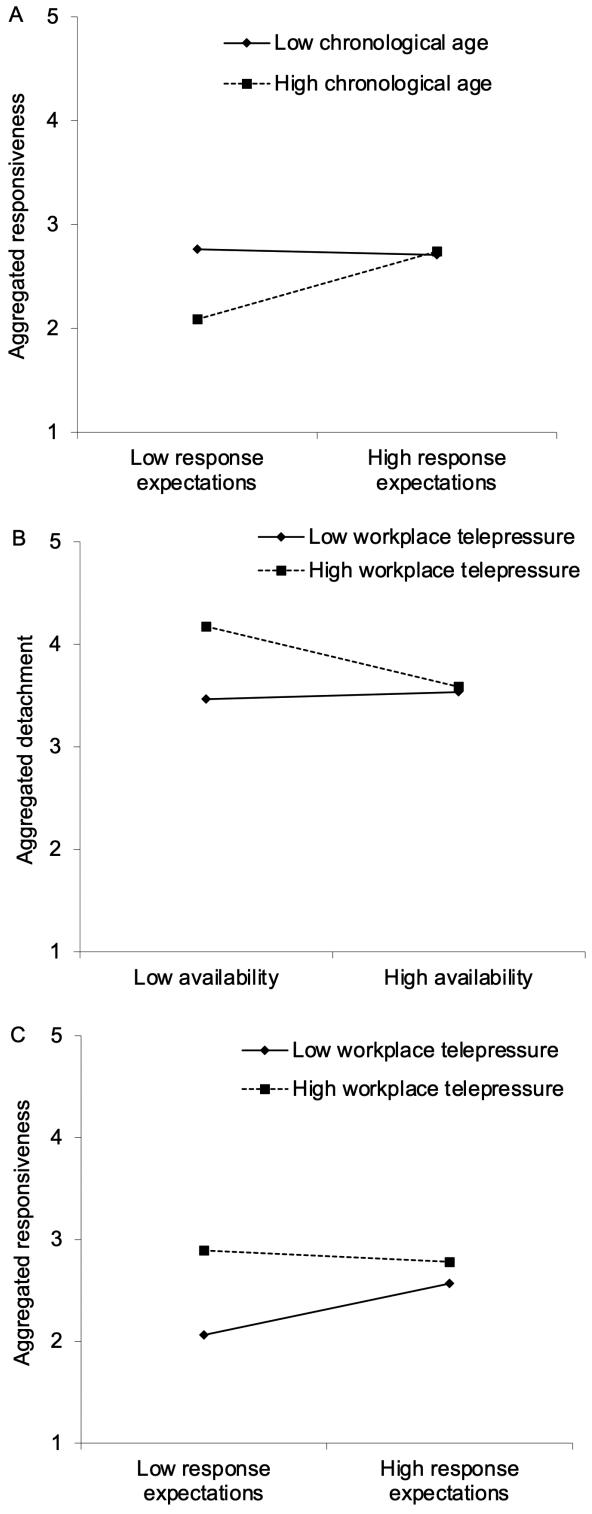

Figure 2. Interaction plots for moderation effects in Study 2. (A) Age as a moderator of the relationship of response expectations and responsiveness. (B) Telepressure as moderator of the relationship of availability expectations and psychological detachment from work. (C) Telepressure as moderator of the relationship of response expectations and responsiveness.

hours and to respond quickly during working hours. To this end, we followed a two-study approach. In Study 1, we examined data from more than 5,000 participants in a large-scale survey of employees in Germany just before the COVID-19 pandemic and indeed found indications for the hypothesized age advantage effect: For older employees, availability expectations outside working hours were less strongly related to impaired psychological detachment from work.

We suggested that the observed age advantage could be due to more favorable appraisal processes and better self-management with age. Therefore, in a subsequent diary study with more than 100 participants answering more than 500 daily surveys in 2020 during the COVID-19 pandemic, we investigated internal workplace telepressure as a possible age-related psychological explanation for the age advantage effect. Indeed, in Study 2, chronological age was negatively related to internal workplace telepressure which in turn directly moderated the relationship between availability expectations and psychological detachment from work. The diary study results additionally pointed toward another age advantage effect: Older employees seemed to more adaptively respond to ICT demands by only showing high responsiveness behavior when response expectations were high, that is, when responsiveness was needed. Again, this age advantage effect could be explained by lower internal workplace telepressure in older employees. In sum, both studies gave indications for age advantage effects in dealing with ICT demands. We identified internal workplace telepressure as an age-related construct that could help explain the psychological mechanism behind these age-advantage effects.

Theoretical and Empirical Implications

Exploring employees' age in the context of work-related ICT use, our findings have several implications for theory and research. We integrated research on aging at work, on technology use, and on work stress and recovery, examining possible age advantages in dealing with work-related ICT demands. By linking these lines of literature, we contribute to a more integrative understanding of worker aging and technology use in the era of digitization. Given that the digital transformation of the world of work is ongoing, having been accelerated by the COVID-19 pandemic, we expect our findings to have high relevance for the post-pandemic world of work, which will be defined by an aging workforce, high technology use, and blurred work–life boundaries, among others (OECD, 2020).

First and foremost, our findings contribute to the understanding of older employees' potentials as opposed to a negative view of aging at work—especially in the context of technology use (Mariano et al., 2022). Whereas older employees are often stereotypy thought to struggle with ICTs at work more than their younger colleagues (Berg-Beckhoff et al., 2017), our findings indicate that older employees might in fact be at an advantage and can better deal with work-related demands arising from ICTs. Precisely, we find that with increasing age, availability and response expectations are less influential in predicting employees' psychological detachment from work and their responsiveness behavior, respectively.

Specifically, regarding the negative relationship between availability expectations and psychological detachment from

Table 5. Two-level path model results for Hypotheses 3 to 5 (Study 2)

	Unstandardized results			Standardized results		
	est.	*SE*	*t*	est.	*SE*	*t*
Outcome: Workplace telepressure						
Organizational tenure	.020	.015	1.301	.176	.131	1.345
Employee age	−.024	.011	−2.229*	−.325	.133	−2.453*
Outcome: Psychological detachment						
Day level						
ICT interruptions	−.293	.093	−3.148**	−.218	.072	−3.035**
Person level						
Aggregated ICT interruptions	−.576	.151	−3.803**	−.441	.122	−3.606**
Employee age	.012	.006	1.938†	.176	.091	1.936†
Workplace telepressure	.215	.122	1.757†	.238	.119	2.002*
Availability expectations	−.125	.073	−1.704†	−.157	.092	−1.707†
Availability expectation × Telepressure	−.179	.077	−2.309*	−.191	.084	−2.261*
Outcome: Responsiveness						
Day level						
ICT interruptions	.319	.071	4.498**	.295	.062	4.764**
Person level						
Aggregated ICT interruptions	.413	.116	3.552**	.352	.102	3.445**
Employee age	−.004	.006	−0.761	−.074	.098	−0.756
Workplace telepressure	.295	.090	3.269**	.364	.106	3.448**
Response expectations	.096	.091	1.050	.132	.129	1.024
Response expectation × Telepressure	−.170	.076	−2.244*	−.195	.084	−2.320*

Note. est. = estimate, resulting from one overall two-level path model test that tested all relationships and outcomes simultaneously. Person-level predictors were grand-mean centered.
†$p < .10$.
*$p < .05$.
**$p < .01$.

work (e.g., Brauner et al., 2021; Dettmers et al., 2016), we found age to buffer the detrimental effect of availability expectations directly (Study 1) and indirectly via its effect on internal workplace telepressure (Study 2), respectively. As such, our study contributes to research on work-stress recovery, which has largely neglected the role of age so far (Sonnentag et al., 2017), although research on aging and occupational health suggests that older and younger employees differ in health and well-being in reaction to certain job demands (Mühlenbrock & Hüffmeier, 2020). Our research stresses the importance of considering age heterogeneity of employees when studying work stress and recovery in an increasingly digitized world of work. Showing an age advantage also in the relationship between response expectations and responsiveness in Study 2, our research corroborates previous findings that many stereotypes on older employees do not hold empirically (Ng & Feldman, 2012) and extends this to technology-related age stereotypes (Berg-Beckhoff et al., 2017; Mariano et al., 2022).

Our findings from Study 2 suggest that decreased internal workplace telepressure in older employees could be one explanation for the found age advantages in dealing with ICT demands during and after working hours. However, although our results supported the hypothesis that the relationship between availability expectations and psychological detachment is weaker in employees who are lower in telepressure, we encountered some surprising results regarding internal workplace telepressure. In contrast to earlier findings (Barber & Santuzzi, 2015; Santuzzi & Barber, 2018), workplace telepressure was related positively—and not negatively—to psychological detachment from work in the overall analysis in our diary study. Therefore, employees high in internal workplace telepressure—and not to those low in telepressure—seem to have benefitted from low availability expectations in terms of psychological detachment from work. However, inspecting the bivariate correlations of age, internal workplace telepressure, and availability expectations with each other and with psychological detachment from work (Table 3) reveals a different pattern of relationships than the one found in the overall model test where all predictors and interaction terms were included together (Table 5). Specifically, whereas internal workplace telepressure was clearly unrelated to psychological detachment from work in the bivariate analysis, we obtained a tendentially positive relationship in the multivariate analysis. Thus, a suppression effect, the so-called reversal paradox (Tu et al., 2008), could be at play here. Hence, the intercepts and relative ordering of the slopes in Figure 2B must be interpreted with caution.

Nevertheless, even in the bivariate analysis, we could *not* replicate the negative relationship between internal workplace telepressure and psychological detachment from work reported in previous studies (e.g., Barber et al., 2019; Santuzzi & Barber, 2018). This likely points to the usefulness of using research designs that allow for a more reliable assessment of behavioral and psychological employee outcomes (e.g.,

using a daily measurement approach even when interested in person-level relationships and differences between persons, respectively; Spieler et al., 2018; Venz & Boettcher, 2022) instead of one-time measurements that might be prone to several biases.

Besides contributing to research on age in relation with technology use at work and work-stress recovery, our research contributes to the broader literature on work-related technology use (Hu, Park, et al., 2021; Wang et al., 2020). By looking at external work-related ICT demands (Day et al., 2012), internal ICT-related perceptions (i.e., workplace telepressure; Barber & Santuzzi, 2015; Grawitch et al., 2018), and ICT-related work behaviors (i.e., responsiveness; Sonnentag et al., 2018) together, we bridge several empirical approaches to study work-related ICT use (Hu, Barber, et al., 2021). Precisely, we show that external and internal pressures to use ICT for work-related communication *interact* in predicting employee outcomes. In this regard, our findings extend previous research that acknowledged that external expectations around ICT use do not necessarily trigger a felt need to conform to them and that internal telepressure must be considered as additional predictor (Barber & Santuzzi, 2015; Grawitch et al., 2018). We suggest that in fact the interplay of external and internal ICT-related expectations matters to understand for whom ICT demands are related to outcomes (Day et al., 2012).

Examining not only availability expectations as an ICT demand that employees are confronted with outside their regular working hours but also considering response expectations as an ICT demand that employees are confronted with during their regular working hours (Grawitch et al., 2018) brings further interesting contributions in this regard (Hu, Park, et al., 2021). In fact, our findings indicate that usually functional ICT behaviors (i.e., responsiveness) may turn maladaptive for some employees, namely for younger employees and those with high internal workplace telepressure. As such, our study highlights the need for a differentiated view not only on ICT demands (e.g., Day et al., 2019) but also on employees' reactions and behavioral approaches to these ICT demands and on individual differences in this conjunction.

Finally, by using a two-study approach with different research designs—a representative large-scale employee survey and a diary study that allows for more reliable measures of behavioral and psychological outcomes (cf. Venz & Boettcher, 2022)—we can give some indication on the robustness of our findings. This is especially true because we conducted the two studies at different points in time, namely Study 1 just before and Study 2 during the COVID-19 pandemic. As such, our research shows that findings from pre-COVID studies may be used to explain work experiences during the pandemic. In reverse, findings obtained during the pandemic may accordingly be well suitable to inform research and practice in post-COVID times.

Limitations and future directions

Our two-study approach—using different samples, different methodologies, different measurement instruments, and different time points before and during the COVID-19 pandemic—may have balanced out potential disadvantages of single-method, single-context approaches. Nevertheless, our research is not without limitations.

First, using data from a large-scale employee survey in Germany resulted in a rather narrow scope of Study 1. Whereas the study helped us to detect an age advantage in the relationship between availability expectations and psychological detachment from work in a data set representative for the German working population, we did not have the possibilities to investigate processes underlying and explaining this age advantage or to examine the suggested age advantage regarding other ICT demand–outcome relationships. Also, the age advantage effect we found in Study 1 was very small and thus could only be taken as an indication that there is a phenomenon that needs further investigation. To overcome the limitations of Study 1, we planned and conducted Study 2, which allowed us to investigate internal workplace telepressure as an explanatory mechanism of the age advantage suggested in Study 1 as well as replicate the findings regarding another ICT demand (i.e., response expectations) and outcome (i.e., responsiveness). In Study 2, we used a diary approach to obtain more realistic (i.e., reliable; Venz & Boettcher, 2022) information on participants' detachment and responsiveness—which as psychological experiences and behaviors are prone to day-to-day variability (Gabriel et al., 2019).

A limitation of our research might be that we relied on self-report measures in both studies. Therefore, common-method bias cannot be ruled out (Podsakoff et al., 2012). However, we measured the outcome variables time separated from the predictors and moderators in Study 2—what not only counters potential common-method bias but also helped us to establish a temporal sequence with ICT demands predicting subsequently measured behavioral and psychological reactions. Further, moderation effects are unlikely to be artifacts of common-method variance (Siemsen et al., 2010) and participants' indication of their chronological age is unlikely to be distorted.

Focusing on chronological age might not be sufficient, however, given that other operationalization of employees' age might be more meaningful in the context of work (Bedeian et al., 1992). Therefore, in addition to chronological age, we investigated whether organizational tenure—representing organizational age—might be of relevance for psychological and behavioral responses to ICT demands. Our analyses revealed that the age advantage we found could not be explained by tenure. Nevertheless, we encourage future studies to replicate our results using different concepts of age, such as functional, psychosocial, or life-span age (Kooij et al., 2008). Additionally, such future research might complement our studies by using more objective behavioral outcome measures (Gerpott et al., 2020), such as actual response time to e-mails or time spent with work-related ICT after hours.

Besides addressing the potential limitations of our research, future studies might shed light on some further open questions. We identified internal workplace telepressure as a mechanism underlying the found age advantage in dealing with ICT demands. We theoretically suggested that a possible explanation for lower internal workplace telepressure in older employees is that employees become better at self-management with increasing age, helping them to better deal with workplace demands (e.g., Scheibe & Zacher, 2013). Accordingly, future research might investigate the role of age-related self-management strategies, such as selective optimization with compensation (e.g., Schmitt et al., 2012; Venz & Sonnentag, 2015), in internal workplace telepressure and employees' reactions to ICT demands at and off work, for example, responsiveness (Sonnentag

et al., 2018), ICT overload appraisal (Venz & Boettcher, 2022), technology-assisted supplemental work (Eichberger & Zacher, 2021), and work-stress recovery (Ďuranová & Ohly, 2015).

Also, other motivational mechanisms besides internal workplace telepressure (Hu, Park, et al., 2021) might be examined as potential explanations of age advantage effects in the context of ICT demands but also ICT resources (Day et al., 2019). For example, it would be interesting to examine (workplace) fear of missing out (Hu, Park, et al., 2021) or workaholism (Grawitch et al., 2018) in this regard. In addition, also other internal or external pressures, such as job insecurity (Cheng & Chan, 2008), could play a role and warrant empirical investigation. Overall, more research on the role of age—and age-related mechanisms—in relation to work-stress recovery (Sonnentag et al., 2017) and work-related technology use (Mariano et al., 2022) is needed.

Practical implications

In the era of digitization, and especially with the COVID-19 pandemic, the share of employees having to deal with ICT demands has increased and is likely to stay high in the post-pandemic world of work. Our study contributes to the understanding of how employees may deal with high ICT demands and, thus, has several practical implications. First, our findings suggest that expectations to be available for work outside regular working hours pose a threat to employees' ability to psychologically detach from work. Detachment is an important recovery strategy and its inhibition over a longer period can result in impaired health, work–life balance, and performance (Sonnentag et al., 2022; Steed et al., 2021; Wendsche & Lohmann-Haislah, 2017). Therefore, availability expectations should be reduced for all employees, if possible, for example by establishing an organizational culture that makes nonavailability outside working hours the norm (Vieten et al., 2022). In case extended availability is necessary, it is important to communicate explicit expectations. Indeed, actual contacts outside working hours are far less common than the feeling of having to be available and the consequences of availability expectations are less detrimental if these expectations are perceived as legitimate (e.g., Brauner et al., 2021; Dettmers & Biemelt, 2018). Given that our findings indicate that availability expectations have more detrimental effects for younger employees and those higher in internal telepressure—with younger employees being more likely to experience higher telepressure—reducing availability expectations is especially crucial for these groups of employees.

Furthermore, our study revealed that response expectations are related to actual responsiveness behavior, particularly in older employees and those with low internal telepressure, respectively. This means that these employees are better able to adapt their behavior to the actual demand, being responsive when needed. Because overly high responsiveness may have unfavorable consequences (Wang et al., 2020), those employees who keep up high responsiveness even if not needed should understand that this might be a suboptimal strategy in the long-term. In this regard, employers and leaders should be aware that especially younger employees and those high in telepressure are prone to over-responsiveness and should openly address this issue in their communication of demands and expectations. For example, when sending ICT messages, senders (i.e., leaders but also coworkers or clients) could add a brief note clarifying their response expectations (Giurge & Bohns, 2021).

Whereas employees' age cannot be addressed in managerial interventions, our identification of internal workplace telepressure as an underlying mechanism that explains the age advantage in reactions to ICT demands opens possibilities for action. Specifically, employers could help employees reduce their internal telepressure, for example by training their self-regulation skills regarding ICT demands, such as by implementing interventions to foster employees' self-control strategies (Troll et al., 2022). Additionally, any interventions to reduce external availability and response expectations might simultaneously help decrease employees' internal workplace telepressure (Barber et al., 2019).

Finally, our study revealed positive effects of age in a context where these are not necessarily expected, namely in technology use at work. Incorporating these findings in organizational practices, such as mentoring programs or age-diverse work groups, could add to reduce negative age stereotypes toward older employees in the context of technology (Mariano et al., 2022). Regarding work in the digital context, younger employees may learn from their older colleagues to take on a more serene attitude.

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