**Daily Workplace Embitterment and Work-Related Rumination during Off-Job Time: Illegitimate Tasks as Antecedents and the Buffering Role of Appreciation**

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**Abstract**

This daily diary study aims to expand the understanding of workplace embitterment (i.e., an emotional response to unjust work experiences) by determining its daily antecedents and consequences. By drawing on the stress-as-offense-to-self theory and the recovery literature we hypothesise that daily illegitimate (i.e., unnecessary and unreasonable) tasks (ITs) relate positively to daily embitterment. We argue that this relationship weakens on days employees experience higher appreciation from colleagues and supervisors than usual. Further, we expect daily ITs to relate positively and indirectly with work-related rumination (i.e., affective rumination, problem-solving pondering) and negatively and indirectly to psychological detachment via enhanced embitterment particularly on days employees experience lower appreciation. Seventy-oneemployees completed a diary for up to five consecutive workdays twice daily: at the end of the workday and bedtime. Daily unreasonable tasks related positively to embitterment, while higher appreciation from colleagues was found to mitigate this positive relationship. Finally, unreasonable tasks related positively to affective rumination and negatively to detachment via increased embitterment but only on days appreciation from colleagues was lower than usual. This study expands the nomological network of workplace embitterment and highlights its relevance for understanding daily employee well-being.

**Keywords:** workplace embitterment, work-related rumination, appreciation, diary study, psychological detachment

**Daily Workplace Embitterment and Work-Related Rumination during Off-Job Time: Illegitimate Tasks as Antecedents and the Buffering Role of Appreciation**

Linden (2003) defined embitterment as ‘an emotion encompassing persistent feelings of being let down, insulted and of being revengeful but helpless’ (p. 197). In the occupational psychology literature, the construct of embitterment is relatively new (Michailidis & Cropley, 2017, 2018, 2019). Yet, features of embitterment are readily recognised in organisations. Sensky et al. (2015) as well as Dunn and Sensky (2018) found that occupational health professionals frequently encounter employees who are treated unfairly by their supervisors or by their employer, and as a result, they feel embittered. The high prevalence of embitterment was also reported by Michailidis and Cropley (2017). In their cross-sectional study, more than half of the participants scored above 1.6 on a five-point scale, which, according to Linden (2003), indicates the presence of embitterment. In line with the just world hypothesis (Lerner, 1980), embitterment is seen as the aftermath of a violation of justice beliefs (Beck et al., 1979), and results in adverse consequences for one’s mental health (e.g., chronic strain; Kühn et al., 2018), physical health (e.g., poor sleep quality; Michailidis & Cropley, 2019) and work-related attitudes (e.g., reduced job satisfaction; Michailidis & Cropley, 2018). Also, Michailidis and Cropley (2017) showed that perceptions of organisational injustice elicit embitterment that in turn, relates to employees’ inability to recover from job demands during off-job time (Sonnentag & Lischetzke, 2018).

Past research is relevant because it highlights the role of justice as a significant antecedent of workplace embitterment (Michailidis & Cropley, 2018), while it also offers insights on its consequences (Kühn et al., 2018; Michailidis & Cropley, 2017, 2018). However, extant evidence is quite limited and does not provide a detailed view of the different drivers of embitterment, while there are no insights on boundary conditions. Importantly, studies so far overlooked potential within-person variations in embitterment. Embitterment has been initially defined as a prolonged emotional situation (Linden, 2003) meaning that employees may experience embitterment when unjust experiences pile up over time. However, embitterment, as an emotional state, may also occur as an immediate response to acute derogative work experiences and may subside short after (Linden et al., 2022). As such it can be argued that feelings of embitterment may also fluctuate within the same employee from one day to another.

In the present daily diary study, we aim to expand the current understanding on workplace embitterment by addressing these research gaps. First, we test whether embitterment can also be seen as a state that exhibits substantial within-person variations. Based on the literature that supports the dynamic nature of emotions (e.g., Reis et al., 2018), we argue that employees may feel more embittered than usual on certain days than on others as a response to their daily experiences at work. By investigating the dynamic nature of workplace embitterment, we contribute to the development of the construct by pointing out that embitterment is not only an enduring condition, but also a dynamic state. This is an important contribution because it provides a more complete understanding of embitterment, and consequently, it allows explaining not only individual differences in embitterment but also within-person variations, as well as the proximal antecedents and consequences of these variations (Ohly et al., 2010).

Second, we aim to expand the nomological network of daily embitterment by unravelling its daily antecedents, protective factors, and consequences. We draw on stress-as-offense-to-self (SOS) theory (Semmer et al., 2007) and the recovery literature (Sonnentag et al., 2017) to determine significant workplace characteristics that are derogative and capture justice violations leading to embitterment and consequently, to unsuccessful recovery. According to SOS theory (Semmer et al., 2007), threats to one’s self-image (i.e., anything that signals a lack of appreciation and respect), can trigger stress and unfavorable outcomes. Within this framework, illegitimate tasks (ITs) refer to tasks that are considered as unnecessary and/or unreasonable, and, as such, may threaten one’s self esteem and violate justice rules. Building on SOS theory and the evidence that workplace embitterment is triggered by justice violations (Michailidis & Cropley, 2017), we propose that daily ITs are triggers of daily workplace embitterment. Further, according to SOS theory, a job resource that may buffer the unfavorable effects of ITs is appreciation from relevant others at work. Hence, we examine whether appreciation from supervisors and colleagues may weaken the positive relationship between daily ITs and daily embitterment. Next, we focus on the effects of daily workplace embitterment for employees’ life outside work. Previous studies have indeed indicated that the damaging effects of embitterment are not only present in the workplace but can also extend to the personal lives of employees and determine their recovery from job demands (e.g., Michailidis & Cropley, 2017, 2018, 2019). The experience of embitterment could thus lead to unfavorable consequences for employee recovery during off-job hours (Sonnentag & Lischetzke, 2018), as employees might end up engaging in work-related rumination (i.e., affective rumination, problem-solving pondering) and fail to detach from work (Cropley & Zijlstra, 2011). This is logical because embitterment, unlike other emotions that might dissipate quickly, can linger as employees may remain fixated on the unfairness of the event that caused the feeling of embitterment (Linden, 2003). Previous research that linked embitterment with rumination was cross-sectional and did not capture the dynamic nature of recovery experiences (e.g. Michailidis & Cropley, 2017). As such, with this study, we aim to validate these findings regarding the consequences of embitterment on rumination when their dynamic nature is taken into account.

All in all, our study adds to the extant literature on embitterment by providing a more complete understanding of its nomological network and the underlying psychological processes that explain what triggers daily embitterment and what are the potential consequences of it. Also, we contribute to the literature by unfolding the conditions under which ITs are less likely to elicit feelings of embitterment. Last, linking daily embitterment to daily recovery experiences is relevant because it may also help understand enduring embitterment. Namely, if employees fail to recover on days they feel embittered, they may be at a higher risk for developing prolonged feelings of embitterment. Figure 1 depicts the proposed study model.

**Daily Workplace Embitterment**

Embitterment is an emotional state that refers to feeling let down, insulted and revengeful but helpless (Linden, 2003). Although it shares common features with other unpleasant emotions (e.g., anger, frustration), it is considered a distinct emotion because it is generated strictly when individuals are exposed to events that are perceived as unjust, insulting and that violate basic justice beliefs (Linden, 2003). Unlike anger or frustration, which can result from a wide range of negative experiences, embitterment is directly tied to situations that are seen as personal attacks or betrayals, leading to a profound sense of injustice. As such embitterment is not just about feeling wronged; it is accompanied by a strong desire to see justice restored or to seek revenge against the source of the perceived injustice.

A unique aspect of embitterment (compared to other negative emotions) is that the agent of the felt injustice or derogation is another person (Znoj et al. 2016). Hence, embitterment is an emotion that can only be other-directed. While people might feel anger or frustration directed inwardly when they believe they have failed or made a mistake, embitterment is inherently relational and externalized (Linden & Arnold, 2021). It arises when an individual perceives that another person has acted in a way that is unjust, derogatory, or damaging, thereby causing feelings of powerlessness and a desire for revenge (Znoj et al., 2016). In this way, embitterment is uniquely tied to interpersonal dynamics and the social context in which the perceived injustice occurs (e.g. in the workplace). Unlike other emotions that might dissipate over time or with changing circumstances, embitterment can linger and deepen, as the individual remains fixated on the unfairness of the event and the person responsible for it (Linden, 2003). Thus, while people can experience anger towards themselves, embitterment is specifically about the impact of another's actions, making it a distinct and socially embedded emotional response. All these distinct aspects indicate that embitterment is a relevant indicator of employee well-being.

Research so far has treated workplace embitterment as an enduring, prolonged condition (e.g., Michailidis & Cropley, 2018). These findings are relevant because they shed light on between-person variations in embitterment. Namely, they explain why some employees tend to feel more embittered than others. To this end, Sensky et al. (2015) found that embittered employees report lower levels of procedural justice and organisational support. In a similar vein, Michailidis and Cropley (2017) showed that over controlling supervision and perceptions of procedural injustice are significant antecedents of workplace embitterment. Regarding the outcomes of enduring embitterment, Michailidis and Cropley (2017) found that embittered employees experience greater difficulty recovering from work as they engage in more affective rumination and reduced detachment.

Even though the studies so far have advanced our understanding of workplace embitterment, they have overlooked its potential dynamic nature. The variability of passive (e.g., guilt, sadness) or active (e.g., anger, contempt) emotions is well documented in the literature (e.g., Reis et al., 2018), suggesting that emotions may vary daily due to within-person variations and peoples’ responses to specific daily events. Furthermore, Linden et al. (2022) recognised that embitterment can also be a short-lived state that is elicited as an immediate response to derogative events. Microevents occurring throughout the day may either intensify or lessen ones’ state of embitterment. For example, experiencing more intense injustice on certain days comparing to other days could eventually impact levels of experienced embitterment. As such, we hypothesise:

**Hypothesis 1**: Workplace embitterment varies significantly within employees daily.

**Daily Embitterment in the Context of SOS Theory**

SOS theory (Semmer, 2007) is considered appropriate to investigate the drivers of daily workplace embitterment because research suggests that embitterment is an emotional response to unjust work-related experiences (Michailidis & Cropley, 2018), and SOS theory explains how people react when justice rules are violated in the workplace. Accordingly, stress and strain are triggered when employees are exposed to unjust conditions that put a threat on their self-image. Such are conditions that are characterised by high levels of ITs (Semmer, 2007). ITs refer to tasks that fall outside the range of one's job role and are considered as unnecessary and/or unreasonable. Specifically, tasks are considered unnecessary if employees believe that they should not have existed in the first place (e.g., writing a report that no one will read). Unreasonable tasks are those that employees consider should be completed by someone else as they are not part of their job role (e.g., asking a senior employee to perform a novice’s work).

According to SOS theory (Semmer et al., 2015), ITs can threaten an individual's self-esteem and professional image, leading to unpleasant emotions. These tasks violate principles of justice by implicitly conveying disrespect toward one’s professional identity, resulting in negative emotional responses. Research has demonstrated a positive relationship between illegitimate tasks and negative emotions (e.g. irritability; Semmer et al., 2015). Also, in their diary study, Eatough et al. (2016) found that ITs were associated with lower state self-esteem, reduced job satisfaction, and increased anger and depressive mood. Likewise, using a daily diary study, Sonnentag and Lischetzke (2018) found that unreasonable tasks were associated with higher end-of-work negative affect at the between-person level, while unnecessary tasks were associated with higher end-of-work negative affect at the within-person level. ITs are believed to communicate social devaluation to employees in the workplace (Semmer et al., 2007). Thus, in line with the main assumptions of SOS theory, negative emotional responses specifically arising from perceptions of injustice are expected to rise. To enrich the extant evidence on the emotional consequences of ITs, the present study focuses on embitterment as an emotional response to unjust tasks. Embitterment arises only in response to situations perceived as offensive, unfair, or violating fundamental principles of justice (Linden, 2003), which renders it a highly relevant emotional reaction for SOS theory. Given that illegitimate tasks are inherently unfair in their assignments, embitterment can be expected to emerge as a response to these tasks. By focusing on embitterment, we attempt to further validate SOS theory by highlighting a relevant emotional reaction to exposure to ITs.

In the present study we test the relationship of the two forms of ITs, unreasonable and unnecessary with embitterment separately. Unreasonable tasks often exceed an employee’s role, capabilities, or responsibilities, generating a sense of injustice because they might violate expectations of fairness and respect in the workplace (Semmer et al., 2010). Being assigned such tasks that lack justification or feasibility, signals a disregard for the employee's time, skills, or position, undermining their sense of self-worth and this can enact feelings of injustice. Unnecessary tasks, are tasks that employees perceive as pointless and lacking relevance to their role, undermining as such their sense of purpose and value in the workplace. When employees are assigned such tasks, they may feel their time and skills are being wasted, and this might create perceptions of injustice, as they are perceived by the person as a 'social role violation' that threatens their self-worth (Semmer et al., 2010).

On the basis of this theoretical analysis, we formulate the following hypothesis:

**Hypothesis 2**: Daily unreasonable (a) and unnecessary (b) tasks relate positively with daily embitterment.

**Appreciation from Supervisors and Colleagues as Buffers**

Considering the detrimental role of ITs for embitterment, it is important to find out potential boundary conditions that may weaken these unfavorable feelings daily. Within SOS theory (Semmer et al., 2007), appreciation has been recognised as an important buffer of the effect of ITs and the threat of professional identity one experiences when being exposed to ITs. Appreciation refers to getting recognition for one’s achievements and qualities by significant others at work such as supervisors or colleagues (Muntz & Dormann, 2020). In line with Stocker et al. (2019), who argued that the content and frequency of appreciative behaviors varies depending on the source, we focus on appreciation from supervisors and from colleagues, as these different sources might have unique effects. Appreciation stemming from supervisors can significantly impact employees as it is perceived as a positive evaluation of one’s work (Gagné & Deci, 2005). Similarly, colleagues are regarded as valuable peers, and as such their appreciation might influence how an employee thinks and feels about their job (Morrison, 1994).

Studies showed that in conditions of higher (vs. lower) appreciation, the unfavorable impact of ITs is weaker (Apostel et al., 2017; Pfister et al., 2020). Hence, we argue that on days employees are exposed to higher levels of ITs than usual but at the same time feel that their work is positively evaluated and/or that they are valued by their peers, they are more likely to devaluate the meaning of ITs as less relevant and thus, prevent feelings of embitterment. This argument is also consistent with the buffering hypothesis of job demands-resources (JD-R) theory (Bakker & Demerouti, 2017). Accordingly, job resources (i.e., aspects of the job that may be functional in achieving work goals and reducing the cost of job demands) such as appreciation, may attenuate the negative impact of job demands on employee wellbeing. This is because employees who possess high levels of resources (e.g., appreciation from supervisors or colleagues) may deal more effectively with their job demands thus, mitigating their unfavorable effects (e.g., embitterment). Accordingly, when employees feel recognized and valued by their supervisors or colleagues, they can approach challenging or demoralizing situations, such as ITs, as less threatening to their self-worth, ultimately reducing the emotional consequences such as embitterment. On the basis of this theoretical analysis, we formulate the following hypothesis:

**Hypothesis 3:** Daily appreciation from supervisors/colleagues buffers the positive relationship between unreasonable (a) and unnecessary (b) tasks and embitterment, so that the relationship is weaker on days when appreciation is higher than usual.

**Daily Embitterment and Work-Related Rumination**

Previous research suggested that the negative consequences of embitterment do not limit in the work domain, but also spill over to employees’ life outside work. Indeed, cross-sectional research indicated that embitterment interferes with employee’s ability to adequately detach from work and recover (Michailidis & Cropley, 2017). Insufficient recovery from work has been linked to employees’ unintentional persistent thoughts in the absence of obvious external cues, termed as rumination (Cropley & Millward Purvis, 2003). Cropley and Zijlstra (2011) identified three constructs relevant to work-related rumination during leisure time: affective rumination, problem-solving pondering, and psychological detachment. Affective rumination is described as a cognitive state characterised by the appearance of intrusive work-related thoughts that lead to unpleasant emotions. Problem-solving pondering occurs when employees engage in constructive cognitive reflection about work-related problems. This form of ruminative thinking can be regarded as less damaging for recovery as employees, who ruminate with a problem-solving focus, are either likely to find a solution to the problem or re- evaluate their performance as an attempt to improve it (Cropley & Millward Purvis, 2003). Finally, psychological detachment refers to the condition where employees do not think about their work during their off-job time and as such they disengage mentally from work and recover successfully (Sonnentag et al., 2017).

Affective rumination implies that the individual ruminates about negative events that take place at work, or issues that may have become a threat (e.g., events that elicit embitterment). According to the perseverative cognition hypothesis (Brosschot et al., 2006), rumination prolongs the negative experience of an unfavorable state (e.g., feeling embittered) beyond the immediate presence of the stressor (i.e., ITs). Following this logic, we expect that experiencing embitterment at work will relate to increased engagement in affective rumination. This is because employees who feel embittered may fixate on the perceived unfairness or injustice of their work experiences, as these emotions are deeply tied to violations of their sense of fairness, respect, or dignity. This type of rumination may serve as an attempt to process or make sense of these perceived injustices but may end up in resulting in a prolonged negative emotional state. Indeed, having intrusive, ruminative thoughts is a dominant characteristic of embittered individuals, as in the case of embitterment, intrusive thoughts act as constant reminders of the insult (Linden, 2003). Also, we argue that on days employees feel embittered, they are likely to engage in problem-solving pondering as they might want to find solutions and ways to resolve the source of embitterment. Problem-solving pondering differs from affective rumination in that it is more action-oriented and focused on resolving the source of the problem rather than merely dwelling on it. For instance, on a day when an employee feels embittered because of the ITs assigned to them, they may reflect on how to effectively communicate their concerns to their supervisor, seek clarification about role expectations, or explore ways to prevent similar situations in the future.

Finally, as those who experience embitterment “recall the insulting event over and over again” (Linden 2003, p.197), it is likely that on days employees are more embittered, they will be less able to psychologically detach from work. This difficulty may arise mostly because employees who experience embitterment may focus on the negative event, and in an attempt to analyse and process the injustice they might be unable to psychologically detach from it during off-job hours. Indeed, embitterment has been found to relate positively to work-related, affective rumination and problem-solving pondering, and negatively with detachment during off-job hours (Michailidis & Cropley, 2017). Yet, these findings were based on cross-sectional data without considering within-person variations. Hence, we hypothesise:

**Hypothesis 4:** Daily embitterment will relate positively to (a) affective rumination, and (b) problem-solving pondering, and negatively to (c) psychological detachment.

**Moderated-mediation processes**

Taking Hypotheses 2-4 together, we may argue for certain moderated-mediation effects. In line with the main assumptions of SOS (Semmer et al., 2007) theory, unnecessary and unreasonable tasks might elicit feelings of embitterment, as they are perceived by the person as a 'social role violation' that threatens their self-worth (Semmer et al., 2010). Further, we expect that the experience of embitterment will extend to the personal lives of employees and determine their process of recovery from job demands because it is argued to relate positively with affective rumination and problem-solving pondering and negatively to psychological detachment. All these indicate that embitterment may also function as a mediator in the relationships between ITs, on the one hand, and work-related rumination/detachment, on the other hand. More so, in line with SOS theory and the buffering hypothesis of JD-R theory (Bakker & Demerouti, 2017), it is expected that the positive relationships between ITs and embitterment will be stronger on days when appreciation from colleagues and supervisors is lower than usual. This implies that the indirect effects of ITs to affective rumination, problem-solving pondering and detachment via embitterment are conditional on the level of appreciation employees receive from their colleagues and supervisors on a daily basis. Based on this analysis we formulate the following hypothesis:

**Hypothesis 5a:** Daily unreasonable tasks will relate positively to (i) affective rumination, and (ii) problem-solving pondering, and negatively to (iii) psychological detachment via daily embitterment, particularly on days where appreciation from colleagues and/or supervisors is lower.

**Hypothesis 5b:** Daily unnecessary tasks will relate positively to (i) affective rumination, and (ii) problem-solving pondering, and negatively to (iii) psychological detachment via daily embitterment, particularly on days where appreciation from colleagues and/or supervisors is lower.

**Method**

**Procedure and Participants**

Ethical approval was granted by X University Ethics Committee. Τo increase chances of gaining a heterogenous sample and sufficient variance in the study variables (Demerouti & Rispens, 2014), the researchers and student assistants recruited employed participants from their own personal and professional network. A total of 115 working adults in Cyprus, who were informed about the study procedure, expressed interest in participating. Employees were reassured about the confidentiality and anonymity of their responses. After agreeing to participate, employees were asked to complete an online questionnaire that collected socio-demographic information, at least one day before starting the completion of the daily diary. A link to the online daily questionnaires was sent to participants over a period of five consecutive working days, twice a day: at the end of the workday before finishing work, and at bedtime. To match responses from the general questionnaire and the daily measurements, participants created a self-generated identification code each time.

Seventy-one employees completed the diary study for a minimum of three and up to five consecutive working days (response rate = 62%). After removing 19 daily responses due to excessive missing values (more than 70% of the daily questionnaire), we were left with 278 daily data points. Although the number of participants was relatively small, the number of daily measures was considered more than adequate for establishing within-person relationships. This arrangement of low-powered between-level and high-powered within-level sample is not unusual in diary studies (e.g. Gabriel, et al., 2011). Since our hypotheses were all at the within-person level, a smaller number of participants can be more appropriate as larger samples often result in overpowered within-person effects (Gabriel, et al, 2019). The sample included 28 males (39%) and 43 females (60%) with a mean age of 36 (*SD* = 13.46) years. Participants worked on average 40 hours per week (*SD* = 7.76) and had a mean organisational tenure of 11.12 (*SD* = 12.03) years. Most (64.8%) participants did not have supervisory duties and held a postgraduate degree (38%). Participants worked in different industry sectors, with the most representative being accounting/finance (22.5%).

**Measures**

All scales were translated in Greek from the original English versions and were checked for accuracy with the method of back-translation. Data on daily workplace embitterment, ITs, and appreciation were collected with the end-of-work diary surveys, while data on daily work-related rumination/detachment were collected before bedtime. We estimated two-level alpha reliability scores using parameter estimated from Multilevel Confirmatory Factor Analyses (see Geldhof et al., 2014).

**Daily workplace embitterment** was assessed with an adapted daily version of the scale developed by Linden et al. (2009) as used by Michailidis and Cropley (2017) for the work context. Specifically, 17 items (of the original 19) were used to assess daily embitterment (e.g., “Today at work, I have experienced one or more distressing events at work that hurt me and made me feel embittered”). Two items were omitted due to low face validity in the daily context. Statements were evaluated using a 5-item scale ranging from 0 (not true at all) to 4 (extremely true). Alpha reliability was αw =.93 at the within-person level and αb =.97 at the between-person level.

**Daily Illegitimate Tasks** were assessed with the daily adaptation (Eatough et al., 2016) of the Bern Illegitimate Task Scale (Semmer et al., 2010). Four items asked for tasks that were perceived as unnecessary (e.g., ‘‘Today at work did you have to work on tasks, which got you wondering if they had to be done at all?’’), and four items referred to unreasonable tasks (e.g., ‘‘Today at work did you have to take care of tasks, which you believe are unfair for you to have to deal with?”). Respondents indicated the frequency of each statement on a scale of 1 (not at all) to 5 (to a great extent). For unnecessary tasks the within-person reliability was αw =.78 and the between αb =.89, and for the unreasonable tasks these were αw =.79 and αb =.91, respectively.

**Daily Appreciation from Supervisors and Colleagues**was assessed with Jacobshagen et al.’s (2008) scale. Three items assessed appreciation from supervisors (e.g., “Today at work, my supervisor complimented my work*”*) and three items assessed appreciation from colleagues (e.g., “Today at work, my colleagues appreciated my help”). Items were rated on a 7-point scale ranging from 1 (not at all) to 7 (very frequently). Reliability for appreciation from supervisors was αw =.82 at the within- and αb =.94 at the between-person levels. For appreciation from colleagues within-person reliability was αw =.80 and between-person αb =.96.

**Daily Work-Related Rumination**wasmeasured with a daily adaptation of the scale by Cropley et al. (2012). The scale consists of three subscales, with five items each: affective rumination (e.g*.,* “Today, in my leisure time after work, I got annoyed by thinking about work-related issues”), problem-solving pondering (e.g., “Today, in my leisure time after work, I found myself re-evaluating something I have done at work”) and detachment, (e.g., “Today, in my leisure time after work, I was able to stop thinking about work-related issues”). Items were rated with a 7-point scale ranging from 1 (not at all) to 7 (to a great extent). Reliabilities at the within-person level were αw=.90 for affective rumination, αw=.75 for problem-solving pondering, and αw=.84 for detachment across the study days. The corresponding between-person level alpha reliabilities were αb=.96, αb=.84, and αw=.95.

**Strategy of Analysis**

Repeated measures data can be viewed as multilevel data, with repeated measurements (level-1, *N* = 278 study occasions) nested within individuals (level-2, *N* = 71 participants). The measurement models were assessed with multilevel confirmatory factor analysis (MCFA) performed with lavaan (Rosseel, 2012). All measurement models tested were homologous and evaluated the same factor structure at the between and within-person levels. Hypothesis 1 was tested by calculating the intra-class correlation coefficient for daily embitterment and by comparing a multilevel intercept only model of embitterment to a single level intercept only model using leave one out cross-validation (Vehtari et al., 2017). All other hypotheses were implemented as multilevel path models in brms (Bürkner, 2017) with random intercepts specified for all endogenous variables (embitterment, affective rumination, psychological detachment, and problem-solving pondering). We implemented two separate models, one with the interaction effects between unreasonable tasks and appreciation from colleagues and supervisors and another with the interactions between unnecessary tasks and the two appreciation constructs. The reason for testing these in separate models was that the interaction terms with unnecessary and unreasonable tasks were created from the same correlated variables, and as a result were highly correlated with each other. A consequence of these high correlations was that the interaction terms undermined the effect of each other, and thus, using them simultaneously would have masked their effect.

For the path analyses we used weakly informative priors as they are flexible enough to allow the data to dominate the results, and at the same time eliminate unreasonable estimates from the analysis. Weakly informative priors have also been shown to be a good choice with smaller sample sizes (McNeish, 2016). For all the regression coefficients we used normal distributions with 0 location and 5 standard deviations for scale. For all the errors at the between and within person levels, we used half-Student-t distributions with 3 degrees of freedom, location 0, and scale 2.5. All models tested converged with 2000 iterations as assessed from visual inspection of traceplots, the potential scale reduction factor being below 1.01, and achieving more than 400 effective sample size for all model parameters.

All predictor and moderating variables were centered to the person mean to reflect within-person variations. We used the posterior distribution to probe the interaction effect (Hypothesis 3 and 5) as simple slopes, and to calculate conditional indirect effects at +/- 1SD of the moderating variables (Wang & Preacher, 2017).

**Results**

**Descriptive Statistics and Measurement Models**

Table 1 presents means, standard deviations, as well as between- and within-person correlations. Multilevel confirmatory factor analyses were performed to test the distinctiveness of the variables assessed with the end of the workday surveys. MCFA results revealed that a model with all eight latent variables [*χ2*(1922)=3910.79, CFI = .824, TLI =.811, RMSEA =.053, AIC = 29731.06] fit the data better than alternative seven-factor models where we combined into a single factor (a) embitterment with affective rumination [*Δχ2* (14) = 755.63, *p*<0.001, *χ2* (1936) = 4166.42, CFI = .737, TLI =.718, RMSEA =.064, AIC = 30458.69], (b) embitterment with detachment [*Δχ2* (14) = 632.47, *p*<0.001, *χ2* (1936) = 4043.27, CFI = .751, TLI =.734, RMSEA =.063, AIC = 30335.54], (c) embitterment with problem-solving pondering [*Δχ2* (14) = 358.11, *p*<0.001, *χ2* (1936) =3768.90, CFI = .784, TLI =.769, RMSEA =.058, AIC = 30961.17], and (d) daily appreciation from colleagues and supervisors (*Δχ2* (14) = 212.74, *p*<0.001, *χ2* (1936) = 3623.53, CFI = .801, TLI =.787, RMSEA =.056, AIC = 29915.80)[[1]](#footnote-1).

**Within-Person Variations in Daily Embitterment**

We expected daily embitterment to exhibit significant within-person variations (Hypothesis 1). The intra-class correlation coefficient, estimated from a Bayesian random intercept model, suggested that 53.3% of the variance in embitterment was attributable to between-person variations. Furthermore, we found that a two-level, null model (i.e., a model with the intercept as the only predictor) fit the data better than a null model with one level [*Δelpdf =* -84.2, SE =19.5]. These results suggest that a significant amount of variance in daily embitterment can be explained by within-person variations thus, supporting Hypothesis 1. Further analyses showed that 53% in unnecessary tasks, 56% in unreasonable tasks, 61% in appreciation from supervisors, 59% in appreciation from colleagues, 54% in affective rumination, 53% in problem-solving pondering, and 53% in detachment, could be explained by between-person variations. Also, in all cases the two-level null model fit the data better than the one-level model. These results align with the use of multi-level analyses to test the study hypotheses.

**Hypothesis Testing**

We evaluated Hypotheses 2 to 5 using two separate Bayesian multilevel models: one for each dimension of ITs. Table 2 shows all the model parameters for unreasonable tasks, and Table 3 shows those corresponding to the analysis for unnecessary tasks.

According to Hypothesis 2, ITs [unreasonable (a) and unnecessary tasks (b)] were expected to relate positively with embitterment. Results (see Tables 2 and 3) revealed that unreasonable tasks related positively and significantly with embitterment in both models (*B* = .21, *95%CI* = [.10: .31], *p* <. 001, Table 2; *B* = .23, *95%CI* = [.12: .34], *p* <. 001, Table 3). However, unnecessary tasks were not significantly related to embitterment (*B* = .00, *95%CI* = [-.09: .10], *p* >.05, Table 2; *B* = .00, *95%CI* = [-.10: -.10], *p* >. 05, Table 3). These results support Hypothesis 2a but not 2b.

Hypothesis 3 concerned the buffering role of appreciation from colleagues and supervisors on the positive relationships between ITs and embitterment. As shown in Tables 2 and 3, appreciation from supervisors did not moderate the relationship between either unreasonable or unnecessary tasks with embitterment. However, there was a significant interaction effect between daily unreasonable tasks and daily appreciation from colleagues (*B* = -.17, *95%CI* = [-.34: -.01], *p* <. 001). Simple slope tests revealed that daily unreasonable tasks related positively with daily embitterment on days when appreciation from colleagues was lower than usual (-1SD, SS = .33, *95% CI* = [.18: .48], *p* < .001), while unreasonable tasks were unrelated to embitterment when appreciation from colleagues was higher than usual (+1SD: SS = .09, *95% CI* = [-.08: .26], *p* > .05; see Figure 1). These results provide partial support for Hypothesis 3.

For Hypothesis 4, daily embitterment was expected to relate positively to (a) affective rumination, and (b) problem-solving pondering, and negatively to (c) psychological detachment. We tested these relationships while controlling for the effects of unreasonable and unnecessary tasks, appreciation from supervisors and colleagues, and their interaction effects. Results revealed that embitterment related positively to affective rumination (*B* = .93, *95%CI* = [.62: 1.25], *p* <. 001, Table 2; *B* = .90, *95%CI* = [.60: 1.21], *p* <. 001, Table 3), and negatively to psychological detachment (*B* = -.95, *95%CI* = [-1.31: -.58], *p* <. 001, Table 2; *B* = -.96, *95%CI* = [-1.31: -.60], *p* <. 001, Table 3), while the relationship between embitterment and problem-solving pondering was not significant (*B* = .21, *95%CI* = [-.11: .54], *p* <. 001, Table 2; *B* = .20, *95%CI* = [-.11 : .53], *p* <. 001, Table 3). Thus, Hypotheses 4a and 4c were supported, but Hypothesis 4b was not. We also conducted a sensitivity analysis and re-evaluated H4 without any of the control variables. Although there were differences in the parameter estimates, the results and pattern of significant effects was identical to those reported here.

Finally, for Hypotheses 5a and 5b we evaluated a series of moderated-mediation effects. These suggested that ITs may relate indirectly to affective rumination, problem-solving pondering and detachment via daily embitterment particularly on days where appreciation from colleagues and supervisors was lower. Results from Hypotheses 2-4 indicate that there is a potential for moderated-mediation for appreciation from colleagues moderating the indirect effects of unreasonable tasks on affective rumination and detachment via embitterment. Indeed, the index of moderated-mediation (Hayes, 2015) was significant for affective rumination (IMM = -.16, *95%CI* = [-.33: -.01], *p* <. 05) and detachment from work (IMM = .16, *95%CI* = [.01: .35], *p* < .05), but not for any of the other indirect effect combinations. For affective rumination, the overall positive indirect effect was significant (Ind = .20, *95%CI* = [.09: .33], *p* <. 001). The conditional indirect effect was positive on days appreciation from colleagues was lower than usual (Cond.Ind = .31, *95%CI* = [.06: .64], *p* <. 001) and non-significant on days appreciation from colleagues was higher than usual (Cond.Ind = .08, *95%CI* = [-.18: .37], *p >*. 05). Similarly, the overall negative indirect effect of unreasonable tasks on detachment via increased embitterment was significant (Ind = -.20, *95%CI* = [-.33: -.09], *p* <. 001). The conditional indirect effect was negative only on days when appreciation from colleagues was lower than usual (Cond.Ind = -.32, *95%CI* = [-.70: -.07], *p* <. 001), and non-significant on days appreciation from colleagues was higher than usual (Cond.Ind = -.08, *95%CI* = [-.38: .21], *p >*. 05). Thus, Hypotheses 5a (i) and 5a (iii) were supported but H5b was not.

**Discussion**

The central aim of this study was to test workplace embitterment as a dynamic state and expand its nomological network, by studying it within SOS theory (Semmer 2007) and the recovery literature (Cropley et al., 2012). This allowed us to understand its proximal antecedents, protective factors, and consequences. Findings indicated that 41% of the variance in embitterment could be attributed to within-person variations, justifying that embitterment is not only an enduring state but also has a dynamic component (Linden et al., 2022). In line with our hypotheses, daily unreasonable (but not unnecessary) tasks related positively to daily embitterment. Importantly, daily appreciation from colleagues mitigates the positive relationship between unreasonable tasks and embitterment, since this relationship was positive only on days employees experienced lower levels of appreciation.  Daily embitterment associated positively with affective rumination (but not to problem solving pondering) and negatively to psychological detachment during off-job hours. Finally, unreasonable tasks related positively to affective rumination and negatively to detachment via increased embitterment but only on days appreciation from colleagues was lower than usual.

**Theoretical Implications**

The findings of this study make some key empirical and theoretical contributions. First, they expand the conceptualisation of workplace embitterment by highlighting that embitterment has both a trait and a state component. The present findings suggest that embitterment may also be perceived as a dynamic state that varies within the same employee from one day to another. Linden (2003) initially defined embitterment as a prolonged emotional situation. Although it has been recently proposed that embitterment may also have a state component (Linden et al., 2022), within-person changes in workplace embitterment have not been studied so far. Hence, this diary study corroborates the dynamic component of embitterment by showing that it fluctuates from one day to another within the same employees as a response to daily work-related experiences and specifically ITs. Recognising that embitterment is also a dynamic phenomenon contributes to the extant literature on embitterment and deepens our understanding of the construct by emphasising its sensitivity to daily stressors. This evidence implies that prolonged embitterment may be developed also because of frequent experiences of daily embitterment, which could result from persistent exposure to unjust events at work (e.g. being assigned unreasonable tasks). This dynamic perspective has significant implication for both theory and practice, as it underscores the importance of addressing daily workplace stressors to prevent the escalation of embitterment into a chronic issue.

Secondly, our findings expand the nomological network of daily workplace embitterment by exploring its antecedents, protective factors, and consequences during off-job hours. Given the hallmark feature of embitterment –that it is triggered by unjust and unfair experiences (Linden, 2003)– previous studies drew up on the organisational justice literature, focusing mostly on the role of specific forms of organisational injustice (e.g., procedural injustice) as precursors of embitterment (e.g., Michailidis & Cropley, 2017; Sensky et al., 2015). However, the studies conducted so far have overlooked what specific work characteristics might elicit embitterment in employees. In this study, we expanded current knowledge by examining embitterment in the context of SOS theory (Semmer et al., 2007), and by introducing the role of ITs as a potential threat that may elicit feelings of embitterment. In line with the main assumptions of SOS theory, ITs are unfair tasks that may vary substantially daily (Eatough et al., 2016) and hence, were considered relevant proximal antecedents of daily workplace embitterment.

Our findings showed that on days employees are assigned tasks that lack justification and feasibility (i.e., unreasonable) they experience higher embitterment. These findings expand previous studies that focused on embitterment in the workplace (e.g., Michailidis & Cropley, 2017; Sensky et al., 2015) by suggesting that, next to perceptions of unfairness and injustice, specific types of tasks that violate justice rules are important antecedents of workplace embitterment. These findings are of high theoretical relevance as they indicate (a) that the source of injustice plays a crucial role in the experience of embitterment and (b) that the agent of embitterment is another person (i.e., the one that delegates unreasonable tasks; Znoj et al., 2016). This is in line with previous findings showing that embitterment is predicted by having an over-controlling supervisor (Michailidis & Cropley, 2017), or a less supportive manager (Sensky et al., 2015). Interestingly, our results suggest that tasks that are considered as pointless and undermine employees’ sense of value at work (i.e., unnecessary) are unrelated to daily embitterment. The fact that only the main effect of unreasonable task on embitterment was significant is an interesting finding that may be explained by the nature and measurement of ITs. Namely, the items measuring unreasonable tasks refer directly to the experience of “unfairness”, and the assignment of such tasks can be perceived by the employee as threat to their self-worth, which is closely related to the experience of embitterment (Pindek et al., 2019). As such, unreasonable tasks appear stronger antecedents of workplace embitterment than unnecessary tasks.

More so, one of the most important theoretical contributions of the current study concerns the factors that may prevent workplace embitterment, which are of relevance when considering the detrimental consequences of this emotional state. In line with SOS theory (Semmer et al., 2007), our findings showed that appreciation from colleagues mitigates the relationship between unreasonable tasks and embitterment, in a way that this relationship was positive only on days appreciation was lower than usual. This finding is also in line with the buffering hypothesis of the JD-R theory (Bakker & Demerouti, 2017), supporting that when resources (i.e., appreciation from colleagues) are available, employees deal more effectively with job demands thus, buffering their unfavorable effects (e.g., embitterment). These results are meaningful as they further support previous evidence on the ability of appreciation to prevent the unfavorable outcomes of ITs (Muntz & Dormann, 2020). Also, these findings have empirical implications for SOS theory, as they suggest that appreciation is an important buffer of the unfavorable consequences of ITs also for a unique emotional reaction, like embitterment. A possible explanation as to why appreciation from colleagues is a more relevant buffer than appreciation from supervisors, is that colleagues are regarded as valuable peer groups, and as such their appreciation might influence how an employee thinks and feels about their job and perceived working conditions, in this case being exposed to ITs (Morrison, 1994). Also, a possible explanation as to why appreciation from supervisors did not have any moderating effect may be because supervisors are usually the people who allocate the ITs in the first place, and as such their appreciation might not buffer the unfavorable consequences of ITs.

With regards to the adverse outcomes of daily embitterment, we tested its association with daily work-related rumination and psychological detachment during off-job time thus, expanding the nomological network of daily embitterment but also the recovery literature. In line with Michailidis and Cropley’s (2017) study on enduring embitterment, our results indicated that daily workplace embitterment relates positively to affective rumination and negatively to psychological detachment during off-job time. Such results are also aligned with Linden’s (2003) clinical observation that embittered individuals “recall the insulting event over and over again” (p.197). Hence, these results provide evidence for the criterion-related validity of workplace embitterment also on a day-level. In line with previous findings (Michailidis & Cropley, 2017), no relationship was found between daily embitterment and problem-solving pondering during leisure. This finding might suggest that the state of embitterment has mostly unfavorable consequences for employees as it is unrelated to any coping attempts. Therefore, employees who experience embitterment at work might not necessarily seek solutions to resolve the source of their experience of embitterment. Furthermore, this study provides support for the perseverative cognition hypothesis (Brosschot et al., 2006) which argues that rumination prolongs the negative experience of an unfavorable event beyond the immediate presence of the stressor. Our findings contribute to understanding the precursors of work-related rumination and impaired recovery by highlighting that embitterment can prevent people from recovering from work as the negative effect of such an emotional state is prolonged even after work.

Finally, findings on indirect moderated-mediation effects shed light on the mechanisms underlying the relationship between ITs and recovery experiences suggesting that on days employees feel embittered because of exposure to unreasonable tasks are more likely to ruminate and less likely to detach from their job during leisure time but only on days appreciation from colleagues is lower than usual. In this way, our study links SOS theory (Semmer, 2007) and the recovery process by highlighting embitterment as an important intervening mechanism and appreciation from colleagues as an important conditional factor.

**Practical Implications**

Findings of the present study highlight some key practical contributions that could guide the development of interventions aiming to prevent workplace embitterment. Firstly, the main practical contribution is to eliminate ITs (and specifically unreasonable tasks), as it is evident that such tasks violate justice perceptions and can have a toll on employees’ emotional wellbeing. This finding underscores the crucial role of supervisors in reducing the assignment of ITs and focusing mostly on the core tasks. Organisational-centered interventions could be designed to train managers on identifying when a task is unreasonable. To this end, there has been an initial attempt to investigate the benefits of a participatory organisational-level workplace intervention aiming at improving psychosocial working environment with a focus on core job tasks (Framke et al., 2018). The results are promising because the effectiveness of such an intervention in protecting against an increase in illegitimate tasks has been supported.

However, in cases where the assignment of ITs is unavoidable, the unfavorable impact of these tasks may be buffered by showing appreciative behaviors. In this study we showed that colleagues take an exceptional position in buffering employees’ unpleasant emotional reactions as a response to tasks that are perceived as unreasonable. Practically, this finding suggests that appreciation from colleagues can be an effective means that can prevent employees who are exposed to unreasonable tasks from being embittered, at least on a daily basis. Organisations can help employees cultivate the skills needed to show appreciation to one another. Acts such as acknowledging one’s accomplishments or recognising one’s hard work can eventually fulfil one’s need for belongingness (Baumeister & Leary, 1995), and as this study suggest, they can also buffer the negative relationship between unreasonable tasks and embitterment. While our findings did not support the buffering effects of appreciation from supervisors, still supervisors need to show appreciation to their subordinates mainly by avoiding delegating ITs.

The present study also highlights the toll daily embitterment can have on employee wellbeing. Findings indicated that experiencing embitterment interferes with an employee’s ability to recover from work as they engage in affective rumination, and they find it difficult to mentally detach from work during leisure. The detrimental consequences insufficient recovery can have on both physical and mental health have been well documented (e.g., Sonnentag et al., 2017; Querstret & Cropley, 2012; Cropley et al., 2017). As such, it is essential that colleagues, supervisors and HR managers are attentive and mindful of possible signs of embitterment and take the necessary means to reduce it.

**Limitations and Future Research**

Although the current study advances our knowledge on the antecedents and consequences of daily workplace embitterment, there were some limitations worth mentioning. One main limitation is the self-report nature of the data. The use of self-reported measures can subsequently lead to some degree of common method variance (Podsakoff et al., 2003). However, measures were taken as an attempt to lessen common method variance, as data were collected at two separate time points (immediately after work and before bedtime) daily. A second limitation is that we collected data two times within each day, which does not allow testing indirect effects in an appropriate manner. Future studies aiming at understanding daily workplace embitterment should incorporate at least three measurement points within each day in order to capture the causal sequence of the examined variables. A further limitation concerns the low mean score of daily embitterment (*M =* 0.34) suggesting that the study participants did not experience high levels of embitterment in their daily lives. Overall, our findings indicate that although embitterment varies within persons, it is not a very common, daily phenomenon at least in our sample.

One of the most significant and novel findings of the present study was the buffering effect of appreciation from colleagues on the link between unreasonable tasks and embitterment. Future research could account for the role of other resources (e.g., social support) in mitigating the unfavorable effects of ITs. Finally, to develop the nomological network of the construct of (daily) embitterment it is important for future research to investigate the incremental validity of workplace embitterment over and above other emotions such as anger or frustration. By looking at the embitterment scale one could argue that it captures emotions, behaviors, physical symptoms as well as the triggers of feelings of embitterment (i.e., unjust events). Future research should further validate the embitterment scale and provide a clearer operationalization of the construct.

**Conclusion**

To conclude, in this diary study, we expanded the nomological network of workplace embitterment by highlighting its dynamic nature and by determining its proximal antecedents and consequences. Employees’ daily experience of embitterment may be elicited on days they deal with more unreasonable tasks than usual. Consequently, embitterment spills over in their private life since it relates to more affective rumination and less detachment. However, this unfavorable sequence of effects takes place only on days appreciation from colleagues is lower than usual. Such insights could be applied in organisations that wish to promote a more legitimate work environment and to protect their employees’ daily wellbeing.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 1**  Means, Standard deviations, and between-person (above the diagonal) and within-person (below-the diagonal) correlations among the study variables (*N* = 71 employees and *N* = 297 measurements occasions). | | | | | | | | | | |
|  | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1.Daily Unnecessary Tasks | 1.86 | 0.75 | - | .73\*\* | .57\*\* | -.40\*\* | -.41\*\* | .72\*\* | .13 | -.49\*\* |
| 2.Daily Unreasonable Tasks | 1.74 | 0.74 | .65\*\* | - | .61\*\* | -.54\*\* | -.49\*\* | .67\*\* | .05 | -.40\*\* |
| 3.Daily Embitterment | 0.34 | 0.51 | .43\*\* | .53\*\* | - | -.42\*\* | -.45\*\* | .73\*\* | .10 | -.41\*\* |
| 4.Daily Appreciation from Supervisors | 4.62 | 1.67 | -.34\*\* | -.45\*\* | -.34\*\* | - | .61\*\* | -.44\*\* | .14 | .36\*\* |
| 5.Daily Appreciation from Colleagues | 5.56 | 1.26 | -.34\*\* | -.36\*\* | -.33\*\* | .59\*\* | - | -.48\*\* | .16 | .41\*\* |
| 6.Daily Affective Rumination | 2.20 | 1.16 | .53\*\* | .57\*\* | .64\*\* | -.39\*\* | -.41\*\* | - | .25\* | -.64\*\* |
| 7.Daily Problem-Solving Pondering | 2.83 | 1.10 | .16\*\* | .01 | .11 | .04 | .04 | .30\*\* | - | -.41\*\* |
| 8.Daily Psychological Detachment | 4.95 | 1.25 | -.37\*\* | -.33\*\* | -.39\*\* | .32\*\* | .36\*\* | -.64\*\* | -.37\*\* | - |

*Note.* \**p* < .05, \*\**p* < .01

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| **Table 2** | | | | | | | | | | | | | | | | |
| The indirect effect of unreasonable tasks on work-related rumination via embitterment (*N* = 71 participants and *N* = 278 occasions) | | | | | | | | | | | | | | | | |
|  | Embitterment | | | | Affective rumination | | | | Detachment | | | | Problem-solving pondering | | | |
|  | *B* |  | CI (95%) | | *B* |  | CI (95%) | | *B* |  | CI (95%) | | *B* |  | CI (95%) | |
| Intercept | 0.35 | \*\*\* | 0.24 | 0.47 | 2.19 | \*\*\* | 1.91 | 2.46 | 4.95 | \*\*\* | 4.66 | 5.25 | 2.84 | \*\*\* | 2.58 | 3.10 |
| Unreasonable Tasks | 0.21 | \*\*\* | 0.10 | 0.31 | 0.25 |  | -0.01 | 0.50 | -0.10 |  | -0.38 | 0.19 | 0.07 |  | -0.19 | 0.34 |
| Unnecessary Tasks | 0.00 |  | -0.09 | 0.10 | -0.01 |  | -0.23 | 0.20 | 0.02 |  | -0.21 | 0.25 | 0.09 |  | -0.12 | 0.32 |
| Appreciation from Supervisors (AbS) | -0.03 |  | -0.09 | 0.03 | -0.07 |  | -0.21 | 0.07 | 0.08 |  | -0.08 | 0.24 | -0.05 |  | -0.20 | 0.09 |
| Appreciation from Colleagues (AbC) | -0.02 |  | -0.09 | 0.05 | -0.10 |  | -0.27 | 0.07 | 0.10 |  | -0.09 | 0.28 | -0.14 |  | -0.31 | 0.04 |
| Unreasonable Tasks × AbS | 0.08 |  | -0.07 | 0.23 | -0.01 |  | -0.35 | 0.33 | -0.22 |  | -0.63 | 0.17 | 0.15 |  | -0.21 | 0.49 |
| Unreasonable Tasks × AbC | -0.17 | \* | -0.34 | -0.01 | 0.04 |  | -0.33 | 0.42 | 0.17 |  | -0.25 | 0.63 | -0.01 |  | -0.39 | 0.37 |
| Embitterment |  |  |  |  | 0.93 | \*\*\* | 0.62 | 1.25 | -0.95 | \*\*\* | -1.31 | -0.58 | 0.21 |  | -0.11 | 0.54 |
| Between-person variance | 0.49 |  | 0.40 | 0.59 | 1.09 |  | 0.90 | 1.33 | 1.18 |  | 0.98 | 1.43 | 0.99 |  | 0.81 | 1.20 |
| Within-person variance | 0.36 |  | 0.32 | 0.40 | 0.81 |  | 0.73 | 0.89 | 0.93 |  | 0.85 | 1.03 | 0.83 |  | 0.76 | 0.92 |
| R2 (within-person) | 0.06 |  | 0.03 | 0.10 | 0.09 |  | 0.06 | 0.13 | 0.07 |  | 0.04 | 0.11 | 0.04 |  | 0.02 | 0.07 |
| *Note*. \**p* < .05, \*\* *p* < .01, \*\*\**p* < .001.  R2 is the Bayesian estimate described by Gelman et al (2019) | | | | |  |  |  |  |  |  |  |  |  |  |  |  |

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| **Table 3** | | | | | | | | | | | | | | | | |
| The indirect effect of unnecessary tasks on work-related rumination via embitterment (*N* = 71 participants and *N* = 278 occasions) | | | | | | | | | | | | | | | | |
|  | Embitterment | | | | Affective rumination | | | | Detachment | | | | Problem-solving pondering | | | |
|  | *B* |  | CI (95%) | | *B* |  | CI (95%) | | *B* |  | CI (95%) | | *B* |  | CI (95%) | |
| Intercept | 0.35 | \*\*\* | 0.22 | 0.48 | 2.19 | \*\*\* | 1.91 | 2.46 | 4.96 | \*\*\* | 4.66 | 5.26 | 2.84 | \*\*\* | 2.59 | 3.09 |
| Unreasonable Tasks | 0.23 | \*\*\* | 0.12 | 0.34 | 0.21 |  | -0.03 | 0.45 | -0.09 |  | -0.37 | 0.19 | 0.05 |  | -0.20 | 0.31 |
| Unnecessary Tasks | 0.00 |  | -0.10 | 0.10 | -0.04 |  | -0.26 | 0.17 | 0.04 |  | -0.21 | 0.30 | 0.06 |  | -0.16 | 0.28 |
| Appreciation from Supervisors (AbS) | -0.03 |  | -0.09 | 0.03 | -0.10 |  | -0.24 | 0.04 | 0.08 |  | -0.08 | 0.24 | -0.06 |  | -0.20 | 0.08 |
| Appreciation from Colleagues (AbC) | -0.03 |  | -0.10 | 0.04 | -0.07 |  | -0.23 | 0.10 | 0.10 |  | -0.10 | 0.29 | -0.13 |  | -0.29 | 0.04 |
| Unnecessary Tasks × AbS | -0.00 |  | -0.16 | 0.16 | 0.18 |  | -0.19 | 0.55 | -0.21 |  | -0.61 | 0.21 | 0.29 |  | -0.10 | 0.67 |
| Unnecessary Tasks × AbC | -0.09 |  | -0.30 | 0.11 | -0.37 |  | -0.80 | 0.08 | 0.18 |  | -0.36 | 0.69 | -0.16 |  | -0.63 | 0.31 |
| Embitterment |  |  |  |  | 0.90 | \*\*\* | 0.60 | 1.21 | -0.96 | \*\*\* | -1.31 | -0.60 | 0.20 |  | -0.11 | 0.53 |
| Between-person variance | 0.49 |  | 0.40 | 0.60 | 1.09 |  | 0.90 | 1.32 | 1.18 |  | 0.97 | 1.43 | 1.00 |  | 0.81 | 1.22 |
| Within-person variance | 0.36 |  | 0.33 | 0.40 | 0.80 |  | 0.73 | 0.88 | 0.93 |  | 0.85 | 1.03 | 0.83 |  | 0.76 | 0.92 |
| R2 (within-person) | 0.06 |  | 0.02 | 0.09 | 0.09 |  | 0.06 | 0.13 | 0.07 |  | 0.04 | 0.11 | 0.04 |  | 0.01 | 0.07 |
| *Note*. \**p* < .05, \*\* *p* < .01, \*\*\**p* < .001.  R2 is the Bayesian estimate described by Gelman et al (2019) | | | | | |  |  |  |  |  |  |  |  |  |  |  |

**Figure 1**

The Proposed Theoretical Model

A diagram of a workflow

Description automatically generated

*Note.* ITs = Illegitimate Tasks

**Figure 2**

*The buffering effect of appreciation from colleagues on the relationship between unreasonable tasks and embitterment.*

A graph with a line

Description automatically generated

1. We were unable to compare the hypothesized 8-factor model to a 7-factor model where unnecessary and unreasonable tasks load on one factor, because this 7-factor mode did not converge. [↑](#footnote-ref-1)