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Drawbacks of work intensification during the COVID-19 pandemic for procrastination and irritation: work from home as a further risk and social support as a potential buffer?

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The use of information and communication technologies while working from home during the COVID-19 pandemic may have increased flexibility and compatibility of different life domains, but may have also increased work intensification – which in turn may jeopardize wellbeing and task performance. While work intensification is assumed to relate positively to procrastination as well as irritation, the extent of work from home was expected to strengthen these relationships. Social support may attenuate these moderations. The assumptions were tested in two independent, comparable samples (S1, $N = 347$; S2, $N = 1,066$) during two stages of the COVID-19 pandemic (November 2020, 2021). Data were collected via online questionnaires using established scales (preregistered before analyses). Work intensification was significantly positively related to procrastination as well as cognitive and affective irritation in both samples. The extent of work from home strengthened the relationship between work intensification and procrastination (S2), while in S1 this held true only when persons reported not having their own study at home. Social support did not moderate the moderations. By replicating results in two different samples, this study contributes by being the first to examine the relationship between work intensification and procrastination, while further confirming the positive relationship between work intensification and irritation. The extent of work from home seems to pose an additional risk for procrastination. Our research extends the research on remote work by showing the downsides, such as work intensification, which is positively related to irritation and procrastination, which are precursors to impaired wellbeing and task performance. This highlights the different negative outcomes that can result from non-ideal working conditions when working from home during the COVID-19 pandemic. Especially given that the pandemic paved the way for a high prevalence of work from home, future research should investigate beneficial contextual factors to provide the evidence base for the design of healthy and productive working conditions.

KEYWORDS

work intensification, procrastination, irritation, work from home, social support

1 Introduction

The COVID-19 pandemic outbreak has resulted in changes in work circumstances and life including an increase in work from home (Granter et al., 2019) and the use of new technologies (De et al., 2020). These changes may increase psychosocial risks, such as work intensification, which can subsequently hamper performance (e.g., Zacher et al., 2021) and decrease wellbeing (Meyer et al., 2019; International Labour Organization, 2020; Rudolph et al., 2021; Venz and Boettcher, 2022). Furthermore, antecedents of performance such as procrastination may be relevant to consider (e.g., Ferrari, 2001; Steel et al., 2001). Procrastination is defined as voluntarily postponing an intended and necessary activity (Klingsieck, 2013), is associated with poorer academic performance (Tice and Baumeister, 1997) and is also linked to cyberslacking and reduced engagement, particularly in a work from home setting (O'Neill et al., 2014).

Work intensification is defined as “the amount of effort an employee needs to invest during the working day increases” (Kubicek et al., 2015, p. 899). It can both quantitatively and qualitatively cause employees to perceive an increased pace of work, multitasking demands, and a reduction of breaks between tasks. This can have a detrimental effect on their wellbeing and motivation, as it requires significant energy and effort on their part, which can deplete their resources and result in strain and other negative stress-related outcomes (Kubicek et al., 2015; Mauno et al., 2023). The intensification of work has been studied as a stressor in the context of remote work (e.g., Kelliher and Anderson, 2010; Venz and Boettcher, 2022); previous findings underline the risk of work intensification when working from home (e.g., Bathini and Kandathil, 2019; Meyer et al., 2019).

Studying the associations of risk factors for performance and wellbeing of employees emanating from the extent of working from home is highly relevant as the COVID-19 pandemic and its lockdowns paved the way for a higher rate of working outside of the organization's office (Statista, 2022; WFH Research, 2023). Our study has three contributions. *First*, it contributes to the knowledge regarding consequences of work intensification by examining the relationships between work intensification and negative stress-related outcomes, specifically procrastination and irritation, as irritation is the subjectively perceived cognitive and emotional strain in the work context (Mohr et al., 2006). Procrastination, that is, the irrational delay of intended actions, was identified as a major challenge during the COVID-19 pandemic in a study conducted through semi-structured interviews (Wang et al., 2021). As aversive or overtaxing tasks are common reasons for procrastination (Steel, 2007), work intensification may be one of the explanations for this increase in procrastination. This is the first study to quantitatively examine the relationship between work intensification and procrastination. Examining the relationships of work intensification is necessary because it may become more relevant even when working from home. Our study shows that it is related, among other things, to procrastination due to increased drawing on self-regulatory resources. Practical implications of our study suggest that daily goal setting can help reduce procrastination and provide a sense of achievement. This is particularly important when working from home where external task feedback is limited.

The relationship between work intensification and procrastination will be explained based on the Appraisal, Attributions, and Adaption Model of Job Stress (AAA; Mackey and Perrewé, 2014; following Prem et al., 2018), which incorporates the transactional theory of stress (Lazarus and Folkman, 1984; Perrewé and Zellars, 1999) as well as self-regulation theories (Muraven and Baumeister, 2000). High job demands may also lead to irritation (e.g., Nolen-Hoeksema et al., 2008); particularly work intensification was related to cognitive and affective irritation (Scheel et al., 2023). In the long run, high demands can foster emotional exhaustion via irritation. The relationship between work intensification as a job demand and irritation will be explained through the health-impairment process of the Job-Demand Resource Model (JD-R; Demerouti et al., 2001). By incorporating the AAA and the JD-R to explain the hypotheses, the JD-R considers the broader concept of the model with the relationship of job demands in the form of work intensification and irritation as impaired mental health, while the AAA further explains the cognitive appraisal process of the proposed relationships between work intensification and procrastination as failure of self-regulation in relation to the extent of work from home and social support. Thus, we examine the relationship between work intensification and procrastination (indicating productivity loss) as well as employee irritation.

Second, our study contributes to the knowledge about the risks of working from home. We analyze the strengthening role of the extent of work from home for the links between work-intensification and procrastination as well as irritation, where the extent of work from home is defined as 1 day per week to full-time working from home (Gajendran et al., 2024). The sudden increase in mandatory work from home due to governmental regulations may be perceived as a stressor because the boundaries between life domains may become blurred and the work environment may not be as optimal as in the office. Niebuhr et al. (2022) show a positive correlation between the extent of work from home and the prevalence of stress-related symptoms during the first year of the COVID-19 pandemic (i.e., November/December 2020) in Germany. To the best of our knowledge, no prior studies have examined the moderating effect of the extent of work from home on the relationship between work intensification and procrastination as well as irritation. Working from home provides autonomy (Meyer et al., 2021), but the work environment also requires self-control (Troll et al., 2022), which is part of self-regulation (Gillebaart, 2018). This increased effort of working from home may be buffered by additional resources. *Third*, we contribute to the knowledge about resources potentially attenuating the risks of working from home with regard to detrimental consequences of work intensification. We hypothesize that moderating the extent of work from home depends on whether employees perceive social support in the form of cooperative and helpful colleagues; thus, social support is assumed to moderate the moderation by work from home. Qualitative data reported less procrastination for higher perceptions of social support for those working remotely (Wang et al., 2021), and a previous meta-analysis has shown weak moderating effects of social support on the relationship between stressors and unwell-being (Gonzalez-Mulé et al., 2021). However, the buffering role of social support for the extent of work from home as a stressor has not yet been examined. The

examination of the role of social support from colleagues reveals a potential resource that can assist in coping with job demands and, ultimately, in understanding how work can be better organized to reduce procrastination and irritation. This study contributes to the literature on remote work by showing the drawbacks, especially of work intensification, which is positively related to irritation and procrastination and it aims to inform designing work environments, both at home and in the office, to prevent procrastination and promote wellbeing. Another knowledge contribution is that the study shows possible countermeasures in the form of social support that not indirectly but directly affect irritation and procrastination. Furthermore, the study makes a significant theoretical contribution by confirming the AAA Theory and thereby demonstrating that work intensification is a threatening job demand. It fills research gaps by focusing on the situational perspective of procrastination with two samples during the COVID-19 pandemic in November 2020 and 2021, when work from home was mandatory respectively recommended for those who could do so. While this is the first study investigating the relationship between work intensification and procrastination, our results will confirm those of an earlier study (Scheel et al., 2023) that examined the relationship between work intensification and irritation. Additionally, this study examines the moderating effects of work from home as a risk factor and social support as a potential buffer in a changing work environment, which have not been previously studied.

1.1 Work intensification and procrastination

Work intensification is a job demand, which are physical, psychological, social, or organizational characteristic of the workplace (Demerouti et al., 2001). Work intensification results from accelerated changes such as an increase toward more services, globalization, and flexibility like work from home (Kubicek et al., 2015). Recent research on work intensification has broadened the scope to include all aspects of life, intending to improve efficiency, productivity, and performance (Mauno et al., 2023). In particular, the COVID-19 pandemic has further accelerated the work from home trend. When working from home, new tasks, such as more virtual meetings, generally require more coordination, which can lead to increased effort during the workday and thus to work intensification. Among other detrimental effects, work intensification may impede employee involvement in continuous improvement and job performance (Neirotti, 2018). Likewise, procrastination negatively affects performance (Tice and Baumeister, 1997; Steel, 2007), however, van den Berg and Roosen (2018) found no relationship between procrastination and performance or work engagement.

Procrastination is defined “as the voluntary delay of an intended and necessary and/or (personally) important activity, despite expecting potential negative consequences that outweigh the positive consequences of delay” (Klingsieck, 2013, p. 26); procrastination is seen as a form of self-regulatory failure (Steel,

2007). Most research on procrastination is conducted in the life domain of students, but increasing research draws on nonstudent domains such as in the workplace (e.g., Lonergan and Maher, 2000; Nguyen et al., 2013; Metin et al., 2016; Prem et al., 2018). Empirical evidence for procrastination being a personality trait covers, for instance, unfavorable employment conditions as compared to non-procrastinators (Nguyen et al., 2013). Contrary, within the situational perspective it is assumed that (state) procrastination is caused by situational features such as autonomy and task difficulty (Harris and Sutton, 1983; Klingsieck, 2013). For instance, low job demands and resources were found to be associated to procrastination at work via boredom (Metin et al., 2016). Work procrastination may be induced by situational work characteristics like work intensification, which is seen as a hindrance demand (Mauno et al., 2023). However, the empirical evidence for the distinct effects of challenge-hindrance stressors is generally not strong (Mazzola and Disselhorst, 2019).

No previous studies have examined the relationship between work intensification and procrastination, but studies showed that procrastination is positively related to time pressure and hindrance appraisal through within-person processes of cognitive appraisal and self-regulation (Prem et al., 2018). Additionally, Steel's (2007) meta-analysis found that task aversiveness is positively related to task procrastination in between-effect studies. Lack of autonomy, which is a component of task aversiveness, has also been found to be positively related to procrastination (Blunt and Pychyl, 2000). A recent study conducted during the COVID-19 pandemic found procrastination to be one of the key remote work challenges mentioned in semi-structured interviews with Chinese employees, with workload being related to lower procrastination in a subsequent cross-sectional survey study (Wang et al., 2021). However, with on average 7 daily working hours ($SD = 2$) as indicator, workload was rather moderate in this study. Accordingly, and similar to Metin et al. (2016), Wang et al. (2021) argue that boredom is the mediator between workload and procrastination. However, previous research has shown a mostly positive relationship between job demands and work procrastination from a situational perspective (e.g., Steel, 2007; Prem et al., 2018), while work intensification was likewise associated with poorer task performance (Mauno et al., 2020).

Theoretical arguments suggest an association of work intensification with procrastination. According to the transactional stress theory (Lazarus and Folkman, 1984), work intensification may be perceived as stress in the primary appraisal. Following the approach of Prem et al. (2018), this can be continued with attributions and action tendencies stated in the AAA model (Perrewé and Zellars, 1999; Mackey and Perrewé, 2014). Depending on the internal and external causes of stress, certain affective responses (emotions) lead to secondary appraisal coping choices (Perrewé and Zellars, 1999). For instance, if employees perceive work as stressful due to high work intensification (primary appraisal) and have difficulties working from home and limited social support (resources), they may withdraw (emotion-focused coping) in the secondary appraisal. The resulting action tendencies depend on the secondary appraisal and self-regulation (Mackey and

Perrewé, 2014). Procrastination may occur when self-regulation effort is high (Prem et al., 2018). Therefore, the more the work intensifies, the more likely employees procrastinate.

Taken together, based on the theory of transactional stress (Lazarus and Folkman, 1984), the AAA model (Perrewé and Zellars, 1999; Mackey and Perrewé, 2014), and the results of empirical research we hypothesize that work intensification is positively related to work procrastination.

H1: Work intensification relates positively to work procrastination.

1.2 Work intensification and irritation

The relationship between the job demand work intensification and wellbeing outcomes can be explained by the health-impairment path of the JD-R model (Demerouti et al., 2001). The health-impairment process proposed by Bakker and Demerouti (2017) posits that when job demands such as work intensification are high and resources such as social support are limited, individuals experience depleted energy levels, necessitating continuous physical and/or psychological exertion (cognitive and affective abilities). This depletion of energy results in psychological stress, leading to subsequent manifestations of impairment (Demerouti et al., 2001). Irritation, identified as a proximal mental health outcome of work-related stress, serves as a precursor to more profound impairments such as psychosomatic complaints and depression (Mohr et al., 2006). Therefore, irritation can be used as an indicator of strain, which is particularly relevant when examining the proximal effects of changing working conditions, such as work intensification during the COVID-19 pandemic. Irritation may result from a perceived goal discrepancy, with cognitive irritation or rumination being a specific subtype characterized by reinforced efforts toward goal achievement (Mohr et al., 2006). Cognitive irritation, in turn, contributes to the development of depression, as demonstrated by research such as Harrington and Blankenship (2002). Furthermore, the subcategory of affective irritation, manifested as irritability, represents a heightened state of mental strain where individuals lose the motivation to pursue specific goals (Mohr et al., 2006). In sum, the health-impairment process unfolds as high job demands such as work intensification coupled with limited resources deplete energy, leading to psychological stress and, subsequently, mental health issues such as irritation, rumination, or ultimately, depression. Previous research found support in that work intensification was related to emotional exhaustion (Fiksenbaum et al., 2010; Granter et al., 2019; Lawrence et al., 2019; Huo et al., 2022), psychosomatic complaints (Franke, 2015), stress (Blanco-Donoso et al., 2023), and irritation (Scheel et al., 2023). In summary, high job demands can lead to energy depletion, resulting in cognitive and affective irritation, which underpins the health-impairment path of the JD-R model (Demerouti et al., 2001). Thus, we postulate that work intensification is positively related to cognitive and affective irritation.

H2a-b: Work intensification relates positively to (a) cognitive and (b) affective irritation.

1.3 Moderating role of the extent of work from home

Although before the COVID-19 pandemic remote work was relevant and investigated (e.g., Kelliher and Anderson, 2010), its exploration was often motivated by employee preferences. A meta-analysis comparing studies before and during the COVID-19 pandemic showed significant differences between the pre- and the during-pandemic extent of work from home with different outcomes such as perceived isolation (Gajendran et al., 2024). During the COVID-19 pandemic, work from home became mandatory for those who could, making it difficult to generalize previous findings (Kniffin et al., 2021; Yu and Wu, 2021). Involuntarily work from home was perceived as a stressor already before the pandemic (Lapierre et al., 2016), moreover, the higher extent of work from home positively related to burnout during the pandemic, but this was not significant in the pre-pandemic data (Gajendran et al., 2024). Thus, the extent of work from home due to the COVID-19 pandemic will be considered as a potential stressor in the following. The boundaries between work and personal life may become blurred (Wang et al., 2021) and employees may struggle with self-regulation (Prem et al., 2018), especially when working from home during the COVID-19 pandemic, and thus procrastinate by, for instance, doing laundry or other household chores, answering the doorbell for neighbors' parcels, or interacting with family members.

Research on the relationship between work intensification and procrastination when work from home is limited. Previous research on trait procrastination showed that cyber slacking (involving non-work use of the internet on company time), is positively associated with procrastination and negatively affects perceived performance when working remotely (O'Neill et al., 2014). Procrastination can also impede the relationship between telework and wellbeing (Junça Silva et al., 2022). Additionally, Reinecke et al. (2018) investigated the relationship between trait procrastination and unwellbeing, which was partially mediated by insufficiently self-regulated internet use. Other causes of procrastination when working from home, such as distractions caused by the restless working environment at home, have not yet been researched. A review of procrastination and stress suggests that the risk of procrastination increases in stressful contexts, such as the COVID-19 pandemic, because procrastination is a low-resource way of avoiding aversive and difficult task-related emotions (Sirois, 2023). In line with the AAA model of job stress (Mackey and Perrewé, 2014) and the theoretical derivation of hypothesis 1, work from home may be perceived as an external source of stress in the secondary appraisal. This can lead to emotion-focused coping due to emotional withdrawal and failure of self-regulation, resulting in more procrastination (Prem et al., 2018). Therefore, we postulate that as the extent of work from home increases, the positive relationship between work intensification and procrastination becomes stronger.

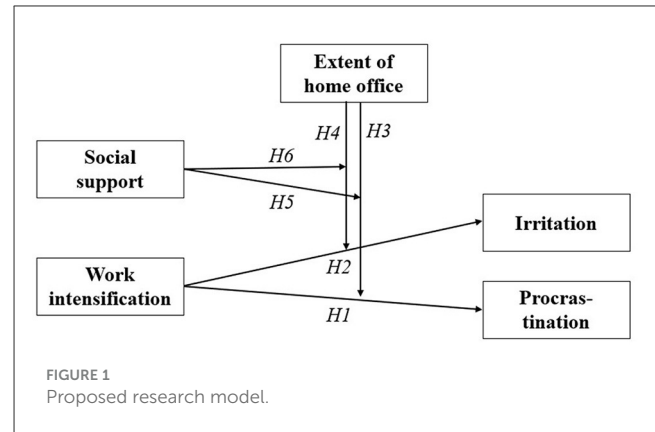
H3: The extent of work from home moderates the positive relationship between work intensification and procrastination; with higher extent of work from home, the relationship becomes stronger.

When working in work from home, work intensification may spill over from one domain to another (Kelliher and Anderson, 2010), that is, work intensification might have a stronger association with mental wellbeing as compared to working in the office. Possible moderators for the relationship between work intensification and wellbeing are work-home segmentation and work-home boundary management (Kubicek and Tement, 2016). The blurred boundaries between domains could result in increased ruminating about work. Based on the transactional theory of stress (Lazarus and Folkman, 1984), work intensification may be perceived as stressful during the primary appraisal. Additionally, the increase in work from home, which can also be perceived as a stressor, may lead to strain in the form of cognitive and affective irritation during the secondary appraisal or to reappraisal. Therefore, the higher the extent of work from home, the stronger the positive relationship between work intensification and cognitive as well as affective irritation is expected to be.

H4a-b: The extent of work from home moderates the positive relationship between work intensification and (a) cognitive irritation and (b) affective irritation; with higher extent of work from home, the relationships become stronger.

1.4 Social support as moderator of the moderation

Social support includes emotional aspects, such as appreciation, and instrumental aspects, such as help with work tasks; thus, it is a fundamental resource that protects wellbeing (Sonnetag et al., 2023). Sonnetag et al. (2023) state that meta-analyses indicate a direct, positive relationship between social support and wellbeing (Viswesvaran et al., 1999). However, meta-analyses do not generally support the buffering role of social support on the relationship between job demands and wellbeing (Guthier et al., 2020; Gonzalez-Mulé et al., 2021). Based on the AAA model of job stress (Mackey and Perrewé, 2014) and the JD-R model (Demerouti et al., 2001) we propose a positive relationship between work intensification and procrastination as well as irritation, which is moderated by the extent of work from home and this in turn is buffered by social support. Social support can be perceived as a resource that reduces stress resulting from work intensification combined with work from home. Therefore, social support acts as a buffer for the extent of work from home, and the moderation by extent of work from home may be less detrimental. Previous research shows that social support aids in reducing procrastination while working from home (Wang et al., 2021); they found that closer monitoring can be a form of social support that helped individuals better cope with procrastination during the COVID-19 pandemic, although pre-pandemic research suggests that monitoring while working from home could be detrimental (Lautsch et al., 2009). In this study, social support is not defined as monitoring by a supervisor, but rather as instrumental support by colleagues. Thus, when employees perceive work as stressful due to high work intensification (primary appraisal) and have high extent of work from home, having resources like social support by colleagues (e.g., via online communications or chats) may mitigate the moderating effect of the extent of work from home. That is, the strengthening



effect of the extent of work from home for the relationship between work intensification and procrastination may be attenuated due to less emotion-focused coping (due to social support) in the secondary appraisal. Likewise, social support may also attenuate the intensifying moderation of the extent of work from home of the positive relationship between work intensification and cognitive and affective irritation. Thus, social support may counter the problematic circumstances when working at home. To improve clarity and logical structure, the hypotheses are summarized in a research model, as shown in Figure 1.

H5: Social support attenuates the intensifying moderation of the extent of work from home of the positive relationship between work intensification and procrastination.

H6a-b: Social support attenuates the intensifying moderation of the extent of work from home of the positive relationship between work intensification and (a) cognitive as well as (b) affective irritation.

2 Materials and methods

2.1 Data collection and participants

The data were collected via online questionnaires in Germany with two separate samples, 18-30 November 2020 (S1) and 18-27 November 2021 (S2). Data were collected by students as part of course requirements. To be eligible for participation in the study, participants had to be employees. Both surveys took place during the COVID-19 pandemic, with different but comparable restrictions and living conditions - lockdown (November 2020) and 3G (November 2021). In November 2020, measures were implemented in Germany to contain the pandemic, such as contact restrictions in private and public spaces, and the closure or restriction of businesses ("lockdown"). As a result, those who were able to work from home were required to do so by federal law (Bundesgesetzblatt, 2020). In November 2021, vaccines against the coronavirus became available. Employers must again offer the opportunity to work from home, and employees must accept that offer, according to federal law. However, contact restrictions in private and public spaces based on the so-called "3G"-rules remained, that is, people had to provide evidence for being either vaccinated or recovered or tested thus indicate an individual's COVID-19 status (initials "G": "geimpft,

genesen, getestet” translated to English “vaccinated, recovered, tested”; [Bundesgesetzblatt, 2021](#)). Sample S1 includes $N_{S1} = 347$ participants who mainly worked in the service sector (40.6%), in production (18.4%), and in the public sector (13.5%). Most of those surveyed were white collar (84%), only a few were blue collar workers (3%; rest mixture of both). The average age was 36.26 years ($SD = 15.6$) and 60.8% were women (39.2% men). The $N_{S2} = 1,066$ participants of sample S2 worked to the better part also in the service sector (42.2%) and in the public sector (23.8%), the mean age was 42.7 years ($SD = 15.32$), and 55.5% were women (44.3% men, 0.2% diverse). Most participants worked in white collar jobs (73.5%) and few in blue collar jobs (10.1%). All analyses of the studies were pre-registered (<https://doi.org/10.17605/OSF.IO/4KBYV>).

2.2 Operationalization

The independent variable *work intensification* was assessed with the intensification of job demands scale (IDS, [Kubicek et al., 2015](#)). The subscale work intensification includes four items such as “It is increasingly rare to have enough time for work tasks,” which had to be rated for agreement on a Likert scale with anchors ranging from 1 = *not at all* to 5 = *completely*. The scale demonstrated moderate internal consistency in both samples ($S1, \alpha = 0.75$; $S2, \alpha = 0.88$).

The dependent variable *procrastination* was measured with six items such as “I postpone the start of important work until the last moment” ([Höcker et al., 2017](#)). The instruction explicitly asked for the assessment of the items with regard to work context only. The items had to be rated for agreement on a Likert scale with anchors ranging from 1 = *never* to 7 = *always*. The scale demonstrated high internal consistency in both samples ($S1, \alpha = 0.95$; $S2, \alpha = 0.95$).

The dependent variable *irritation* was measured with the two subscales of cognitive and affective irritation, indicating psychological strain in the work context ([Mohr et al., 2006](#)). *Cognitive irritation* was assessed with three items such as “I am having a hard time mentally switching off after work.” which had to be rated for agreement on Likert scale anchors ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The scale demonstrated high internal consistency in both samples ($S1, \alpha = 0.86$; $S2, \alpha = 0.86$). *Affective irritation* was measured with three items such as “When someone approaches me, it happens that I react grumpily.” with the same scale anchors. The scale demonstrated high internal consistency in both samples ($S1, \alpha = 0.89$; $S2, \alpha = 0.89$).

The moderator *extent of work from home* was assessed with the extent of work from home during the lockdown measures with a single item for S1 (“How often do you currently work from home, in the times of the pandemic and lockdowns?”) and for S2, that is, “How often do you work from home now in the 3G time?”, which was developed by the research team. The items had to be answered on a scale ranging from 0 = *not at all* to 10 = *completely*, in order to capture the extent of work from home more fine-grained as would be possible with asking for full days per week worked from home. Previous research measured extent of work from home also as a continuous variable like the percentage of week when working from home as well as days or hours per week worked from home ([Gajendran et al., 2024](#)).

The second moderator *social support* was measured with three items from [Herrmann et al. \(2012\)](#), an example item being “Working with my colleagues is cooperative and helpful.” The rating scale ranged from 1 = *not at all* to 5 = *completely*. The scale demonstrated high internal consistency in both samples ($S1, \alpha = 0.83$; $S2, \alpha = 0.82$).

As control variables, *age*, *work context work from home*, and *gender* were included. Work intensification may be more common with increasing age ([Mauno et al., 2019](#)), which was measured continuously. Work context work from home was chosen because it is assumed that the work context may affect how easily one is distracted from work and therefore more likely to procrastinate; also, the work context at home can be perceived as another stressor. Work context was measured with one item “Where do you mainly work when you work at home?” which was developed by the research team and is comparable to [Awada et al.’s \(2021\)](#) operationalization of workspace context. The items had to be rated in categories ranging from 1 = *In own study*, 2 = *In a shared (e.g., partner’s) study*, 3 = *In a study alcove (e.g., at a desk that is in the bedroom)*, 4 = *At the dining or kitchen table (or similar)*, 5 = *in other places (e.g., on the couch in the living room, on the floor, on the bed)*. A dummy variable was created with 1 = *in own study* and 0 = *all others*. It is expected that when employees work in their study, they can more easily avoid distractions from roommates or family members and can better ignore possible household chores, allowing for a more focused work atmosphere. Research shows that employees with their own study were less distracted ([Bergefurt et al., 2023](#)) and more productive ([Awada et al., 2021](#)). Therefore, a work from home work context in one’s study does not necessarily worsen work intensification through frequent interruptions and may not imply more procrastination by, for example, doing laundry instead of finishing a project. In deviation from the preregistration, we additionally tested gender as a control variable at the suggestion of a reviewer. Gender was measured with one item, “Which gender do you feel you belong to?” The item had to be rated in the categories 1 = *female*, 2 = *male* and 3 = *diverse*. Previous research indicated an association between gender and procrastination, such that men tend to procrastinate more than women ([Lu et al., 2022](#)), and differences were also reported for gender and unwell-being, indicating that women are slightly more emotionally exhausted than men ([Purvanova and Muros, 2010](#)). However, gender was not found to be significant in any of our analyses. Furthermore, there was no change in the significance of the hypothesized relationships, with only slight changes occurring for other control variables in some analyses. Consequently, we have chosen to retain the presentation of our results as is, in accordance with our preregistration.

2.3 Statistical analyses

For the analysis, H1 and H2 were tested using linear regression with bootstrapping (1,000 iterations), and the other hypotheses were tested by means of the macro PROCESS by [Hayes \(2017\)](#) in SPSS (5,000 iterations), using Model 1 (H3 and H4, moderation) and Model 3 (H5 and H6, moderated moderation). Before testing the hypotheses, *t*-tests showed no significant difference between

the two samples (S1 and S2) in the sample characteristics age and gender, but a difference of small effect for the work environment when working from home, with more persons having their own study at home in 2021 as compared to 2020 $\{M_{S1} = 0.29, SD = 0.46; S2: M_{S2} = 0.44, SD = 0.50; t(634) = -5.23, p < 0.001, 95\% CI [-0.21; -0.09], d = -0.31\}$. There was also no difference between samples for the key variables work intensification, social support and irritation, but again a small effect for the extent of work from home, with less persons working from home in 2021 as compared to 2020 $\{M_{S1} = 6.51, SD = 3.78; S2: M_{S2} = 5.16, SD = 3.63; t(1411) = 5.96, p < 0.001, 95\% CI [0.91; 1.79], d = 0.37\}$. Also indicating a small effect, procrastination was slightly higher in 2021 as compared to 2020 $\{M_{S1} = 3.11, SD = 1.32; M_{S2} = 3.40, SD = 1.34; t(2201) = -3.816, p < 0.001, 95\% CI [-0.44; -0.14], d = -0.22\}$. Factor analyses supported the structure of the variables, that is, according to the rotating component matrix, all scales loaded on one separate factor respectively irritation on two factors (cognitive and affective), thus confirming the original scales.

3 Results

In Table 1 the descriptives, bivariate correlations (Spearman Rho) and internal consistencies for all study variables for both samples S1 and S2 are displayed. In both samples, work intensification is significantly positively related to procrastination ($r_{S1} = 0.24, r_{S2} = 0.23, \text{both } p < 0.01$) as well as cognitive ($r_{S1} = 0.47, r_{S2} = 0.40$) and affective irritation ($r_{S1} = 0.32, r_{S2} = 0.23, \text{all } p < 0.01$) in both samples. Interesting on a descriptive level, while in 2020 (S1) 29% reported having their own working place at home, 1 year later (S2) 44.5% reported as such. Also, 23% were entirely working from home in 2020, but only 7.5% in 2021.

3.1 Hypotheses 1 and 2 – direct relationships

In support of H1, work intensification is significantly positively related to procrastination in both samples ($B_{S1} = 0.31, SE = 0.07; B_{S2} = 0.27, SE = 0.04, \text{both } p < 0.001, \text{Table 2}$). In both samples, work intensification is also significantly positively associated with cognitive ($B_{S1} = 0.55, SE = 0.06; B_{S2} = 0.45, SE = 0.03, \text{Table 3}$) and affective irritation ($B_{S1} = 0.35, SE = 0.06; B_{S2} = 0.22, SE = 0.03, \text{all } p < 0.001, \text{Table 4}$). Thus, H2a/b is also supported.

3.2 Hypotheses 3 and 4 - moderation

We tested whether the extent of work from home moderates the relationships between work intensification and procrastination (H3) as well as cognitive and affective irritation (H4a/b). The relationship between work intensification and procrastination was moderated by extent of work from home only for sample S2 (interaction coefficient $B_{S2} = 0.04, SE = 0.01, p < 0.001, 95\% CI [0.02; 0.06], \text{Table 5}$), but not for S1 (see Supplementary Table 1). Figure 2 shows that, according to our expectations, the relationship between work intensification and procrastination is stronger with a higher extent of work from home (+1 SD) as compared to a lower

TABLE 1 Descriptive statistics and Spearman Rho correlations of all study variables.

Variables	M_{S1}	SD_{S1}	M_{S2}	SD_{S2}	Age	Gender	Work from home N	Work Intensif.	Work from home X	Social support ^a	Procrastination	Irritation Cogn.	Irritation Aff.
S1													
Age	36.26	15.64	42.7	15.33	-	0.07*	-0.002	0.21**	0.56**	-0.05	-0.20**	0.001	-0.07*
Gender	1.39	0.49	1.45	0.50	0.07	-	0.11**	-0.18**	0.03	0.04	-0.10**	-0.08*	-0.08**
Work from home N	0.29	0.46	0.44	0.50	0.25**	0.12*	-	-0.07**	0.21**	0.04	-0.13**	-0.02	-0.06*
Work Intensif.	2.84	0.92	2.74	0.97	-0.10	-0.10	-0.07	(0.75/0.80)	-0.04	-0.15**	0.23**	0.40**	0.23**
Work from home X	6.51	3.78	5.16	3.63	-0.08	-0.02	-0.008	0.07	-	0.06*	0.02	-0.05	0.04
Social support ^e	4.16	0.75	4.08	0.77	0.04	0.04	-0.07	-0.11*	0.07	(0.83/0.82)	-0.10**	-0.15**	-0.29**
Procrastination	3.06	1.30	3.09	1.24	-0.21	-0.05	-0.10	0.24**	-0.07	-0.25**	(0.95/0.95)	0.25**	0.29**
Irritation Cogn.	2.92	1.08	2.76	1.09	-0.12*	-0.08	-0.05	0.47**	0.11*	-0.17**	0.30**	(0.86/0.86)	0.42**
Irritation Aff.	2.52	1.03	2.38	0.95	-0.14*	-0.06	-0.01	0.32**	0.001	-0.35**	0.36**	0.48**	(0.89/0.89)

$N_{S1} = 347; N_{S2} = 1066$. S1 below diagonal; S2 above diagonal. Reliabilities Cronbachs α in the diagonal (S1/S2). Work from home X, Work from home extent; Work from home N, Work environment work from home; Work Intensif., work intensification; Irritation Cogn., cognitive; Aff., affective. Gender (1 = women, 2 = men). Work from home N (1 = own study, 0 = shared workplace, work niche, dining or kitchen table, other places). ^aAt work. ^{**} $p < 0.01$; ^{*} $p < 0.05$.

TABLE 2 Regression analyses for dependent variable procrastination (H1).

Variables	B_{S1} (SE)	95% CI_{S1}	B_{S2} (SE)	95% CI_{S2}	adj. $R^2_{S1/S2}$	
1	Constant	3.78 (0.19)	[3.40; 4.16]	3.94 (0.14)	[3.67; 4.23]	0.04/0.04
	Age	-0.02 (0.01)**	[-0.03; -0.01]	-0.2 (0.03)**	[-0.02; -0.01]	
	Work from home N	-0.13 (0.16)	[-0.44; 0.18]	-0.22 (0.08)*	[-0.38; -0.07]	
2	Constant	2.85 (0.29)	[2.28; 3.42]	3.19 (0.18)	[2.83; 3.56]	0.08/0.09
	Age	-0.02 (0.01)**	[-0.03; -0.01]	-0.2 (0.00)**	[-0.02; -0.01]	
	Work from home N	-0.09 (0.01)	[-0.39; 0.21]	-0.18 (0.07)*	[-0.34; -0.04]	
	Work Intensif.	0.31 (0.07)**	[0.16; 0.45]	0.27 (0.04)**	[0.19; 0.34]	
	Δ adj. $R^2_{S1/S2}$					0.04/0.03

$N_{S1} = 347$; $N_{S2} = 1066$. Bootstrapping with 1,000 iterations. *CI*, Confidence Interval; Work from home N, work environment work from home; Work Intensif., work intensification. Work from home N (1 = own study, 0 = shared workplace, work niche, dining or kitchen table, other places). ** $p < 0.01$; * $p < 0.05$.

TABLE 3 Regression analyses for dependent variable cognitive irritation (H2a).

Variables	B_{S1} (SE)	95% CI_{S1}	B_{S2} (SE)	95% CI_{S2}	adj. $R^2_{S1/S2}$	
1	Constant	3.25 (0.16)**	[2.93; 3.57]	2.77 (0.12)**	[2.53; 3.02]	0.01/-0.00
	Age	-0.01 (0.00)*	[-0.02; 0.00]	0.00 (0.00)	[-0.01; 0.01]	
	Work from home N	-0.07 (0.13)	[-0.33; 0.19]	-0.06 (0.07)	[-0.19; 0.07]	
2	Constant	1.58 (0.22)**	[1.13; 2.02]	1.49 (0.14)**	[1.23; 1.76]	0.22/0.16
	Age	-0.01 (0.00)	[-0.01; 0.00]	0.00 (0.01)	[-0.01; 0.01]	
	Work from home N	0.00 (0.12)	[-0.23; 0.23]	-0.01 (0.06)	[-0.13; 0.12]	
	Work Intensif.	0.55 (0.06)**	[0.44; 0.66]	0.45 (0.03)**	[0.39; 0.51]	
	Δ adj. $R^2_{S1/S2}$					0.21/0.16

$N_{S1} = 347$; $N_{S2} = 1066$. Bootstrapping with 1,000 iterations. *CI*, Confidence Interval; Work from home N, work environment work from home; Work Intensif., work intensification. Work from home N (1 = own study, 0 = shared workplace, work niche, dining or kitchen table, other places). ** $p < 0.01$; * $p < 0.05$.

extent of work from home (-1 SD). Thus, H3 could only partially be support for sample S2. As an interesting addition, persons indicating to have their own study when working at home (control variable) was significantly negatively related to procrastination in S2 ($B_{S2} = -0.22$, $SE = 0.08$, $p < 0.01$, 95% CI [-0.37; -0.07]). The extent of work from home did not significantly moderate the relationship between work intensification and irritation. Thus, H4a/b could not be supported (see [Supplementary Tables 2–5](#)).

that only in S1, and only for the relationship between work intensification and procrastination, the moderation by extent of work from home was moderated by work environment (moderated moderation coefficient $B_{S1} = -0.09$, $SE = 0.04$, $p < 0.05$, 95% CI [-0.17; -0.003]; see [Supplementary Table 12](#)). That is, high extent of work from home combined with having an own study even seemed to attenuate the relationship between work intensification and procrastination (see [Supplementary Figure 3](#)).

3.3 Hypotheses 5 and 6 - moderated moderation

Social support was tested as a moderator for the moderation of the relationships between procrastination (H5) and irritation (H6a/b) by the extent of work from home. However, for all proposed relationships the moderated moderation was not significant. Thus, H5 and H6 had to be rejected (see [Supplementary Tables 6–11](#)).

3.4 Explorative test

We tested exploratively whether the moderations by extent of work from home are moderated by whether persons had their own study when working from home or not. The analyzes showed

4 Discussion

Work intensification as experienced in two different phases of the COVID-19 pandemic was related to higher procrastination as well as to higher cognitive and affective irritation. While the extent of work from home strengthened the relationship between work intensification and procrastination only in the later of the two samples (i.e., S2) and not for irritation, social support was not moderating the relationships. However, an explorative analysis revealed a significant three-way interaction in S1, that is, the extent of work from home is significantly related to procrastination when not having an own study is additionally considered. The extent of work from home was not significantly directly related to neither procrastination nor irritation, but social support was directly significantly related to (lower) procrastination and irritation in both samples.

TABLE 4 Regression analyses for dependent variable affective irritation (H2b).

Variables	B_{S1} (SE)	95% CI_{S1}	B_{S2} (SE)	95% CI_{S2}	adj. $R^2_{S1/S2}$
1					
Constant	2.87 (0.16)**	[2.56; 3.17]	2.57 (0.11)**	[2.36; 2.77]	0.01/0.00
Age	-0.01 (0.00)*	[-0.02; -0.00]	0.00 (0.00)	[-0.01; 0.02]	
Work from home N	-0.01 (0.13)	[-0.25; 0.24]	-0.12 (0.06)	[-0.23; -0.01]	
2					
Constant	1.80 (0.23)**	[1.35; 2.25]	1.95 (0.13)**	[1.70; 2.20]	0.11/0.05
Age	-0.01 (0.00)*	[-0.02; 0.00]	0.00 (0.00)	[-0.01; 0.00]	
Work from home N	0.03 (0.12)	[-0.20; 0.27]	-0.01 (0.06)	[-0.20; 0.02]	
Work Intensif.	0.35 (0.06)**	[0.24; 0.46]	0.22 (0.03)**	[0.17; 0.27]	
Δ adj. $R^2_{S1/S2}$					0.10/0.05

$N_{S1} = 347$; $N_{S2} = 1066$. Bootstrapping with 1,000 iterations. CI, Confidence Interval; Work from home N, work environment work from home; Work Intensif., work intensification. Work from home N (1 = own study, 0 = shared workplace, work niche, dining or kitchen table, other places). **p < 0.01; *p < 0.05.

TABLE 5 Work intensification and procrastination moderated by extent of work from home; sample S2 (H3).

Predictor	B (SE)	LLCI	ULCI
Constant	3.29*** (0.21)	2.87	3.71
Age	-0.01*** (0.00)	-0.01	-0.005
Work from home N	-0.22** (0.08)	-0.37	-0.07
Work Intensif.	0.08 (0.06)	-0.05	0.21
Work from home X	-0.08** (0.03)	-0.14	-0.03
Work Intensif. x Work from home X	0.04*** (0.01)	0.02	0.06
R^2	0.087***		
ΔR^2 interaction (2 way)	0.011***		

$N_{S2} = 1066$. Bootstrapping with 5,000 iterations. LLCI, lower limit confidence interval; ULCI, upper limit confidence interval; Work from home X = work from home extent; Work from home N = work environment work from home; Work Intensif. = work intensification. Work from home N (1 = own study, 0 = shared workplace, work niche, dining or kitchen table, other places). ***p < 0.001; **p < 0.01; *p < 0.05.

Being one of the crucial job demands when working remotely (e.g., Bathini and Kandathil, 2019; Meyer et al., 2019), work intensification seems to be related to hampered performance as well as to reduced wellbeing (Scheel et al., 2023). The latter is replicated by our results for two specific time frames of lockdown measures (lockdown vs. “3G”), with mandatory respectively desired work from home where possible, and thus reinforce the notion of risk associated with work intensification regardless of remote or office work. However, the findings for procrastination are novel. While for instance Mauno et al. (2020, 2023) found work intensification being related to decreased performance, and among others O’Neill et al. (2014) reported that remote work relates to decreased performance, procrastination was not assessed so far. The results suggest that work intensification draws on self-regulatory resources, fostering procrastination, and work from home potentially enhances the problem. The significantly positive relationship between irritation and procrastination is in line with prior research about, for instance, higher academic procrastination with higher stress (Tice and Baumeister, 1997).

Reflecting our first contribution, our findings suggest a negative relationship between work intensification, a work characteristic

closely related to time pressure as in Prem et al. (2018), and procrastination. According to the AAA model and also the findings by Prem et al. (2018), we assumed a hindrance appraisal of work intensification (e.g., like Mauno et al., 2023 suggest) and a related increased drawing on self-regulatory resources, which in turn relates to higher procrastination. That is, following the transactional stress theory and the AAA model, while work intensification might be primarily appraised as a threat and the attributions would include anxiety and stress, the relation between the action tendency (to accomplish the work tasks) might be jeopardized by insufficient self-regulatory resources – and thus, procrastination of work tasks. However, we did not directly measure hindrance appraisal, attribution or self-regulation, and we assessed work intensification and procrastination at one point in time, though in two independent samples. Being generally in line with Prem et al. (2018) and their finding of a positive relationship between time pressure and procrastination, they found support for the mediation by challenge as well as hindrance appraisal - only at the within-, but not the between-person level. For the latter, occupational self-efficacy played an important role in overcoming workplace procrastination.

Complementary to the bore out hypothesis, which implies that procrastination is higher with low job demands and resources (e.g., Metin et al., 2016) respectively workload (Wang et al., 2021), the perception of increasing workload (i.e., work intensification) seems to relate to more procrastination either. The fear of being unable to cope with the amount of work might induce negative emotions, the tasks might be less likable when performing in isolation from coworkers, and both, negative emotions and task aversiveness (e.g., Steel, 2007; Tice et al., 2007), may cause procrastination.

Regarding our second contribution, while work from home seems to be a potential additional stressor, with higher work from home strengthening the detrimental relationship of work intensification and procrastination in some cases (S2), the extent of work from home was not significantly directly related to procrastination or irritation, but previous studies show a significant relationship between extent of work from home and burnout within the pandemic (Gajendran et al., 2024). The extent of work from home was also lower in the S2 sample than in the S1 sample, and either the significance of the moderation was depending on the specific COVID-situation where work from home was still

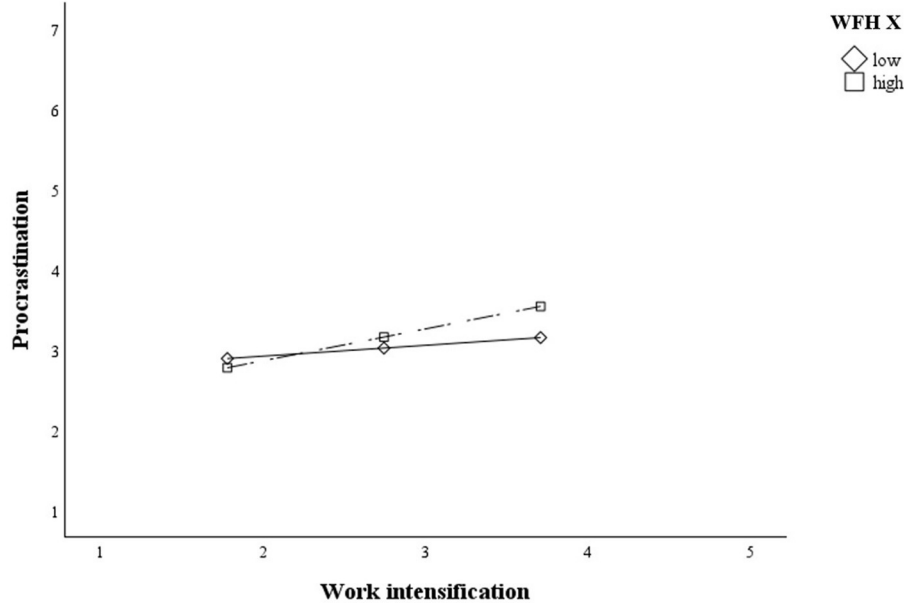


FIGURE 2

Work intensification and procrastination moderated by extent of work from home; Sample S2 (H3). $N_{S2} = 1066$. WFH X = Work from home extent.

rather novel in November 2020 (and mandatory where possible) as compared to 2021, with already long-term effects in 2021, or at the beginning of the COVID-19 pandemic, with half a year in S1, work from home was more seen as a protection against infection risks, while in November 2021 vaccination was available, giving back a sense of security. On the other hand, the explorative results indicate that rather than the extent of work from home, in the less voluntary work from home period in 2020 the work environment with having one's own study or not was more crucial for the work intensification–procrastination link.

Coming to our third contribution, social support was significantly directly related to procrastination as well as irritation even though social support was rated as rather high (mean above 4 given a scale maximum of 5), making a ceiling effect more likely. As procrastination is closely related to the fear of failure (Haghbin et al., 2012), social support might be an effective countermeasure for this fear. Social support is also significantly negatively related to work intensification, indicating that this resource might be closely related to the perception of work intensification – or with lower work intensification social support seems more available.

That said, given the cross-sectional design, causality claims are ruled out. With higher procrastination, the perception of work intensification may also be higher as work starts piling up. Also, with higher irritation, the work might also be experienced as more intensified, as mood is an important resource (e.g., Conservation of Resource model, Hobfoll, 1989) which may influence the evaluation of coping options.

4.1 Strength and limitations

The trend design with two independent, but comparable samples of sufficient size are among the strengths of this study.

While being in part a replication study of irritation but with, given the pandemic, unique points in time, analyzing the relation between work intensification and procrastination was a first attempt. Although the situation in both points in time of the data assessment was comparable in that the COVID-19 pandemic was ongoing and salient in everyday and work life (Bundesgesetzblatt, 2020, 2021), they differed in nuances given that on the one hand the situation became more normal and the available vaccination options in fall 2021 may have decreased the perception of personal infection risk. On the other hand, the ongoing limitations of social contacts and social distancing regulations may have increasingly worn out people. However, as we had a trend but not a panel design, comparisons of the two study results remain educated guesses.

The cross-sectional design of the two studies prevents any causal conclusions. In combination with solely self-reports, this also creates the problem of common method bias. However, factor analyses clearly supported distinct concepts of the variables. To counter social desirability bias, anonymity of participants and confidentiality of the data were ensured. While online surveys where the most feasible data assessment given the pandemic, and also the gathering of subjective evaluations naturally relies on self-report, it may limit the validity of the findings in regard to objectivity. The extent of work from home was measured by a single item with eleven different ranks; though this may be less reliable in general, the lack of complexity of the phenomenon justifies single item measurement. In addition, the extent of work from home could have been measured with other continuous variables, such as the percentage of the week spent working from home and the days or hours per week spent working from home (Gajendran et al., 2024). While other studies also used single-item measures or the result of two items (e.g., weekly work hours work from home in relation to total weekly work hours), with one item and 11 ranks the calculation of extent was left to subjective perceptions of the participants. All measures have their deficits, for

instance, asking for days (per week) work from home may neglect variance across weeks or the relation to the overall working hours, our measure comes at the cost that practical recommendations cannot be concretely applied to an ideal number of days for working from home. The choice of a validated, but general scale for procrastination (Höcker et al., 2017) leaves room for interpretation. The items indicated the delaying of intended important tasks, but with no further specification as to work tasks or the work context. Although the instruction directly asked for an assessment regarding work tasks and the whole framing of the survey as work-related implied that the questions were meant to cover the work domain, it cannot be ruled out that the participants rated the items regarding other life domains than work.

The samples were acquired by Bachelor students via pyramid among their families and acquaintances for course credits (plausibility of the data was checked). Thus, the data do not claim representativity. Additionally, generalizability is limited to rather white than blue collar employees, with previous work finding white collar workers scoring higher on the three forms of chronic procrastination (i.e., decisional, arousal, avoidant) than blue collar workers (Hammer and Ferrari, 2002). Persons working in production may be less able to work from home, and thus results may be more applicable to the public and service sectors than other sectors like production. In fact, the relation between trait procrastination and actual work task procrastination was found to be stronger for office workers as compared to non-office workers (e.g., technicians) in a study by Hen et al. (2021).

On the one hand the situation was unique with mainly involuntary as a nationwide measure of containment, with results maybe generalizable to comparable situations of involuntary collective work from home due to decreased office spaces in the aftermath of the COVID-19 pandemic. On the other hand, the proposed relationships were mainly unaffected by the extent of work from home, indicating general relationships in need of further detailed research. While the study results are mainly applicable on the German context, why and whether the relationships would differ between countries remains to be tested.

4.2 Research implications

From a methodological point of view, the measurement of procrastination could be explicitly tailored to the work context in order to restrict the interpretation of the data specifically to the work domain. Also, continuing this line of research about job demands and their relations to performance and wellbeing under varying extents of work from home should adopt longitudinal or even intensive longitudinal designs such as diary studies. Beside general circumstances of work from home, diary designs would enable to analyze fluctuations in the relationships between work intensification and procrastination as well as irritation including boundary conditions like working at home or in the office, or the extent of (in)voluntarily work from home. Also, the mediating mechanisms between work intensification, whether appraised as hindrance or challenge demands, the regarding attributions and subsequent action tendencies, and the resulting handling of work tasks combined with procrastination level according to the AAA

model could be investigated by means of diary designs. While time pressure leaves room for an appraisal as a challenge and as a hindrance (Prem et al., 2018), job demands like quantitative work intensification might be less ambiguous (e.g., Mauno et al., 2023). Whether for the latter the appraisal would be unequivocally as hindering needs to be demonstrated as yet. Potential differences in appraisal and coping behaviors related to short-, medium- and long-term exposure to work intensification and/or high levels of work from home are interesting with regard to interventions and thus worthwhile to investigate.

4.3 Practical implications

As causal conclusions are precluded by the cross-sectional nature of the data, practical implications may serve two perspectives. Following the direction of our theoretical arguments, decreasing work intensification by means of job design seems reasonable in order to curtail employee reactions like delaying tasks or increased irritation. This may include actually reducing workload, enforcing regular breaks during workdays, re-organizing work on team level including allowing for flexibility of work distribution among team members, or other measures closely tailored to the origins of work intensification. Following a reversed perspective, the perception of work intensification could be influenced by states of procrastination or irritation. That is, piling up work tasks due to procrastination may create actual work intensification, and being cognitively or affectively irritated may lead to perceptions of insufficient (cognitive or emotional) resources given the amount of work. While fostering recovery may be the crucial mean for decreasing irritation, measures against procrastination focus on task characteristics (e.g., autonomy and job enrichment, task aversiveness, Blunt and Pychyl, 2000; Lonergan and Maher, 2000; Van Eerde, 2000), occupational self-efficacy (e.g., Prem et al., 2018), personal resources like self-regulation (e.g., Steel, 2007; Tice et al., 2007), or attribution styles (e.g., locus of control, Lonergan and Maher, 2000). Daily goal setting, thus fostering a sense of achievement, may be especially helpful in situations lacking external task feedback like work from home contexts. A meta-analysis of studies about interventions to overcome procrastination suggests that cognitive behavioral therapy (which includes altering attributions), is superior with regard to reducing procrastination as compared to self-regulation, other therapeutic interventions, or interventions focusing on strengths and resources (Van Eerde and Klingsieck, 2018). With regard to work from home, moderating in sample S2, the work environment might indicate conditions relevant for performance and wellbeing. Actively reducing the likelihood of distractions might save self-regulatory resources; whether having a personal workplace at home is helpful in this regard remains to be investigated. In sample S1 it was unrelated to irritation, but mattered in combination with the extent of work from home for procrastination, in sample S2 having a personal study was significantly related to lower procrastination and affective, but not cognitive, irritation (though only small effects). In sum, having ones' own study when working from home seems to relate to lower procrastination. In sample S1 this was especially the case for

persons with higher extent of working from home; in sample S2 the extent itself was not crucial. While the reasons for procrastinating more if not having a separate room for working at home might be comparable (i.e., distraction, self-regulation efforts, blurred boundaries), circumstances were only to a certain degree. First, in November 2020, work from home was less voluntary and this also applied for other household members; for instance, distraction by household members might have been higher at S1 compared to S2. Thus, having ones' own study was more crucial the higher the extent of work from home. Second, at S2 fewer participants fully worked from home, which might indicate that persons with higher self-regulation problems when working from home (or less appropriate tasks for work from home) self-selected back to more often working from office. Also, distraction by household members might have been reduced at S2. Thus, the extent of (involuntarily) work from home lost relevance for procrastination, however, the context was still crucial.

However, both perspectives may not be mutually exclusive as a vicious or benign cycle of job demands and wellbeing as well as performance with mutual dependencies seems very likely. For instance, job demands are significantly related to burnout, with support for both causal directions but even higher support for the burnout → job demands link as compared to the other way around (Guthier et al., 2020). Measures like feedback by leaders, clarifying goals and goal planning (e.g., Masicampo and Baumeister, 2011, with students) even serve both directions of causality, as they may decrease both, work intensification and affective irritation by a reduction of uncertainty, and may reduce procrastination and cognitive irritation by reducing the aversity when tasks are clear (e.g., Ackerman and Gross, 2005).

Overall, work intensification is an important job demand which is related to procrastination as well as psychological strain in the work context during the COVID-19 pandemic and beyond.

Data availability statement

The datasets presented in this article are not readily available because the access to the dataset is restricted. Requests to access the datasets should be directed to lydia.bendixen@uni-flensburg.de.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the (patients/ participants OR patients/participants legal guardian/next

of kin) was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

LB: Writing – original draft, Writing – review & editing. TS: Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/forgp.2024.1379782/full#supplementary-material>

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