




## RESEARCH ARTICLE

# How and when do frequent daily work interruptions contribute to or undermine daily job satisfaction? A stress appraisal perspective

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**Summary**

This research brings a broad stress appraisal lens to the study of frequent daily work interruptions, offering a unifying theoretical framework to answer why and when work interruptions can engender negative or positive reactions, thereby explaining seemingly contradictory empirical findings. Drawing on cognitive appraisal theory, we propose that frequent interruptions simultaneously trigger hindrance and threat appraisals, which are associated with negative affective reactions (daily negative affect), and challenge appraisal promoting progress toward daily goals (daily work goal progress). These reactions subsequently shape attitudes (daily job satisfaction) later in the day. Furthermore, when an individual appraises frequent interruptions as controllable (i.e., secondary appraisal), they are less likely to view them as a hindrance or threat and more likely to view them as a challenge. Daily diary data from two studies show that frequent work interruptions can elicit hindrance, threat, and challenge appraisals, and threat appraisal is found to increase daily negative affect and undermine daily work goal progress and, thus, daily job satisfaction. In Study 1, interruptions facilitate daily work goal progress. We also discuss the results of secondary appraisal as a moderator. Taken together, our research provides a broad lens of stress appraisal to expand future research on interruptions.

**KEYWORDS**

control appraisal, frequent daily work interruptions, stress appraisal

## 1 | INTRODUCTION

Work interruptions refer to encounters that break the flow of an individual's work (Jett & George, 2003) before a chosen task goal is reached (e.g., Baethge et al., 2015). Most importantly, work interruptions are characterized by their unexpectedness, entail the suspension of an ongoing work task by an external source (hence, the construct is sometimes also referred to as work intrusions; Puranik et al., 2020), and are defined as effort-enhancing due to the additional demands

they impose (Wilkes et al., 2018). When individuals experience more interruptions during a workday, they are likely to feel more stressed because of the greater impact on goal attainment—thus primarily suggesting negative outcomes. In fact, Ma et al. (2020) argued that frequent daily work interruptions will trigger a hindrance appraisal (i.e., viewing a stressor that thwarts expected outcomes as a hindrance) because they “impair goal achievement of the primary task” (Pachler et al., 2018, p. 417). Accordingly, they demonstrated that frequent work interruptions during a workday are positively associated

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with daily hindrance appraisal and, thus, higher psychological distress and lower job performance on the same day. Smith et al. (2022) also reported that daily work interruptions are positively associated with daily hindrance appraisal, which then contributes to regulatory resource depletion. Other studies have also shown that frequent daily work interruptions are associated with lower job satisfaction (e.g., Baethge & Rigotti, 2013; Pachler et al., 2018) and lower perceived task accomplishment (Sonnetag et al., 2018) on the same day.

However, a recent study reported a null effect of frequent daily work interruptions on daily performance (Parke et al., 2018). These results suggest that frequent work interruptions do not necessarily undermine goal achievement and may not always lead to a hindrance appraisal. Furthermore, studies have shown that frequent daily work interruptions are indeed positively associated with positive outcomes such as daily goal facilitation (Hunter et al., 2019) and a sense of belonging (Puranik et al., 2021) on the same day. These findings suggest that work interruptions can intensify one's efforts to complete assigned tasks while providing additional benefits such as demonstrating responsiveness to others' requests (Sonnetag et al., 2018) and bonding with others (Puranik et al., 2021). Such results also reveal positive consequences of work interruptions that cannot be explained by a hindrance appraisal perspective alone. To better understand these seemingly contradictory empirical findings, a unifying theoretical framework is needed to understand why and when work interruptions can engender negative or positive reactions and consequences. As in previous studies (e.g., Hunter et al., 2019; Ma et al., 2020; Parke et al., 2018; Sonnetag et al., 2018), we focus on the frequency of work interruptions during a workday, rather than their specific attributes (e.g., type, modality, duration). This focus on the frequency is practically meaningful for employees' daily work, as it is not uncommon for employees to experience multiple interruptions during a workday (Baethge et al., 2015). Regardless of the specific attributes of each interruption, the more interruptions an individual experiences during a workday, the more problematic it could be for them to achieve their daily goals.

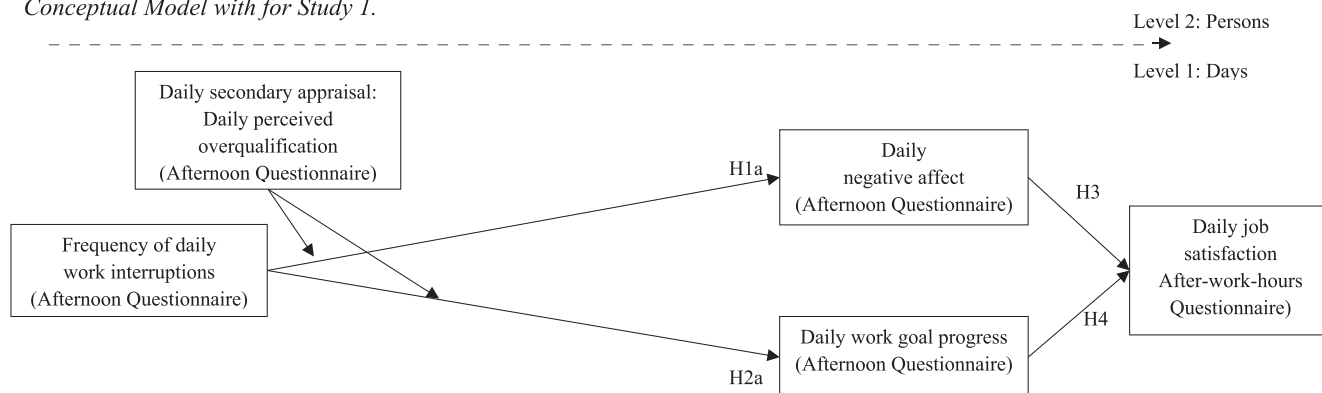
In the present research, we use cognitive appraisal theory (e.g., Folkman, 1984; Lazarus & Folkman, 1984) to unpack how individuals appraise frequent daily work interruptions and how this, in turn, affects employees' daily negative affect, daily work goal progress, and further daily job satisfaction. We use this theoretical framework for two reasons. First, cognitive appraisal theory (e.g., Folkman, 1984; Lazarus & Folkman, 1984) suggests that the same stressful situation can simultaneously elicit different interpretations and thus different appraisals. That is, if individuals experience frequent interruptions during their workday, they may simultaneously experience different appraisals and thus show different reactions. Second, while Ma et al. (2020) only examined the relationship between frequent daily work interruptions and hindrance appraisal, Smith et al. (2022) examined different stress appraisals and reported that daily work interruptions are positively associated with hindrance appraisal, threat appraisal (an appraisal when the stressful situation could lead to personal harm and loss in the future), and challenge appraisal (an appraisal when the stressful situation provides an opportunity for gain). Although Smith et al. (2022) did not examine the

consequences of threat and challenge appraisals, their findings provide preliminary evidence for the need to zoom in on the role of stress appraisals of frequent daily work interruptions in shaping individuals' reactions and outcomes.

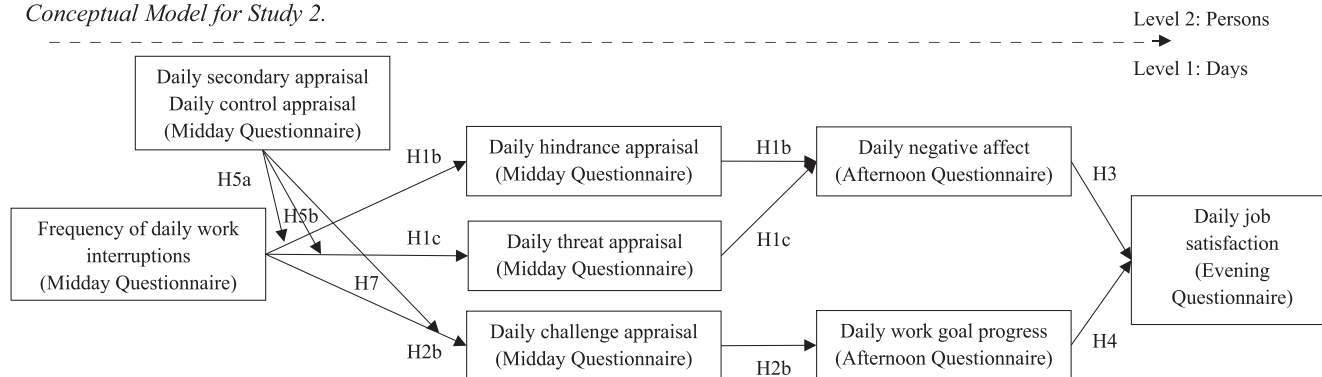
Specifically, cognitive appraisal theory suggests that through the primary appraisal process individuals evaluate the significance of a stressful situation with respect to their well-being. Such appraisals can be further differentiated into harm/loss (or hindrance), threat, and challenge (e.g., Folkman, 1984; Tuckey et al., 2015). Because the theory suggests that the three appraisals are not mutually exclusive, a stressful situation, such as frequent daily work interruptions, may evoke all three appraisals at once. In line with Smith et al. (2022), we therefore argue that frequent daily work interruptions can evoke the three appraisals simultaneously. First, frequent daily work interruptions can evoke a *harm/loss appraisal* (or *hindrance appraisal*) because they thwart expected outcomes with respect to the primary task, as the certain loss of time and effort interferes with the goal attainment of the primary task (e.g., Folkman, 1984; Tuckey et al., 2015). Second, frequent daily work interruptions can evoke a *threat appraisal* owing to the potential for future harm, such as anticipated delays in subsequent tasks and negative personal consequences, such as lower performance ratings (e.g., Folkman, 1984; Tuckey et al., 2015). And, third, frequent daily work interruptions also can elicit a *challenge appraisal* owing to the opportunity for gain, such as demonstrating effectiveness in goal attainment (e.g., Folkman, 1984; Tuckey et al., 2015; see Figure 1 for the conceptual model of our research).

Because frequent daily work interruptions can evoke the three appraisals simultaneously, they will in turn evoke different parallel reactions. According to the literature, hindrance appraisal and threat appraisal are characterized by negative affect (e.g., Folkman, 1984; Lazarus & Folkman, 1984; Tuckey et al., 2015). Building on this, we propose that, because of hindrance appraisal and threat appraisal, frequent daily work interruptions will elicit negative affective reactions during the day (i.e., *daily negative affect*). In contrast, challenge appraisal is characterized by a motivation to approach accomplishment and gain (e.g., Folkman, 1984; Lazarus & Folkman, 1984). Thus, we propose that, because of a challenge appraisal, frequent daily work interruptions will help employees to meet their daily work goals (i.e., *daily work goal progress*). Next, daily negative affect and daily work goal progress—which represent one's affective and behavioral reactions to frequent daily work interruptions—have opposing impacts on *daily job satisfaction*, which is a central evaluation of the overall work experience of the day (e.g., Locke, 1976). We expect daily negative affect to be negatively and daily work goal progress to be positively associated with daily job satisfaction. We focus on daily job satisfaction as an outcome for three reasons. First, job satisfaction varies within individuals and can be affected by various employee experiences during the workday, including frequent daily work interruptions (e.g., Baethge & Rigotti, 2013; Pachler et al., 2018; Puranik et al., 2021). Second, because one's job satisfaction is determined by the discrepancy between what individuals have done and what they should have accomplished (Locke, 1969), it is a desirable outcome to assess the impact of frequent daily work interruptions, particularly through the impact of daily work goal progress. Third, job

## Conceptual Model with for Study 1.



## Conceptual Model for Study 2.



**FIGURE 1** Conceptual model with for Study 1. Conceptual model with for Study 2. Note: H = hypothesis; H1b, H1c, and H2b represent mediation effects. H6a, H6b, and H8 on conditional mediation effects are not included for clarity. For full model information, see Tables 2, 4, 6, and 8.

satisfaction is an indicator of well-being at work (Warr, 1999) and thus a desirable outcome to evaluate the impact of frequent daily work interruptions, especially via the impact of daily negative affect. Overall, job satisfaction is a desirable outcome that allows us to examine both the affective and the behavioral implications of frequent daily work interruptions.

Finally, individuals appraise a stressful situation not only through primary appraisal but also through secondary appraisal, in which they evaluate whether they have the resources to control a stressful situation (Folkman, 1984; Lazarus & Folkman, 1984). Secondary appraisal can occur concurrently with primary appraisal and thus can influence primary appraisals (Folkman, 1984; Lazarus & Folkman, 1984) by acting as a moderator in shaping the link between a stressor and primary appraisals (Liu & Li, 2018; Ma et al., 2020). When an individual appraises the stressful situation as an encounter over which they have control, they are less likely to view it as a hindrance or threat and more likely to view it as a challenge (e.g., Folkman, 1984). Thus, we propose that, when employees have more resources to deal with work interruptions during their workday, frequent daily work interruptions may elicit less hindrance appraisal and threat appraisal but more challenge appraisal. Accordingly, in such a state, frequent daily work interruptions are less strongly related to daily negative affect and are more likely to facilitate daily work goal progress during the day.

We conducted two daily diary studies to test our hypotheses in a complementary fashion (see Figure 1). While Study 1 sheds light on the

affective and behavioral reactions to frequent daily work interruptions in order to disentangle the negative and positive effects of interruptions on daily job satisfaction after work, Study 2 extends this focus by examining in depth the three stress appraisals (hindrance, threat, and challenge appraisals) of frequent daily work interruptions in order to more closely examine the postulated differential effects of these appraisals. In Study 1, we examined the mediation process from the frequency of daily work interruptions, through daily negative affect and daily work goal progress, to daily job satisfaction. For a secondary appraisal, we measured *daily perceived overqualification*, the extent to which an employee perceives that they have more skill, talent, experience, and education (summarized as capabilities) than their specific tasks require for the current workday (e.g., Erdogan & Bauer, 2021; Johnson & Johnson, 1996). The construct captures whether an individual perceives a surplus of capabilities for the day and thus represents a day-specific task-related resource that employees can use to deal with work interruptions during the workday. In Study 2, we examined the mediation process from the frequency of daily work interruptions via hindrance, threat, and challenge appraisals and further daily negative affect and daily work goal progress to daily job satisfaction. For a secondary appraisal, we measured *daily control appraisal* to directly assess one's perceived controllability over the day's work interruptions.

Our research makes several notable contributions to the literature. First, by bringing the broad lens of stress appraisals to understand frequent daily work interruptions, we depart from the dominant

perspective that views work interruptions strictly as a hindrance stressor that can only affect employees negatively (e.g., Ma et al., 2020; Puranik et al., 2020). Consistent with Smith et al. (2022), we suggest that frequent daily work interruptions can elicit different appraisals (hindrance, threat, and challenge). However, we further suggest that different appraisals can lead to different reactions, such as the intensification of daily negative affect and the stimulation of daily work goal progress, which in turn have opposite effects on employees' evaluations of the day (i.e., daily job satisfaction). By applying such a broad stress appraisal perspective to research on work interruptions, we explain why it is possible to find both negative and positive effects of frequent daily work interruptions in the literature and provide a unifying theoretical account for the inconsistent findings in this area as mentioned above.

Second, by examining the moderating effects of daily perceived overqualification and daily control appraisal, our research informs us about the workday characteristics under which frequent daily work interruptions are more or less likely to elicit a specific stress appraisal and thus the consequent reaction. Several studies have identified personal attributes, such as an individual's time-management skills (Ma et al., 2020) or polychronicity (an individual's preference to engage in multiple activities simultaneously; Pachler et al., 2018), as boundary conditions for the effects of daily work interruptions on employee outcomes. In contrast to their focus on personal attributes, our focus on daily perceived overqualification and daily control appraisal suggests that frequent daily work interruptions can vary in their impact across workdays, even for the same individual. This highlights the need for a more fine-grained understanding of the impact of frequent daily work interruptions across workdays (Baethge et al., 2015).

Finally, by examining the impact of frequent daily work interruptions on daily job satisfaction, our studies contribute to the research on frequent daily work interruptions and daily well-being. As one of the most pertinent task-related stressors (e.g., Puranik et al., 2020; Sonnentag & Frese, 2013), work interruptions are a major part of the daily work experience. Therefore, it is important to understand the multifaceted reactions individuals have in terms of their daily well-being when they experience frequent work interruptions during their workday. By contributing to a more detailed understanding of the overall impact of frequent daily work interruptions on daily job satisfaction, this research helps to tease apart why and when frequent work interruptions affect individuals positively or negatively during their day and thus provides guidance on how to manage frequent daily work interruptions accordingly.

## 2 | HYPOTHESIS DEVELOPMENT

### 2.1 | Frequent daily work interruptions and daily negative affect: The mediating role of daily hindrance appraisal and daily threat appraisal

Cognitive appraisal theory suggests that through the primary appraisal process individuals evaluate the significance of a stressful situation, such as experiencing frequent work interruptions during a

workday, in terms of their well-being. Their primary appraisals will then affect how they respond to the situation (e.g., Lazarus & Folkman, 1984). Below, we theorize why frequent daily work interruptions can elicit a hindrance appraisal and a threat appraisal, both of which engender negative emotions.

First, frequent work interruptions can elicit a hindrance appraisal. In the literature, frequent daily work interruptions have been considered hindrance stressors because they impede the completion of the primary task(s) and thus block goal pursuit with regard to these tasks (e.g., Baethge et al., 2015; Puranik et al., 2020). Correspondingly, frequent daily work interruptions can be appraised as hindering, owing to the loss of time and effort with respect to the primary task, and thus as impairing goal attainment (e.g., Cavanaugh et al., 2000; Tuckey et al., 2015). Meanwhile, frequent daily work interruptions also deplete individuals' regulatory resources by requiring them to switch tasks more frequently throughout the day (Baethge et al., 2015; Baumeister et al., 2000). In this way, the loss of regulatory resources could further undermine the quality of work required to perform primary tasks and thus goal attainment for these tasks.

Second, frequent work interruptions can elicit a threat appraisal. Frequent daily work interruptions cause not only harm or loss with respect to primary task goals (i.e., hindrance), as mentioned above, but also potential harm and loss in the foreseeable future, which evokes a threat appraisal. According to cognitive appraisal theory, threat appraisal is concerned with the potential for harm or loss or damage that has not yet occurred but is likely to occur in the future, especially such damage that has personal consequences (e.g., Folkman, 1984; Tuckey et al., 2015). During a workday, individuals may appraise frequent work interruptions as potentially damaging to their overall work progress, because a delay in primary tasks may cause problems in the workflow between coworkers, resulting in negative impressions or reputations. Experiencing frequent work interruptions during the day can also lead to concerns about the quality of one's performance and the possibility of making mistakes due to a lack of cognitive capacity to pay attention to details (e.g., Altmann et al., 2014; Gupta et al., 2013). Both of these may have long-term personal consequences, such as negative performance reviews or loss of opportunities for rewards or promotions. Thus, we expect that frequent daily work interruptions will elicit a threat appraisal due to concerns about potential negative consequences. In line with our reasoning, Smith et al. (2022) reported that daily work interruptions are positively associated with both hindrance appraisal and threat appraisal.

Further, cognitive appraisal theory suggests that both hindrance and threat appraisals are associated with negative emotions. Specifically, hindrance appraisal can elicit negative emotions such as anger, resentment, and frustration owing to the harm to goal attainment (e.g., Lazarus & Folkman, 1984; Searle & Auton, 2015; Tuckey et al., 2015). Threat appraisal can elicit negative emotions owing to concern about potential harm that could occur in the future (e.g., Lazarus & Folkman, 1984; Tuckey et al., 2015), which can elicit emotions such as nervousness, distress, and being upset (Carver & Scheier, 1990). Empirically, both hindrance and threat appraisals have been associated with negative emotions (e.g., Tuckey et al., 2015).

Based on the above considerations and preliminary evidence, we expect that the frequency of daily work interruptions will be positively related to daily negative affect via daily hindrance appraisal and daily threat appraisal. Because the mediating role of daily hindrance appraisal and daily threat appraisal in the relationship between the frequency of daily work interruptions and daily negative affect has not been empirically examined, we propose a formal hypothesis:

**Hypothesis 1.** The frequency of daily work interruptions is positively related to (a) daily negative affect, and this relationship is mediated by (b) daily hindrance appraisal and (c) daily threat appraisal.

## 2.2 | Frequent daily work interruptions and daily work goal progress: The mediating role of daily challenge appraisal

Drawing from cognitive appraisal theory, we further propose that frequent daily work interruptions will also elicit challenge appraisal. Cognitive appraisal theory links challenge appraisal to pressure-laden and stressful situations that still have some positive aspects because of their opportunity for mastery and gain (e.g., Folkman, 1984; Tuckey et al., 2015). With regard to frequent work interruptions during a workday, an individual may appraise them as challenging because such a situation provides an opportunity for gain and mastery by effectively accomplishing the day's tasks despite the frequent interruptions. For example, despite having a direct negative effect on perceived daily task accomplishment, frequent daily work interruptions have been positively associated with perceived responsiveness to others' requests, which in turn contributes to perceived daily task accomplishment (Sonnentag et al., 2018). Frequent daily work interruptions have also been found to be positively and directly associated with daily goal facilitation (Hunter et al., 2019). These findings provide indirect evidence supporting the proposition that frequent work interruptions can be appraised as a challenge in mastering a goal facilitation process. In addition, gaining a sense of belonging through opportunities to interact with other people (Puranik et al., 2021) also contributes to the challenge appraisal of frequent work interruptions. Empirically, Smith et al. (2022) reported that daily work interruptions are positively associated with challenge appraisal.

Viewing a stressful situation as a challenge triggers a motivational force characterized by a sense of eagerness, achievement, and progress (e.g., Cavanaugh et al., 2000; Folkman, 1984), which motivates individuals to exert effort to further work progress (e.g., Cavanaugh et al., 2000). Thus, we expect that daily challenge appraisal of frequent daily work interruptions will be positively related to daily work goal progress. Consistent with this, research linking challenge stressors to positive outcomes shows that they are related to work dedication as an outcome (e.g., Tuckey et al., 2015).

Based on the above considerations, we propose that the frequency of daily work interruptions is positively related to daily work goal progress via challenge appraisal. Because the mediating role of

challenge appraisal in the relationship between the frequency of daily work interruptions and daily work goal progress has not been empirically examined, we propose a formal hypothesis:

**Hypothesis 2.** The frequency of daily work interruptions is positively related to (a) daily work goal progress, and this relationship is mediated by (b) daily challenge appraisal.

## 2.3 | Effects of daily negative affect and daily work goal progress on daily job satisfaction

Next, we propose that daily negative affect contributes to lower daily job satisfaction. Because emotions can influence individuals' attention and evaluations, higher levels of daily negative affect influence evaluations of work events during the day (mood congruency effect, e.g., Rusting & Dehart, 2000). In addition, because emotions can be used as a source of information when making attributions (Schwarz, 2012), individuals may attribute daily negative affect to their work, resulting in lower daily job satisfaction. Empirically, research shows a negative relationship between negative affect and job satisfaction later in the day (e.g., Ilies & Judge, 2002; Judge & Ilies, 2004).

**Hypothesis 3.** Daily negative affect is negatively related to daily job satisfaction.

In contrast, we propose that daily work goal progress contributes to higher daily job satisfaction. Job satisfaction is determined by the degree of discrepancy between what an individual has and what they want to have (Locke, 1976). Thus, the feeling that one is making good progress toward one's goals on a given day is likely to contribute to higher job satisfaction after work on that day (e.g., Diener et al., 1999; Ilies et al., 2007; for preliminary evidence, see Koopman et al., 2016).

**Hypothesis 4.** Daily work goal progress is positively related to daily job satisfaction.

## 2.4 | The moderating role of daily secondary appraisal

Cognitive appraisal theory suggests that "a primary appraisal, whether harm/loss [or hindrance], threat, or challenge, is shaped by an array of person and situation factors" (Folkman et al., 1986, p. 840). These include judgments of control over the stressful situation, or "situational appraisals of control [that] are part of secondary appraisal" (Folkman et al., 1986, p. 842). In other words, the *appraisal about whether individuals have resources to control a stressful situation* may influence primary appraisal processes in any given situation (Folkman, 1984; Lazarus & Folkman, 1984). In fact, several studies have shown that factors reflecting individuals' appraisals of resources

to control stressful situations moderate the relationships between stressors and primary appraisals. For example, individuals' appraisal about their efficacy in performing tasks was found to strengthen the relationship between job complexity and challenge appraisal, while mitigating the relationship between role conflict and hindrance appraisal (Liu & Li, 2018). In the context of daily work interruptions, individuals' general time-management skills, a resource that helps individuals control time pressure, moderate the relationship between daily work interruptions and hindrance appraisal (Ma et al., 2020).

Therefore, we argue that, while frequent daily work interruptions can elicit hindrance, threat, and challenge appraisals and thus different reactions, their strength is determined by how individuals appraise resources to control stressful situations in the workday, that is, *daily secondary appraisal*. In the context of frequent daily work interruptions, individuals' secondary appraisal is likely to capture whether they have sufficient capacity to manage the interrupted tasks during the workday. Because interruptions are stressors at the daily level (e.g., Puranik et al., 2020; Sonnentag & Frese, 2013), we focus on secondary appraisal at the daily level (e.g., de Jonge & Dormann, 2006).

In this research, we first argue that daily secondary appraisal will moderate the relationship between the frequency of daily work interruptions and daily hindrance appraisal and daily threat appraisal and, consequently, daily negative affect and daily job satisfaction. On days when individuals perceive that they have more resources to control their tasks, they are likely to resume their task activities with less difficulty when they encounter frequent daily work interruptions. Moreover, they are less likely to lose time and regulatory resources in completing their work tasks for the day. Daily secondary appraisal will thus weaken the relationship between the frequency of daily work interruptions and daily hindrance appraisal. In addition, on days when they perceive that they have more resources to control their tasks, individuals would be more confident in completing their daily work and less likely to worry about the potential personal consequences if they cannot complete their work tasks for the day. Daily secondary appraisal will thus also weaken the relationship between the frequency of daily work interruptions and daily threat appraisal. Empirically, our reasoning is also consistent with Ma et al.'s (2020) finding that task management skills mitigate the association between frequent daily work interruptions and daily hindrance appraisal. Taken together, then, we suggest that, on days when individuals perceive higher daily secondary appraisal, they have a greater capability to manage frequent daily work interruptions and are thus less likely to appraise frequent daily work interruptions as hindrance or threat.

**Hypothesis 5.** Daily secondary appraisal moderates the positive relationship between frequency of daily work interruptions and (a) daily hindrance appraisal and (b) daily threat appraisal, such that the relationships become weaker as daily secondary appraisal increases.

Based on Hypotheses 1 and 3, we expect that daily secondary appraisal would also moderate the indirect relationship between the frequency of daily interruptions, via daily hindrance appraisal or daily

threat appraisal in a first step and then daily negative affect in a second step, on daily job satisfaction. Specifically, on days when individuals perceive that they have more resources to control their tasks, they are more likely to resume their task activities and less likely to lose time and regulatory resources when they encounter frequent daily work interruptions. Thus, frequent daily work interruptions are less likely to be appraised as a hindrance or threat, and an individual should then experience less daily negative affect. We therefore further argue that, on such days with high daily secondary appraisal, the negative impact of the frequency of daily work interruptions on daily job satisfaction via daily hindrance appraisal or daily threat appraisal and then daily negative affect should be weakened. In contrast, on days when individuals perceive that they have fewer resources to control their tasks, they would be more likely to appraise frequent daily work interruptions as a hindrance and as a threat and thus should experience more daily negative affect and lower daily job satisfaction.

**Hypothesis 6a.** Daily secondary appraisal weakens the indirect (negative) effect of the frequency of daily work interruptions, via daily hindrance appraisal and then daily negative affect, on daily job satisfaction.

**Hypothesis 6b.** Daily secondary appraisal weakens the indirect (negative) effect of the frequency of daily work interruptions, via daily threat appraisal and then daily negative affect, on daily job satisfaction.

We next expect that daily secondary appraisal will strengthen the association between the frequency of daily work interruptions and daily challenge appraisal. Individuals are likely to devote themselves to closing a gap in reaching a goal when they perceive a greater likelihood of achieving that goal (e.g., Klein, 1989). On days when individuals perceive that they have more resources to control their tasks than on other days, they would be more confident in approaching the day's work goals and thus more likely to intensify their efforts when work interruptions occur during the day. This is because they know how to manage the day's tasks and are able to find ways to cope with frequent daily work interruptions, while also enjoying the opportunities that arise from the interruptions to interact with others or to demonstrate their effectiveness in achieving goals. In addition, when individuals know how to manage their tasks and have control over their daily tasks, they can routinize tasks into a new schedule for the day (e.g., Frese & Zapf, 1994), even when they are interrupted. Routinization, in turn, frees up cognitive resources for regulatory processes (Baethge & Rigotti, 2015) and thus may facilitate goal progress on days with higher levels of interruptions.

**Hypothesis 7.** Daily secondary appraisal moderates the positive relationship between frequency of daily work interruptions and daily challenge appraisal, such that the relationship becomes stronger as daily secondary appraisal increases.

Based on Hypotheses 2 and 4, we expect that daily secondary appraisal would also moderate the indirect relationship between frequency of daily interruptions, via daily challenge appraisal in a first step and then daily work goal progress in a second step, on daily job satisfaction. Specifically, on days when individuals perceive that they have more resources to control their tasks, they are likely more able to find ways to cope with frequent daily work interruptions, while also enjoying the opportunities that arise from the interruptions. Thus, frequent daily work interruptions are more likely to be appraised as a challenge and an individual should then be more likely to experience daily work goal progress. We therefore further argue that on such days with high daily secondary appraisal, the positive impact of frequency of daily work interruptions on daily job satisfaction via daily challenge appraisal and then daily work goal progress should be strengthened. In contrast, days when individuals perceive that they have less resources to control their tasks, they would be less likely to appraise frequent daily work interruptions as challenge and are thus less likely to experience daily work goal progress and higher daily job satisfaction.

**Hypothesis 8.** Daily secondary appraisal strengthens the indirect (positive) effect of the frequency of daily work interruptions, via daily challenge appraisal and then daily work goal progress, on daily job satisfaction.

## 2.5 | Overview of studies

We conducted two daily diary studies to test our hypotheses in a complementary fashion. Study 1 was a daily diary study over 10 working days with two daily questionnaires. We examined the role of the frequency of daily work interruptions, via daily negative affect and daily work goal progress (all measured in “the afternoon questionnaire”), in shaping daily job satisfaction measured after work (measured in “the after-work-hours questionnaire”). In addition, we used daily perceived overqualification (measured in the afternoon questionnaire), the extent to which an employee perceives that they have more capabilities than their specific tasks require for the current workday (e.g., Erdogan & Bauer, 2021; Johnson & Johnson, 1996), to capture daily secondary appraisal.

Although Study 1 sheds light on the negative and positive reactions to frequent daily work interruptions and their impact on daily job satisfaction after work, it did not directly measure daily hindrance, threat, and challenge appraisals of the frequency of daily work interruptions. To address this, we conducted Study 2 and improved the research design in three ways. First, we included the three stress appraisals (hindrance, threat, and challenge) of the frequency of daily work interruptions to fully test our proposed hypotheses. Second, instead of using daily perceived overqualification, which does not directly capture individuals' sense of control over daily work interruptions, we measured individuals' daily control appraisal, that is, their perceived controllability over daily work interruptions to capture daily

secondary appraisal. Third, we used three daily questionnaires over five working days to avoid measuring different variables at the same time (Podsakoff et al., 2003). Specifically, we measured the frequency of daily work interruptions, daily hindrance, threat, and challenge appraisals, as well as daily control appraisal at midday (“the midday questionnaire”), daily negative affect and daily work goal progress in the afternoon (“the afternoon questionnaire”), and then daily job satisfaction in the evening (“the evening questionnaire”).

In both studies, we focused on a within-subject design to study the effects of the frequency of daily work interruptions with the intention of obtaining employees' “lived-through experience” (Weiss & Rupp, 2011, p. 87). Psychological theories and phenomena are often specified in terms of how events and related perceptions lead to subsequent behaviors and reactions as within-person phenomena (Beal, 2015). Similarly, cognitive appraisal theory (e.g., Lazarus & Folkman, 1984) theorizes how an individual experiencing a stressful situation, such as frequent daily work interruptions, may appraise this situation and thus subsequently behave and react to the specific situation. Consequently, our study design reflects the proposed within-person processes that are fundamental to providing evidence relevant to the theory (Gabriel et al., 2018; McCormick et al., 2020).

## 3 | STUDY 1

### 3.1 | Sample and procedures

Employees from the German-speaking part of Switzerland were recruited through the human resources departments of both private and public organizations. We also advertised the study through newspaper articles, LinkedIn, and Facebook. We assured employees interested in the study that their respective employers would not have access to the data collected and that all data would be used for research purposes only and would be published only after being anonymized so that it would not be possible to draw conclusions about individual participants. Employees who participated in the study were offered feedback on their study results; additionally, upon study completion, participants were entered into a drawing to win one of five wellness day vouchers. After consenting to participate in the study, participants were screened to ensure that they were at least 18 years old and worked at least 4 days per week. We did not include participants who were self-employed or who only worked on the side (e.g., Ohly et al., 2017). If participants met these requirements, we then collected demographic information with a general survey.

Participants received the two daily online surveys Monday through Friday for 2 weeks (=10 days). Email invitations for the afternoon questionnaire were sent out at 3:00 PM, and participants were asked to complete the questionnaire as soon as they had time, while they were still at work. We chose this time for the afternoon questionnaire based on a pilot study we conducted with an independent sample of 334 participants on when employees tended to start their

**TABLE 1** Means, standard deviations, and correlations of variables for Study 1.

Variables	M	SD <sub>b</sub>	SD <sub>w</sub>	$\alpha$	ICC	1	2	3	4	5
1. Frequency of daily work interruptions	4.16	1.04	1.28	.76	.40	—	-.10**	.12**	.10**	.00
2. Daily perceived overqualification	3.73	0.96	0.71	.65	.65	.02	—	-.05	-.10**	-.06*
3. Daily negative affect	2.21	0.70	0.61	.79	.57	.18*	.06	—	-.18**	-.23**
4. Daily work goal progress	5.01	0.67	0.88	.87	.37	-.07	-.12	-.54**	—	.46**
5. Daily job satisfaction	5.23	0.64	0.89	—	.35	-.20*	-.07	-.57**	.80**	—

Note: Means, standard deviations at the between-person ( $SD_b$ ) and within-person level ( $SD_w$ ), and Cronbach's alpha at the within-person level are displayed. Above the diagonal are correlations at the within-person level ( $N = 1485$ ); below the diagonal are correlations at the between-person level ( $N = 213$ ).

Abbreviation: ICC, intraclass correlation.

\* $p < .05$ , and \*\* $p < .01$ .

workday.<sup>1</sup> Similarly, about two thirds of their workday had elapsed by the time participants in Study 1 completed the afternoon questionnaire<sup>2</sup>; this allowed participants enough time to make valid assessments of their level of the frequency daily work interruptions and perceived overqualification for the current workday, which is consistent with the frequency approach chosen for this study (e.g., Koopman et al., 2016; Puranik et al., 2021). Invitations for the after-work-hours questionnaire were sent out at 5:00 PM and participants were asked to complete this questionnaire after finishing work and when they were no longer at work.

Initially, 271 participants registered for the study and 259 completed the general survey. For the subsequent daily diary survey, we excluded questionnaires from days on which participants reported that they were not working, as this implied that they could not provide meaningful responses to the items assessing daily work interruptions and daily perceived overqualification. To control for careless responding, we excluded any daily questionnaires that were completed on the wrong day, or in the wrong order (i.e., the after-work-hours questionnaire was completed before the afternoon questionnaire; Sonntag et al., 2008). Moreover, we excluded data from days when the after-work-hours questionnaire was completed less than 25 min after the afternoon questionnaire (e.g., Debus et al., 2014), and we also excluded participants who had responded on fewer than 3 days of the diary period (for a similar approach see Venz et al., 2018). This procedure resulted in a final dataset of 213 individuals.<sup>3</sup> Of the potential 2130 reporting days (213 participants  $\times$  10 days), participants submitted a total of 1485 afternoon questionnaires (completion rate of 69.72%) and

a total of 1370 after-work-hours questionnaires (completion rate of 64.32%). Participants were on average 41.41 years old ( $SD = 11.39$ ), which reflects the demographics of the Swiss working population (in 2021, the average age was 42.1 years, Swiss Federal Statistical Office, 2021b). Overall, 55.87% of participants were female (compared to 46.86% in the Swiss working population for 2021, Swiss Federal Statistical Office, 2021a). Most participants worked in the tertiary sector (service sector: 91.55%; secondary sector/manufacturing: 8.45%), which is not surprising given that over 75% of all employees in Switzerland work in the tertiary sector (Swiss Federal Statistical Office, 2022). Participants had an average of 16.08 years of education ( $SD = 3.26$ ), with many participants (31.46%) holding a university degree.

## 3.2 | Measures

All variables were measured on a 7-point rating scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Table 1 shows means, standard deviations, intraclass correlations (ICCs), multilevel within-level alphas for reliability (Geldhof et al., 2014), and multilevel correlations for all Study 1 variables.<sup>4</sup> We additionally controlled for study week (week one = 0; week two = 1) in our analysis to account for any potential priming effects from repeating surveys over 2 weeks (e.g., Gabriel et al., 2018).

### 3.2.1 | Afternoon questionnaire

#### *Frequency of daily work interruptions*

We measured frequency of daily work interruptions with two items from Semmer et al.'s (1999) scale (example item: "Today I was interrupted at work by supervisors, colleagues, employees, or customers").

<sup>1</sup>In this pilot study, we asked the participants ( $N = 334$ ) what time a typical workday started for them. In total, 18.10% reported that their typical workday started around 6 AM, 26.07% reported that their typical workday started around 7 AM, and 35.28% reported that their workday started around 8 AM. This means that nearly 50% of employees had completed more than half of a typical 8-h workday by noon, while nearly 80% had completed at least half of their workday by noon.

<sup>2</sup>In total, 15.02% of participants in Study 1 started work on a typical working day between 6 and 7 AM, 61.03% started between 7 and 8 AM, and 19.72% started between 8 and 9 AM, leaving only around 3% starting work at 9 AM or later. Participants in Study 1 completed the afternoon questionnaire on average at 3:40 PM, which is also consistent with the assumption that approximately two thirds of the working day had elapsed by the time participants started this questionnaire.

<sup>3</sup>To examine whether systematic differences existed between employees in the final sample ( $N = 213$ ) versus employees who only completed the general survey and were not in the final sample ( $N = 46$ ), we conducted t-tests on demographic variables. Results showed no differences between the two groups in terms of age, gender, or years of education.

<sup>4</sup>The Appendix S1 (see Table S1; [https://osf.io/3fgqr/?view\\_only=5b900fd81cea4d8e929db3291efbb34](https://osf.io/3fgqr/?view_only=5b900fd81cea4d8e929db3291efbb34)) also provides a detailed overview of all instructions, scales, and corresponding items used to measure the variables. Table S1 also details our strategies to shorten the scales for Study 1, in line with literature recommendations to reduce participant burden in diary studies due to the large number of questionnaires (e.g., Gabriel et al., 2018). In addition, we conducted a validation study of the shortened daily diary measures for Study 1, which is also reported in the Appendix S1 (see Table S1).

### Daily perceived overqualification

To capture daily secondary appraisal, we measured daily perceived overqualification with the 4-item perceived mismatch scale by Johnson and Johnson (1996), adapted from Khan and Morrow (1991), adapted to day-specific assessment (example item: “My formal education overqualified me for my tasks at work today”).

### Daily negative affect

We measured daily negative affect with 6 items from the Positive and Negative Affect Scale (PANAS; Watson et al., 1988; example items: “distressed,” “upset”).

### Daily work goal progress

We measured daily work goal progress with three items from a scale by Koopman et al., 2016, adapted from a job search progress scale by Wanberg et al., 2010 (example item: “Today, I have been productive”).

## 3.2.2 | After-work-hours questionnaire

### Daily job satisfaction

Daily job satisfaction was measured with one item from the Michigan Organizational Assessment Questionnaire—Job Satisfaction Subscale (MOAQ-JSS; Cammann et al., 1983) adapted to day-specific assessment (item: “Today, I am satisfied with my job”).

## 3.2.3 | Construct validity

To ensure that we were measuring distinct constructs, we conducted multilevel confirmatory factor analyses (mCFAs) using Mplus 8 (Muthén & Muthén, 1998–2017). We estimated factor structures for the constructs for both the within-person and the between-person levels within a model, thereby accounting for the nested structure of the data (i.e., daily measures nested within individuals; Gabriel et al., 2018; Geldhof et al., 2014). For the proposed four-factor model ( $M_0$ ), frequent daily work interruptions, daily perceived overqualification, daily negative affect, and daily work goal progress were all loaded onto their respective separate factors; we also included daily job satisfaction, measured with one item, as a covariate in all measurement models. This model,  $M_0$ , fitted the data better than any of the alternative models. A detailed overview of the model comparisons can be found in Table S2.<sup>5</sup>

## 3.3 | Analytic strategy

Owing to the nested data structure (i.e., days nested within persons), we used a multilevel approach with the Mplus 8 software (Muthén & Muthén, 1998–2017) for hypothesis testing. We employed a full information maximum likelihood estimation, which allows all available

data to be used in the estimation of each parameter. This allowed participants who did not complete all of the after-work-hours questionnaires to still provide useful data (Enders & Bandalos, 2001).

To test the effects between the frequency of daily work interruptions and daily negative affect (Hypothesis 1a) and daily work goal progress (Hypothesis 2a), as well as the effects from daily negative affect and daily work goal progress to daily job satisfaction after work (Hypotheses 3 and 4, respectively), we estimated a multilevel mediation model with fixed effects: We regressed daily negative affect and daily work goal progress (i.e., the mediators) on the frequency of daily work interruptions and daily perceived overqualification (i.e., the main effect of the moderator) at the within-person level; daily job satisfaction (i.e., the outcome) was regressed on daily negative affect, daily work goal progress, frequency of daily work interruptions, and daily perceived overqualification at the within-person level. In addition, we controlled for the effects of the study week on all mediators and the outcome. Following the recommendations of Enders and Tofighi (2007), we centered the predictor (frequency of daily work interruptions), the moderator (daily perceived overqualification), and the mediator variables (daily negative affect and daily work goal progress) at their respective person means. By applying person-mean-centering, we removed all variance caused by between-person differences in order to focus on within-person variation.

## 3.4 | Results

### 3.4.1 | Hypotheses testing

The results of the mediation model are presented in Table 2. Hypothesis 1a was supported, such that an individual having more frequent daily work interruptions was related to higher daily negative affect ( $\gamma = .054$ ,  $z = 3.321$ ,  $p = .001$ ). Next, we also found support for Hypothesis 2a in that an individual having more frequent daily interruptions at work was related to higher daily work goal progress ( $\gamma = .063$ ,  $z = 2.642$ ,  $p = .008$ ). Further, an individual's higher daily negative affect was related to lower daily job satisfaction ( $\gamma = -.216$ ,  $z = -4.943$ ,  $p < .001$ ), supporting Hypothesis 3. An individual's higher daily work goal progress was related to higher daily job satisfaction ( $\gamma = .435$ ,  $z = 12.975$ ,  $p < .001$ ), supporting Hypothesis 4.

### 3.4.2 | Supplemental analyses

To fully understand the results of Study 1, we conducted additional analyses. First, the conceptual model for Study 1 implies that the frequency of daily work interruptions is related to daily negative affect and daily work goal progress and through these to daily job satisfaction after work. We therefore estimated indirect effects between frequency of daily work interruptions and the outcome daily job satisfaction, via daily negative affect and daily work goal progress (see Table 3). We obtained 95% Monte Carlo confidence intervals (MC CIs) for the indirect effects using 20 000 bootstrap samples

<sup>5</sup>Appendix S1: [https://osf.io/3fgqr/?view\\_only=5b900fd81cea4d8e929dbc3291efbb34](https://osf.io/3fgqr/?view_only=5b900fd81cea4d8e929dbc3291efbb34)

TABLE 2 Unstandardized coefficients of the mediation model for Study 1.

Variables	Daily negative affect		Daily work goal progress		Daily job satisfaction	
	Estimate	SE	Estimate	SE	Estimate	SE
Mean					5.229**	.058
<i>Control variable</i>						
Study week <sup>a</sup>	-.022	.020	.085**	.027	.011	.048
<i>Independent variables</i>						
Frequency of daily work interruptions	.054**	.016	.063**	.024	-.022	.021
Daily perceived overqualification	-.033	.028	-.119**	.042	-.036	.034
<i>Mediators</i>						
Daily negative affect	—		—		-.216**	.044
Daily work goal progress	—		—		.435**	.033
<i>Residual variances (within)</i>						
	.314**	.025	.652**	.040	.596**	.044
<i>R<sup>2</sup> (within)</i>						
	.016	.008	.023*	.010	.192**	.024

Abbreviation: SE, standard error.

<sup>a</sup>For study week: week one = 0; week two = 1.

\* $p < .05$ , and \*\* $p < .01$ .

(Preacher & Selig, 2012). Consistent with the results above, both daily negative affect (indirect effect =  $-.012$ , 95% MC CI:  $[-.020, -.005]$ ) and daily work goal progress (indirect effect =  $.027$ , 95% MC CI:  $[.007, .048]$ ) mediated the opposing relationships between daily work interruptions and daily job satisfaction.

Second, to test the moderating effect of daily perceived overqualification as a proxy for daily secondary appraisal on the relationship between frequency of daily work interruptions and daily negative affect and daily work goal progress, we estimated a multilevel moderation model. To do so, we computed a moderation model that included an interaction between the frequency of daily work interruptions and daily perceived overqualification (i.e., person-mean centered frequency of daily work interruptions  $\times$  person-mean centered daily perceived overqualification; Liu et al., 2012) as a predictor of daily negative affect and daily work goal progress. The results of the moderation model are shown in Table 4. The results indicated that the interaction between frequent daily work interruptions and daily perceived overqualification was significantly related to daily negative affect ( $\gamma = -.049$ ,  $z = -2.819$ ,  $p = .006$ ). A simple slope analysis (see Figure 2) revealed that, on days when employees' perceived overqualification was low (1 SD below the within-sample mean for daily perceived overqualification), the frequency of daily work interruptions was significantly related to higher daily negative affect ( $\gamma = .085$ ,  $t = 4.314$ ,  $p < .001$ ). However, on days when employees' perceived overqualification was high (1 SD above the within-sample mean for daily perceived overqualification), the frequency of daily work interruptions was not related to daily negative affect ( $\gamma = .021$ ,  $t = 1.041$ ,  $p = .299$ ). Further, although not hypothesized, conditional indirect effects and corresponding differences are presented in Table 3. Finally, the interaction between frequent daily work interruptions and

daily perceived overqualification was not significantly related to daily work goal progress ( $\gamma = .054$ ,  $z = 1.899$ ,  $p = .058$ ).

Third, we examined whether the frequency of daily work interruptions might have nonlinear effects on daily negative affect and daily work goal progress, as frequent daily work interruptions beyond a certain point might lead to a ceiling effect or include an inflection point in their relationship with individuals' reactions. We ran a series of models (mediation and moderation models, see Appendix S1<sup>6</sup> Tables S3a and S3b) that included quadratic effects between the frequency of daily work interruptions and the mediators. While the linear effects remained the same as reported above, we additionally found a quadratic relationship between the frequency of daily work interruptions and daily work goal progress ( $\gamma = -.032$ ,  $z = -2.845$ ,  $p = .004$ ; see Appendix S1,<sup>7</sup> Table S3a, for the mediation model and Figure S1) for the overall relationship between the frequency of daily work interruptions and daily work goal progress for different values of the predictor when quadratic effects are included. Analysis of the overall slope for different values of the frequency of daily work interruptions (i.e. predictor; Hayes & Preacher, 2010) indicated that, when the frequency of daily work interruptions was low (1 SD below the within-sample mean for the frequency of daily work interruptions), the frequency of daily work interruptions was overall positively related to daily work goal progress ( $\gamma = .113$ ,  $z = 3.436$ ,  $p = .001$ ), whereas when the frequency of daily work interruptions were high (1 SD above the within-sample mean for the frequency of daily work interruptions), the frequency of daily work interruptions was overall not related to daily work goal progress ( $\gamma = -.019$ ,  $z = -0.580$ ,  $p = .562$ ).

Finally, we also conducted further robustness checks by running a series of models to examine the effects of control variables. Overall, the results from the various models (see Tables S4a–S5b<sup>8</sup>) led to the same conclusions as those reported above.

<sup>6</sup>See note 5.

<sup>7</sup>See note 5.

<sup>8</sup>See note 5.

**TABLE 3** Indirect effects based on the mediation model and conditional indirect effects based on the moderation model for Study 1.

Variables	Indirect effect	
	Estimate	Bias-corrected 95% MC CI <sup>a</sup>
Frequency of daily work interruptions → <i>daily negative affect</i> → daily job satisfaction		
Mediation model: Indirect effects	-.012	[-.020; -.005]
Moderation model: Conditional indirect effects		
High daily perceived overqualification (HDOQ)	-.004	[-.014; .004]
Low daily perceived overqualification (LDOQ)	-.018	[-.030; -.009]
Difference between HDOQ and LDOQ conditions	.014	[.004; .026]
Frequency of daily work interruptions → <i>daily work goal progress</i> → daily job satisfaction		
Mediation model: Indirect effects	.027	[.007; .048]
Moderation model: Conditional indirect effects		
High daily perceived overqualification (HDOQ)	.044	[.016; .073]
Low daily perceived overqualification (LDOQ)	.013	[-.011; .037]
Difference between HDOQ and LDOQ conditions	.031	[-.001; .064]

Abbreviation: MC CI, Monte Carlo confidence interval.

<sup>a</sup>We obtained 95% Monte Carlo CIs using 20 000 bootstrap samples (Preacher & Selig, 2012). Significant CIs are in bold.

**TABLE 4** Unstandardized coefficients of the moderation model for Study 1.

Variables	Daily negative affect		Daily work goal progress		Daily job satisfaction	
	Estimate	SE	Estimate	SE	Estimate	SE
Mean					5.229**	.058
Control variable						
Study week <sup>a</sup>	-.024	.002	.087**	.028	.011	.049
Independent variables						
Frequency of daily work interruptions	.053**	.016	.065**	.024	-.022	.021
Daily perceived overqualification	-.035	.028	-.116**	.042	-.036	.034
Mediators						
Daily negative affect	—		—		-.216**	.044
Daily work goal progress	—		—		.454**	.033
Interaction						
Frequency of daily work interruptions × Daily perceived overqualification	-.049**	.017	.054	.029	—	
Residual variances (within)						
	.313**	.024	.650**	.040	.596**	.044
R <sup>2</sup> (within)	.021*	.009	.026*	.011	.192**	.024

Abbreviation: SE, standard error.

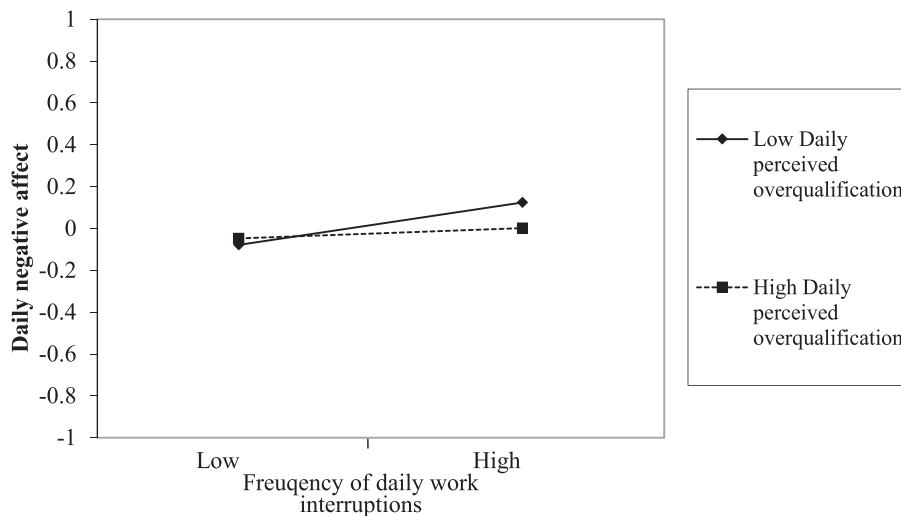
<sup>a</sup>For study week: week one = 0; week two = 1.

\* $p < .05$ , and \*\* $p < .01$ .

### 3.5 | Discussion

The results of Study 1 suggest that frequent daily work interruptions can trigger higher daily negative affect while facilitating higher daily work goal progress (albeit up to a certain level), thus having opposite effects on daily job satisfaction. Furthermore, on days when employees perceive that they have a surplus of capabilities to complete their tasks, frequent daily work interruptions are less likely to elicit daily negative affect than on other days. In general, the results of Study 1 are consistent with our reasoning based on cognitive appraisal theory.

Although Study 1 shows interesting results, it also leaves some unanswered questions. First, we did not measure hindrance, threat, and challenge appraisals of frequent daily work interruptions. Whether the observed results are due to effects of appraisals is unknown. Second, while it is appropriate to use daily perceived overqualification to capture individuals' daily resources in performing daily tasks as an indicator of daily secondary appraisal, daily perceived overqualification does not directly measure the appraisal of whether employees are able to control daily tasks. Third, in this study with two daily questionnaires, we measured the frequency of daily work interruptions, daily negative affect, and



**FIGURE 2** Moderating effect of daily perceived overqualification on the relationship between frequency of daily work interruptions and daily negative affect in study 1. Note: Negative values of daily negative affect are due to person-mean centering. Low daily perceived overqualification: days when employees' perceived overqualification was 1 SD below the within-sample mean for daily perceived overqualification. High daily perceived overqualification: days when employees' perceived overqualification was 1 SD above the within-sample mean for daily perceived overqualification.

daily work goal progress within the same questionnaire, which did not help us examine the hypothesized directional impact of the effects of the frequency of daily work interruptions on daily negative affect and daily work goal progress. Thus, there was a need to conduct a daily diary study with three daily questionnaires to measure the frequency of daily work interruptions and different appraisals, their reactions (i.e., daily negative affect and daily work goal progress), and the final outcome of daily satisfaction all separately. Finally, we shortened some of the scales used in this study. Daily diary studies require repeated assessments of constructs at very short intervals. Therefore, participant burden is a concern, and the use of extremely efficient and short measures becomes a necessity. Despite this necessity, the use of shortened scales has potential drawbacks regarding the psychometric properties of these scales.

To address these issues, we conducted Study 2 with three daily questionnaires over five working days. In addition, in Study 2, we measured all three appraisals of frequent daily work interruptions. For a more fine-grained examination of the moderating effect of daily secondary appraisal, we measured daily control appraisal to capture perceived controllability over the daily tasks. Regarding measurement, we used full scales to measure the constructs in Study 2, except for the construct of frequency of daily work interruptions, where we removed one item to purify the measure according to the construct definition as in Study 1.

## 4 | STUDY 2

### 4.1 | Sample and procedures

German employees were recruited through an existing online panel (for a similar approach, see Debus et al., 2019).<sup>9</sup> Employees who participated in the study were offered monetary compensation of up to €9.75 through the panel provider. After participants gave their consent to participate in the study, we screened participants to ensure that they were at least 18 years old and worked 5 days a week. We did not include

participants who were self-employed or who only worked on the side (e.g., Ohly et al., 2017). If participants met these requirements, we then collected demographic information with a general survey.

Participants received the three daily online surveys for five working days (i.e., Monday through Friday) over the course of 1 week. Email invitations to the midday questionnaire were sent out at noon (12:00 PM), and participants had a 2-h window (12:00 to 2:00 PM) to complete the midday questionnaire. We chose this time for the midday questionnaire because, based on results from the pilot study,<sup>10</sup> approximately half of the workday had elapsed by that time. This allowed participants enough time to make valid assessments of their level of frequent daily work interruptions and control appraisal for the workday, which is consistent with the frequency approach chosen for this study.<sup>11</sup> Invitations for the afternoon questionnaire were sent out at 3:00 PM, and participants were given a 2-h window (3:00 to 5:00 PM) to complete the afternoon questionnaire. Invitations for the evening questionnaire were sent out at 6:00 PM, and participants had the rest of the evening, until 11:59 PM, to complete this questionnaire.

To control for careless responses, we screened out 47 participants who failed the attention check in the middle of the general survey (i.e., the item asking participants to tick a specific response). A total of 410 participants completed the general survey for Study 2. For the subsequent daily diary survey, participants were excluded for days where they reported that they were not working, as this implied that they could not provide meaningful responses to the items assessing frequent daily work interruptions. In the end, 286 individuals participated in the daily diary survey.<sup>12</sup> Of the potential 1430 reporting days (286 participants  $\times$  5 days), participants submitted a total of 1019 midday questionnaires (completion rate of 71.51%), a total of 857 afternoon questionnaires (completion rate of 60.14%), and a total

<sup>10</sup>See note 1.

<sup>11</sup>Participants in Study 2 started work on average between 7 and 8 AM. The midday questionnaire was completed on average at 12.38 PM. ( $SD = 33$  min). This means that, on average, at least half of a typical working day had elapsed by the time the midday questionnaire was filled out.

<sup>12</sup>To examine whether systematic differences existed between employees in the final sample ( $N = 286$ ) versus employees who only completed the general survey and were not in the final sample ( $N = 124$ ), we conducted  $t$ -tests on demographic variables. Results showed no differences between the two groups in terms of age or gender.

<sup>9</sup>For further information on this company, see [www.bilendi.com](http://www.bilendi.com).

**TABLE 5** Means, standard deviations, and correlations of variables for Study 2.

Variables	M	SD <sub>b</sub>	SD <sub>w</sub>	$\alpha$	ICC	1	2	3	4	5	6	7	8
1. Frequency of daily work interruptions	3.34	1.07	1.43	.79	.36	—	-.22**	.50**	.51**	.36**	.14**	-.14**	-.13**
2. Daily control appraisal	5.45	0.79	0.79	.53	.52	-.43**	—	-.23**	-.23**	.00	-.12*	.23**	.24**
3. Daily threat appraisal	2.63	1.11	1.06	.90	.52	.68**	-.69**	—	.73**	.19**	.20**	-.19**	-.19**
4. Daily hindrance appraisal	2.64	1.09	1.03	.92	.53	.70**	-.71**	.95**	—	.22**	.17**	-.17**	-.16**
5. Daily challenge appraisal	2.86	0.99	0.99	.87	.50	.32**	-.25**	.24**	.33**	—	.03	-.04	-.00
6. Daily negative affect	1.96	0.89	0.59	.87	.69	.43**	-.67**	.69**	.66**	.32**	—	-.33**	-.33**
7. Daily work goal progress	5.18	0.74	0.90	.85	.40	-.27**	.63**	-.53**	-.51**	-.08	-.61**	—	.49**
8. Daily job satisfaction	5.40	1.03	0.78	.67	.64	-.34**	.55**	-.63**	-.56**	.06	-.63**	.77**	—

Note: Means, standard deviations at the between-person ( $SD_b$ ) and within-person level ( $SD_w$ ), and Cronbach's alpha at the within-person level are displayed. Above the diagonal are correlations at the within-person level ( $N = 1019$ ); below the diagonal are correlations at the between-person level ( $N = 286$ ).

Abbreviation: ICC, intraclass correlation.

\* $p < .05$ , and \*\* $p < .01$ .

of 925 evening questionnaires (completion rate of 64.91%). Participants were on average 40.48 years old ( $SD = 9.82$ ), reflecting the demographics of Study 1. A total of 48.25% of the participants were female. Most participants worked in the tertiary sector (service sector, 77.27%; secondary sector/manufacturing, 21.68%; three participants indicated “other”). Most participants had a vocational degree (30.07%) followed by a university degree (17.48%).

## 4.2 | Measures

All variables were measured on a 7-point rating scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Table 5 shows means, standard deviations, ICCs, multilevel within-level alphas for reliability (Geldhof et al., 2014), and multilevel correlations for all Study 2 variables.<sup>13</sup> We additionally controlled for the day of the week (Monday = 0 to Friday = 4) in our analysis to account for potential priming effects by repeating surveys over the five working days of a week (e.g., Gabriel et al., 2018).

### 4.2.1 | Midday questionnaire

#### *Frequency of daily work interruptions*

We measured frequency of daily work interruptions with two items from Semmer et al.'s (1999) scale (example item: “Today I was interrupted at work by supervisors, colleagues, employees, or customers”).

#### *Daily control appraisal*

To capture daily secondary appraisal, we measured daily control appraisal with a 4-item scale from Feldman et al., 2004 (adapted from Peacock & Wong, 1990), adapted to day-specific assessment (example item: “Today I could handle the demands of the task”).

#### *Daily hindrance appraisal*

We measured daily hindrance appraisal with a 4-item scale from Searle and Auton (2015), adapted to day-specific assessment (example: “Today work interruptions hinder any achievements I might have”).

#### *Daily threat appraisal*

We measured daily threat appraisal with a 3-item scale from Feldman et al., 2004, adapted from Peacock and Wong, (1990), adapted to day-specific assessment (example item: “Today I feel that work interruptions may be a negative experience for me”).

#### *Daily challenge appraisal*

We measured daily challenge appraisal with a 4-item scales from Searle and Auton (2015), adapted to day-specific assessment (example item: “Today work interruptions help me to learn a lot”).

### 4.2.2 | Afternoon questionnaire

#### *Daily negative affect*

We measured daily negative affect with the 10-item PANAS (Watson et al., 1988; example items: “distressed,” “upset”).

#### *Daily work goal progress*

We measured daily work goal progress with a 6-item scale by Koopman et al., 2016; adapted from a job search progress scale by Wanberg et al., 2010 (example item: “Today, I have been productive”).

### 4.2.3 | Evening questionnaire

#### *Daily job satisfaction*

Daily job satisfaction was measured with the 3-item MOAQ-JSS (Cammann et al., 1983) adapted to day-specific assessment (item: “Today, I am satisfied with my job”).

<sup>13</sup>The Appendix S1 (see Table S1; [https://osf.io/3fgqr/?view\\_only=5b900fd81cea4d8e929dbc3291efbb34](https://osf.io/3fgqr/?view_only=5b900fd81cea4d8e929dbc3291efbb34)) also provides a detailed overview of all instructions, scales, and corresponding items used to measure the variables in Study 2.

## 4.2.4 | Construct validity

We conducted mCFAs using Mplus 8 (Muthén & Muthén, 1998–2017) to examine the validity of the used measures. For the proposed eight-factor model ( $M_0$ ), frequency of daily work interruptions, daily control appraisal, daily hindrance appraisal, daily threat appraisal, daily challenge appraisal, daily negative affect, daily work goal progress, and daily job satisfaction were all loaded onto their respective separate factors. This model,  $M_0$ , fitted the data better than any of the alternative models. A detailed overview of the model comparisons can be found in Table S6.<sup>14</sup>

## 4.3 | Analytic strategy

Consistent with the procedure in Study 1, we applied a multilevel approach with full information maximum likelihood estimation using the Mplus 8 software (Muthén & Muthén, 1998–2017) for hypothesis testing. First, we estimated a multilevel fixed effects mediation model. Specifically, we regressed daily hindrance, threat, and challenge appraisals (i.e., first-stage mediators) on the frequency of daily work interruptions and daily control appraisals at the within-person level; daily negative affect and daily work goal progress (i.e., second-stage mediators) were regressed on daily hindrance, threat, and challenge appraisals; finally, daily job satisfaction after work (i.e., the outcome) was regressed on daily negative affect and daily work goal progress, as well as on the frequency of daily work interruptions and daily control appraisals, to control for the direct effects of the predictors and the moderator on the outcome. In addition, we controlled for the effects of day of the week on all outcome variables and mediators. Again, we centered the predictor (frequency of daily work interruptions), the moderator (daily control appraisal), and all first- and second-stage mediator variables at the respective person's mean.

To test the moderating effects of daily control appraisal, we estimated a multilevel moderation model. To do so, we added the interaction term between-person-mean centered frequency of daily work interruptions and person-mean centered daily control appraisal (i.e., person-mean centered frequent daily work interruptions  $\times$  person-mean centered daily control appraisal; Liu et al., 2012) to the previous model as predictor of daily hindrance, threat, and challenge appraisals (i.e., first-stage mediators).

## 4.4 | Results

### 4.4.1 | Hypothesis testing

Results for the mediation model are presented in Table 6.<sup>15</sup> The results showed that an individual experiencing more frequent daily

work interruptions was related to higher daily hindrance appraisal ( $\gamma = .342$ ,  $z = 11.460$ ,  $p < .001$ ), but hindrance appraisal was not related to daily negative affect ( $\gamma = .036$ ,  $z = 0.991$ ,  $p = .322$ ). The indirect effect between frequency of daily work interruptions and daily negative affect via daily hindrance appraisal was also not significant (indirect effect = .012, 95% MC CI: [−.012, .037]), so Hypothesis 1b was not supported.

More frequent daily work interruptions were also related to higher daily threat appraisal ( $\gamma = .352$ ,  $z = 11.752$ ,  $p < .001$ ), which was related to higher daily negative affect ( $\gamma = .086$ ,  $z = 2.297$ ,  $p = .022$ ). The indirect effect between frequency of daily work interruptions and daily negative affect via daily threat appraisal was significant (indirect effect = .030, 95% MC CI: [.005, .058]), supporting Hypothesis 1c.

Frequency of daily work interruptions was also related to higher daily challenge appraisal ( $\gamma = .260$ ,  $z = 7.944$ ,  $p < .001$ ), but challenge appraisal was not related to daily work goal progress ( $\gamma = -.012$ ,  $z = -.0274$ ,  $p = .784$ ). The indirect effect between frequency of daily work interruptions and daily work goal progress via daily challenge was not significant (indirect effect = −.003, 95% MC CI: [−.028, .018]), so Hypothesis 2b was not supported. We also obtained an unexpected result showing that daily threat appraisal was negatively related to work goal progress ( $\gamma = -.111$ ,  $z = -2.345$ ,  $p = .019$ ). The indirect effect between frequency daily work interruptions and daily work goal progress via daily threat appraisal was also significant (indirect effect = −.040, 95% MC CI: [−.072, −.007]).

Next, daily negative affect was related to lower daily job satisfaction ( $\gamma = -.216$ ,  $z = -3.802$ ,  $p < .001$ ), supporting Hypothesis 3. Higher daily work goal progress was related to higher daily job satisfaction ( $\gamma = .347$ ,  $z = 8.065$ ,  $p < .001$ ), supporting Hypothesis 4. Finally, the conceptual model for Study 2 implies that frequency of daily work interruptions influences daily primary appraisals, daily negative affect and daily work goal progress, and, via these, further daily job satisfaction after work. Therefore, we also calculated indirect effects for serial mediation (see Table 7).

Regarding the moderation model results (see Table 8), we found that the interaction between frequency of daily work interruptions and daily control appraisals was not related to daily hindrance appraisal ( $\gamma = -.054$ ,  $z = -1.588$ ,  $p = .112$ ), which did not support

(i.e., Hypothesis 2a). Results indicated that, on days when an individual experiences more frequent daily work interruptions, they also experience higher daily negative affect ( $\gamma = .049$ ,  $z = 2.844$ ,  $p = .004$ ), consistent with Hypothesis 1a. However, on days when an individual experiences more frequent daily work interruptions, they also experience less daily work goal progress ( $\gamma = -.062$ ,  $z = -2.198$ ,  $p = .028$ ), which is the opposite of the relationship proposed in Hypothesis 2a. For the full model, see Table S7 ([https://osf.io/3fgqr/?view\\_only=5b900fd81cea4d8e929dbc3291efbb34](https://osf.io/3fgqr/?view_only=5b900fd81cea4d8e929dbc3291efbb34)).

In addition, we also replicated the mediation model from Study 1 (i.e., the model without primary appraisals) to test a model with daily positive affect (10-item scale; Watson et al., 1988) as a mediator instead of daily work goal progress for the relationship between the frequency of work interruptions and daily job satisfaction. We did this to test whether daily positive affect, in addition to daily negative affect, is a mediator of the proposed relationships. Results indicated that the frequency of daily work interruptions were positively associated with daily negative affect ( $\gamma = .056$ ,  $z = 3.144$ ,  $p = .002$ ) but not with daily positive affect ( $\gamma = -.027$ ,  $z = -1.150$ ,  $p = .250$ ). Both daily negative affect ( $\gamma = -.322$ ,  $z = -5.321$ ,  $p < .001$ ) and daily positive affect ( $\gamma = .240$ ,  $z = 4.271$ ,  $p < .001$ ) were related to daily job satisfaction. For more information and the full model, see Table S8 ([https://osf.io/3fgqr/?view\\_only=5b900fd81cea4d8e929dbc3291efbb34](https://osf.io/3fgqr/?view_only=5b900fd81cea4d8e929dbc3291efbb34)).

<sup>14</sup>See note 5.

<sup>15</sup>We also replicated the mediation model from Study 1 (i.e., the model without primary appraisals) for Study 2 to examine direct relationships between the frequency of daily work interruptions and daily negative affect (i.e., Hypothesis 1a) and daily work goal progress

**TABLE 6** Unstandardized coefficients of the mediation model for Study 2.

Variables	Daily hindrance appraisal		Daily threat appraisal		Daily challenge appraisal		Daily negative affect		Daily work goal progress		Daily job satisfaction	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Mean											5.352**	.079
<i>Control variable</i>												
Study day <sup>a</sup>	.006	.006	.003	.006	-.014	.007	-.015**	.005	.005	.007	.027	.017
<i>Independent variables</i>												
Frequency of daily work interruptions	.342**	.030	.352**	.030	.260**	.033	–	–	–	–	-.012	.021
Daily control appraisal	-.171**	.054	-.178**	.061	.111*	.052	–	–	–	–	.142**	.039
<i>Appraisals (first-stage mediators)</i>												
Daily hindrance appraisal	–	–	–	–	–	–	.036	.036	-.063	.053	–	–
Daily threat appraisal	–	–	–	–	–	–	.086*	.037	-.111*	.047	–	–
Daily challenge appraisal	–	–	–	–	–	–	-.010	.020	-.012	.044	–	–
<i>Mediators (second-stage)</i>												
Daily negative affect	–	–	–	–	–	–	–	–	–	–	-.216**	.057
Daily work goal progress	–	–	–	–	–	–	–	–	–	–	.347**	.043
<i>Residual variances (within)</i>												
R <sup>2</sup> (within)	.559**	.050	.579**	.055	.610**	.050	.236**	.027	.550**	.053	.435**	.044
R <sup>2</sup> (within)	.270**	.033	.276**	.031	.138**	.034	.035*	.016	.029*	.014	.185**	.032

Abbreviation: SE, standard error.

<sup>a</sup>For study day: Monday = 0; Tuesday = 1; Wednesday = 2; Thursday = 3; Friday = 4.

\* $p < .05$ , and \*\* $p < .01$ .

Hypothesis 5a. The interaction was also not related to daily threat appraisal ( $\gamma = -.055$ ,  $z = -1.939$ ,  $p = .053$ ), which did not support Hypothesis 5b, although the significance level approached conventional thresholds.<sup>16</sup>

Because daily control appraisals did not moderate the relationship between frequency of daily work interruptions and daily hindrance appraisal, they consequently did not moderate the indirect effects of frequency of daily work interruptions via daily hindrance appraisal and then daily negative affect, on daily job satisfaction, failing to support Hypothesis 6a. Moreover, because daily control appraisals did not moderate the relationship between frequency of daily work interruptions and daily threat appraisal, they consequently did not moderate the indirect effects of frequency of daily work interruptions via daily threat appraisal and then daily negative affect, on daily job satisfaction, failing to support Hypothesis 6b.

Finally, the interaction between frequency daily work interruptions and daily control appraisals was not related to daily challenge appraisal ( $\gamma = -.006$ ,  $z = 0.120$ ,  $p = .905$ ), failing to support Hypothesis 7. Consequently, daily control appraisals did not moderate the indirect effect of frequency of daily work interruptions via daily challenge appraisal and then daily work goal progress, on daily job satisfaction, failing to support Hypothesis 8.

<sup>16</sup>We also conducted a simple slope analysis (see Figure 2) that revealed that, on days when employees' control appraisal was low (1 SD below the within-sample mean for daily control appraisal), the frequency of daily work interruptions was significantly related to higher daily threat appraisal ( $\gamma = .387$ ,  $t = 11.163$ ,  $p < .001$ ). On days when employees' control appraisal was high (1 SD above the within-sample mean for daily perceived overqualification), the

#### 4.4.2 | Supplemental analyses

As in Study 1, we examined whether the frequency of daily work interruptions might have nonlinear effects on daily hindrance, threat, and challenge appraisals, in that frequent daily work interruptions beyond a certain point might lead to a ceiling effect or contain an inflection point in their relationship with individuals' appraisals. We ran a series of models (mediation and moderation models) that included linear and quadratic effects between frequency of daily work interruptions and appraisals. For the mediation model (see Table S9a<sup>17</sup>), all linear effects remained the same as reported above, and we found no significant quadratic effects between frequency of daily work interruptions and daily appraisals.

However, for the moderation model (see Table S1<sup>18</sup>), we found that the interaction between frequency of daily work interruptions and daily control appraisals was significantly related to daily threat appraisal ( $\gamma = -.078$ ,  $z = -2.304$ ,  $p = .021$ ). A simple slope analysis for the moderation effect on the linear relationship between frequency of daily work interruptions and daily threat appraisal indicated that daily control appraisal buffered the relationship between frequency of daily work interruptions and daily threat appraisal: On days when employees' control appraisal was high (1 SD above the within-sample mean for daily control appraisal), the relationship between

frequency of daily work interruptions was still related to daily threat appraisal ( $\gamma = .313$ ,  $t = 8.812$ ,  $p < .001$ ), although the slope was less steep.

<sup>17</sup>See note 5.

<sup>18</sup>See note 5.

**TABLE 7** Overall serial mediation effects based on the mediation model and conditional indirect effects based on the moderation model for Study 2.

Variables	Indirect effect	
	Estimate	Bias-corrected 95% MC CI <sup>a</sup>
Mediation model		
Frequency of daily work interruptions → <i>daily hindrance appraisal</i> → <i>daily negative affect</i> → daily job satisfaction		
Indirect effect	-.003	[-.008, .003]
Frequency of daily work interruptions → <i>daily threat appraisal</i> → <i>daily negative affect</i> → daily job satisfaction		
Indirect effect	-.007	[-.015, -.001]
Frequency of daily work interruptions → <i>daily challenge appraisal</i> → <i>daily work goal progress</i> → daily job satisfaction		
Indirect effect	-.001	[-.010, .006]
Moderation model		
Frequency of daily work interruptions → <i>daily hindrance appraisal</i> → <i>daily negative affect</i> → daily job satisfaction		
Conditional indirect effects		
High daily control appraisals (HDCA)	-.002	[-.008, .002]
Low daily control appraisal (LDOQ)	-.003	[-.009, .003]
Difference between HDOQ and LDOQ conditions	.001	[-.001, .002]
Frequency of daily work interruptions → <i>daily threat appraisal</i> → <i>daily negative affect</i> → daily job satisfaction		
Conditional indirect effects		
High daily control appraisals (HDCA)	-.006	[-.013, -.001]
Low daily control appraisal (LDOQ)	-.007	[-.017, -.001]
Difference between HDOQ and LDOQ conditions	.001	[-.00003, .005]
Frequency of daily work interruptions → <i>daily challenge appraisal</i> → <i>daily work goal progress</i> → daily job satisfaction		
Conditional indirect effects		
High daily control appraisals (HDCA)	-.001	[-.011, .006]
Low daily control appraisal (LDOQ)	-.001	[-.010, .007]
Difference between HDOQ and LDOQ conditions	.00003	[-.003, .002]

Abbreviation: MC CI, Monte Carlo confidence interval.

<sup>a</sup>We obtained 95% Monte Carlo CIs using 20 000 bootstrap samples (Preacher & Selig, 2012). Significant CIs are in bold.

frequency of daily work interruptions and daily threat appraisal was weaker ( $\gamma = .306$ ,  $t = 8.602$ ,  $p < .001$ ) than on days when employees' control appraisal was low (1 SD below the within-sample mean for

daily control appraisal;  $\gamma = .410$ ,  $t = 10.478$ ,  $p < .001$ ). Figure S2<sup>19</sup> shows the moderation effect, considering both linear and quadratic effects of frequency of daily work interruptions on daily threat appraisal. Because daily control appraisals moderated the relationship between frequency of daily work interruptions and daily threat appraisal in this model, we also computed conditional indirect effects to examine whether daily control appraisal attenuated the indirect effect of frequency of daily work interruptions, via daily threat appraisal and then daily negative affect, on daily job satisfaction. The differences in the conditional indirect effects are presented in Table S10,<sup>20</sup> which shows that daily control appraisal weakened the indirect effect of frequency of daily work interruptions when quadratic effects are considered.

## 5 | GENERAL DISCUSSION

By applying a broad stress appraisal perspective to research on work interruptions, the present daily diary studies aimed to provide a unifying theoretical account for the inconsistent findings regarding the negative and positive effects of frequent daily work interruptions. In the following, we discuss findings across the two studies and elaborate on theoretical and practical implications, as well as limitations and future research directions based on the two studies.

### 5.1 | Findings across the two studies

The results of the two studies are consistent in highlighting threat appraisal as an important mechanism underlying the negative effects of frequent daily work interruptions on affective reactions. Specifically, Study 1 showed that, when an individual experiences frequent work interruption during the day, they also experience higher daily negative affect (i.e., Hypothesis 1a), which is further related to lower daily job satisfaction after work (i.e., Hypothesis 3). Consistent with this, Study 2 further showed that the relationship between the frequency of daily work interruptions and higher daily negative affect (and further to daily job satisfaction) is mainly due to a threat appraisal of frequent work interruptions but not hindrance appraisal (i.e., Hypothesis 1b,c), while we also controlled for the effects of a challenge appraisal. Furthermore, in Study 2, we found that frequent daily work interruptions impair daily work goal progress through higher daily threat appraisals, again suggesting that daily threat appraisal play a key role in driving individuals' reactions to frequent daily work interruptions.

However, we also obtained inconsistent results between the two studies. Specifically, Study 1 showed that, when an individual experiences frequent work interruption during the day, they also report higher daily work goal progress (i.e., Hypothesis 2a), which is further

<sup>19</sup>See note 5.

<sup>20</sup>See note 5.

**TABLE 8** Unstandardized coefficients of the moderation model for Study 2.

Variables	Daily hindrance appraisal		Daily threat appraisal		Daily challenge appraisal		Daily negative affect		Daily work goal progress		Daily job satisfaction	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Mean											5.352**	.079
<i>Control variable</i>												
Study day <sup>a</sup>	.002	.007	-.001	.007	-.015*	.007	-.015**	.005	.005	.007	.027	.017
<i>Independent variables</i>												
Frequency of daily work interruptions	.340**	.030	.350**	.030	.260**	.033	—	—	—	—	-.012	.021
Daily control appraisal	-.171**	.054	-.178**	.061	.111*	.052	—	—	—	—	.142**	.039
<i>Appraisals (first-stage mediators)</i>												
Daily hindrance appraisal	—	—	—	—	—	—	.036	.036	-.063	.053	—	—
Daily threat appraisal	—	—	—	—	—	—	.086*	.037	-.111*	.047	—	—
Daily challenge appraisal	—	—	—	—	—	—	-.010	.020	-.012	.044	—	—
<i>Mediators (second-stage)</i>												
Daily negative affect	—	—	—	—	—	—	—	—	—	—	-.216**	.057
Daily work goal progress	—	—	—	—	—	—	—	—	—	—	.347**	.043
<i>Interaction</i>												
Frequency of daily work interruptions × Daily control appraisal	-.054	.034	-.055+	.028	-.006	.050	—	—	—	—	—	—
<i>Residual variances (within)</i>												
	.556**	.050	.576**	.055	.610**	.050	.236**	.027	.550**	.053	.435**	.044
<i>R<sup>2</sup> (within)</i>												
	.273**	.031	.279**	.031	.138**	.033	.035*	.016	.029*	.014	.185**	.032

Abbreviation: SE, standard error.

<sup>a</sup>For study day: Monday = 0; Tuesday = 1; Wednesday = 2; Thursday = 3; Friday = 4.

+*p* < .10, \**p* < .05, and \*\**p* < .01.

related to higher daily job satisfaction after work (i.e., Hypothesis 4). While Study 2 showed that higher levels of the frequency of daily work interruptions were related to higher daily challenge appraisal, daily challenge appraisal did not translate into higher daily work goal progress (i.e., Hypothesis 2b). Thus, we do not have evidence to conclude that challenge appraisal of frequent daily work interruptions is the key driver of higher daily work goal progress and, therefore, higher daily job satisfaction.

In addition, while we found in Study 1 that the frequency of daily work interruptions was positively related to daily work goal progress, we found the opposite in Study 2 when we replicated the mediation model from Study 1 to test the direct relationship between the frequency of daily work interruptions and daily work goal progress (i.e., Hypothesis 2a). In addition, as we found in Study 1, the frequency of daily work interruptions has a quadratic effect on daily work goal progress. This suggests that frequent daily work interruptions can facilitate daily work goal progress up to a certain point but will not have a facilitating effect as the frequency of daily work interruptions continue to increase. However, no quadratic effects were observed between frequency of daily work interruptions and threat, hindrance, and challenge appraisals when quadratic effects were included in the mediation model for Study 2. One explanation for the inconsistent results may be that we used different designs in the two studies. In Study 1, we measured

the frequency of daily work interruptions and daily work goal progress in the same questionnaire. Thus, participants were likely to be in “catch-up mode” with regard to daily tasks when we asked them to simultaneously report the frequency of daily work interruptions. In contrast, in Study 2, we measured the frequency of daily work interruptions in the midday questionnaire and then measured daily work goal progress in the afternoon questionnaire, when participants could see how their daily work goal progress might have been affected by the frequency of daily work interruptions reported earlier. In other words, we were probably measuring the end state of work goal progress for the workday in Study 2 rather than the progress. Therefore, the time at which daily work goal progress is measured may be a factor in determining the relationships between the frequency of daily work interruptions and daily work goal progress. Nevertheless, more research is needed to further unpack the relationships between frequent daily work interruptions and daily work goal progress.

Finally, regarding moderation effects, we found in Study 1 that daily secondary appraisal of the day's tasks, as indicated by daily perceived overqualification, buffers the effects of frequent daily work interruptions on daily negative affect and thus daily job satisfaction. In Study 2, we only observed that daily control appraisals can significantly attenuate the association between the frequency of daily work interruptions and daily threat appraisal (i.e., Hypothesis 5b) when we

included both linear and quadratic effects of the frequency of daily work interruptions in a supplementary analysis. These findings consistently highlight the importance of daily secondary appraisal in understanding an individual's reaction to the experience of frequent daily work interruptions during a working day, but they are also inconsistent regarding when we can observe the moderating effect of daily secondary appraisal. As we only detected this effect in Study 2 when we also took the quadratic effects of the frequency of daily work interruptions into account, the finding further highlights the importance of considering nonlinear effects (i.e., ceiling effects or inflection points) in stress (appraisal) research (e.g., Jiang et al., 2022; Sonnentag & Frese, 2013).

## 5.2 | Theoretical implications

Our research offers a broad lens of stress appraisals to understand the impact of frequent daily work interruptions on employees' daily work lives. First, and in contrast to the conventional perspective that views frequent daily work interruptions as a hindrance stressor, we found that frequent daily work interruptions can trigger hindrance, threat, and challenge appraisals simultaneously, which is consistent with the findings reported by Smith et al. (2022), and that threat appraisals play a major role in evoking negative affect and undermining work goal progress during the workday. Based on our work, further investigation of the consequences of hindrance and challenge appraisals of frequent daily work interruptions is necessary. We speculate that ego depletion may result from hindrance appraisal of frequent daily work interruptions, whereas proactive behavior related to additional accomplishment may be a consequence of challenge appraisal of frequent daily work interruptions. These are potential mechanisms that merit further exploration.

Second, our results showed that daily secondary appraisal, that is, perceived daily overqualification and daily control appraisal can help buffer the detrimental effects of frequent daily work interruptions. In contrast to previous studies, which have focused on individuals' time-management skills (Ma et al., 2020) or polychronicity (i.e., an individual's preference to engage in multiple activities simultaneously; Pachler et al., 2018), we specifically focus on secondary appraisal of workday characteristics to inform us as about the workday characteristics under which frequent daily work interruptions are more or less likely to elicit a specific stress appraisal. Thus, our findings suggest that frequent daily work interruptions can affect employees differently on different days, even for the same individual. As such, our research suggests the need to understand the day-level context to better unpack the impact of frequent daily work interruptions on employees. On the other hand, as suggested by Baethge et al. (2015), a more fine-grained analysis of the types of work interruptions, their duration, and how they affect employees would be desirable to gain further insight into the specific impact of different types of work interruptions.

Finally, our studies contribute to the research on the frequency of daily work interruptions and daily well-being. Because we consistently

found that daily negative affect can undermine daily job satisfaction in the evening, while daily work goal progress can promote daily job satisfaction across the two studies, there are two possible approaches to shaping the impact of frequent daily work interruptions on employees' daily well-being. The first approach is to mitigate the detrimental effects of frequent daily work interruptions, such as buffering their impact on daily negative affect, as results from both studies consistently show. The second approach is to promote the positive effect of frequent daily work interruptions, such as enhancing its role in facilitating progress toward work goals, which requires further investigation. In short, our studies provide an opportunity to use a dual approach to protect employees' daily well-being from the experience of frequent daily work interruptions.

## 5.3 | Practical implications

Our study has several practical implications for individuals and organizations. First, the results of both studies suggest that work interruptions should be limited to some extent. In both studies, frequent daily work interruptions are consistently associated with higher daily negative affect—directly in Study 1 and via daily threat appraisal in Study 2—and further with lower daily job satisfaction. To reduce such adverse effects, employees should be allowed the option to use “do not disturb” features during certain periods of the day to reduce the frequency of interruptions. In a related vein, the results of Study 2 suggest that threat appraisal is an important driver of the negative consequences of interruptions. Therefore, training and interventions aimed at altering threat appraisal of daily interruptions, for example, on stress mindset and coping strategies may also be beneficial for employees (e.g., Crum et al., 2017; Sonnentag & Frese, 2013; Williams et al., 2009).

Second, as discussed earlier, based on the moderating effects we observed in both studies, having sufficient resources on a workday (i.e., daily perceived overqualification) or having a sense of control over workdays (i.e., daily control appraisal) can mitigate the detrimental effects of frequent daily work interruptions on employees' daily job satisfaction. Consistent with this, research on job control, for example, suggests that employees should be able to control their work environment to at least prevent external interruptions while working on specific tasks (e.g., Glass et al., 1973; Parker, 2014).

Finally, our findings also have practical implications for employees who experience days with higher daily perceived overqualification than on other days. Organizations should make employees who experience such days aware of the benefits of being overqualified for some tasks. Following work design ideas (e.g., Parker et al., 2017; Wrzesniewski & Dutton, 2001), an individual could then craft their job so that tasks for which they are overqualified alternate with tasks whose demands match their capabilities within a workday (for similar ideas regarding routinized tasks, see Ohly et al., 2017). In this way, tasks that are not challenging enough (i.e., tasks for which one is overqualified) and the resulting surplus of capabilities can benefit an employee during stressful workdays, even if the task itself is not interesting.

## 5.4 | Limitations and directions for future research

The contributions of this research must be viewed in light of several limitations. First, we did not record interruption events at the time they occurred but rather measured frequency of daily work interruptions with one measurement per day for both studies, implying that our findings reflect the effects of multiple interruptions during the workday on mediators and outcomes. This approach naturally misses some of the complexity inherent in work interruptions due to their various possible characteristics, such as different sources (i.e., work-related or nonwork-related, internal vs. external), the modality or channel of interaction (face-to-face, email, phone call, etc.), whether or not they involve a secondary task, or their duration and severity (Puranik et al., 2020). Despite the potential insights that an episodic (i.e., event-level) approach that focuses on different characteristics of individual interruption events might provide, the frequency (i.e., day-level) approach chosen has several advantages. By using the frequency approach, research can capture the effects of multiple interruptions over the course of a day, as is common in today's workplaces (e.g., Puranik et al., 2020). This is particularly important because some of the effects of daily work interruptions may only become apparent over the course of a workday, in which frequent interruptions are experienced, but not necessarily at the level of a single interruption event (see also Frese & Zapf, 1988; Sonnentag et al., 2014). Furthermore, owing to the nature of the episodic approach of assessing the type and consequence of interruptions for each event, such an approach may itself be disruptive and lead to reactivity problems (Barta et al., 2012). Thus, episodic approaches to the study of everyday experiences are better suited to capturing low-frequency events (Reis & Gable, 2000) than work interruptions, which occur frequently in today's work environment (e.g., Puranik et al., 2020; Wajcman & Rose, 2011).

Nevertheless, future research could build on the findings of the current study by adopting an episodic approach. For example, this might shed light on how the different characteristics of interruptions might affect primary appraisal processes. Nonwork-related interruptions might be more likely to be appraised as a hindrance that thwarts goal attainment or as a threat that brings potential harm or loss to one's work, whereas work-related interruptions might be more likely to be appraised as challenge that are beneficial in terms of information exchange (e.g., Baethge et al., 2015; Jett & George, 2003). Consistent with the use of an episodic sampling approach, Butts et al. (2015) showed that different attributes (i.e., affective tone, time required) of electronic communications received during nonwork time differentially affected employees' emotional responses. Thus, research on how individuals appraise individual interruption events could further our understanding of stress reactions and provide insight into relevant coping factors (i.e., boundary conditions of stress reactions).

Second, common method bias may also be an issue, especially for Study 1, where we assessed measures of predictor, moderator, and mediators in the same daily questionnaire. We improved this in the design for Study 2 by separating the measurement of the predictor, moderator, and first-stage mediators (i.e., frequent daily work interruptions, daily control

appraisal, and hindrance, threat, and challenge appraisal) from the measurement of second-stage mediators (i.e., daily negative affect and daily work goal progress). This resulted in participants completing three questionnaires per day (instead of two as in Study 1).

Relatedly, we used self-report measures in our studies. While some constructs of our theoretical model, such as perceptions of frequent work interruptions as a stressor, stress appraisals, negative affect, or daily secondary appraisal are best captured by self-report measures (e.g., Erdogan et al., 2011; Haeffel & Howard, 2010; Sonnentag & Frese, 2013), we cannot rule out concerns about same-source bias (Podsakoff et al., 2012). However, person-level variables as drivers of within-person results can be ruled out due to the centering approach chosen (i.e., person-mean-centering) owing to the daily survey design (Enders & Tofighi, 2007). With regard to other sources of potential common method bias, such as bias due to transient mood states (Podsakoff et al., 2003), research might control for previous period measures of variables, thereby reducing sources of common method bias (Gabriel et al., 2018). Additionally, researchers could also account for weekly cycles in mood by controlling for the day of the week (Gabriel et al., 2018). Results from supplementary analysis for Study 1 reported in Tables S5a and S5b, in which we controlled for the previous day's measures and for the day of the week, show that all hypothesized effects remained constant. We also controlled for day of the week in Study 2. Nevertheless, future diary studies should strive to assess constructs using more objective methods or varying item characteristics to further counteract sources of common method biases, such as mood bias and same-item bias (e.g., Gabriel et al., 2018).

Furthermore, although causal inferences cannot be drawn from our studies because of the correlational design, we followed best practices in daily diary research by using different temporal references in the instructions for the predictor and moderator, the mediators, and the outcome (e.g., Park & Kim, 2019; Sonnentag et al., 2018). This also addressed issues of endogeneity and, more specifically, simultaneity (Antonakis et al., 2010). Although we cannot completely rule out any endogeneity issues, the fact that the time frames in the instructions for the predictor and appraisal variables do not overlap with the time frames for the (second-stage) mediators (i.e., daily negative affect and daily work goal progress) and the outcome ensures that the measurement of the predictor and appraisal variables precedes the later variables in time.

Finally, although we controlled for the effects of repeating surveys over 2 weeks in Study 1 and over a week in Study 2, we cannot completely rule out a priming effect from the first survey or from repeating the survey over multiple days (e.g., Gabriel et al., 2018). In this regard, future studies may also want to address methodological challenges and find innovative ways to study interruptions. This will be particularly important for studies using an episodic approach, to prevent the measurement process from interfering with the construct and related processes of interest. This could also avoid the problem of prompts for event-based sampling questionnaires becoming an artificial interruption themselves (Barta et al., 2012). As technology develops, we may be able to record interruption events and their nature without the individual's input, reducing the burden of daily

diary studies. Similarly, smart devices may help with alternative measures of stress reactions (e.g., Di Lascio et al., 2018, 2020).

## 6 | CONCLUSION

By bringing a broad stress appraisal lens to the study of frequent daily work interruptions, our study provides a theoretical account for understanding individuals' reactions to frequent daily work interruptions. Our study shows that frequent daily work interruptions can elicit hindrance, threat, and challenge appraisals, and threat appraisals were found to increase employees' daily negative affect and undermine daily work goal progress and, thus, daily job satisfaction. Further research is needed to determine the consequences of hindrance and challenge appraisals of frequent daily work interruptions. Although we found that frequent daily work interruptions can facilitate daily work goal progress, this finding was not consistently observed, suggesting the need for further investigation into when such positive effects are more likely to occur. Taken together, our research provides a broad lens of stress appraisal to expand future research on frequent daily work interruptions.

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### CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could appear to have influenced the work reported in this paper.

### DATA AVAILABILITY STATEMENT

Data are available from the corresponding author upon reasonable request.

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### REFERENCES

- Altmann, E. M., Trafton, J. G., & Hambrick, D. Z. (2014). Momentary interruptions can derail the train of thought. *Journal of Experimental Psychology: General*, 143(1), 215–226. <https://doi.org/10.1037/a0030986>
- Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *The Leadership Quarterly*, 21(6), 1086–1120. <https://doi.org/10.1016/j.leaqua.2010.10.010>
- Baethge, A., & Rigotti, T. (2013). Interruptions to workflow: Their relationship with irritation and satisfaction with performance, and the mediating roles of time pressure and mental demands. *Work & Stress*, 27(1), 43–64. <https://doi.org/10.1080/02678373.2013.761783>
- Baethge, A., & Rigotti, T. (2015). Three-way interactions among interruptions/multitasking demands, occupational age, and alertness: A diary study. *Work, Aging and Retirement*, 1(4), 393–410. <https://doi.org/10.1093/workar/wav014>
- Baethge, A., Rigotti, T., & Roe, R. A. (2015). Just more of the same, or different? An integrative theoretical framework for the study of cumulative interruptions at work. *European Journal of Work and Organizational Psychology*, 24(2), 308–323. <https://doi.org/10.1080/1359432X.2014.897943>
- Barta, W. D., Tennen, H., & Litt, M. D. (2012). Measurement reactivity in diary research. In *Handbook of research methods for studying daily life* (pp. 108–123). The Guilford Press.
- Baumeister, R. F., Muraven, M., & Tice, D. M. (2000). Ego depletion: A resource model of volition, self-regulation, and controlled processing. *Social Cognition*, 18(2), 130–150. <https://doi.org/10.1521/soco.2000.18.2.130>
- Beal, D. J. (2015). ESM 2.0: State of the art and future potential of experience sampling methods in organizational research. *Annual Review of Organizational Psychology and Organizational Behavior*, 2(1), 383–407. <https://doi.org/10.1146/annurev-orgpsych-032414-111335>
- Butts, M., Becker, W., & Boswell, W. (2015). Hot buttons and time sinks: The effects of electronic communication during nonwork time on emotions and work-nonwork conflict. *Academy of Management Journal*, 58(3), 763–788. <https://doi.org/10.5465/amj.2014.0170>
- Cammann, C., Fichman, M., Jenkins, G. D., & Klesh, J. (1983). Michigan Organizational Assessment Questionnaire. In S. E. Seashore, E. E. Lawler, P. H. Mirvis, & C. Cammann (Eds.), *Assessing organizational change: A guide to methods, measures, and practices* (pp. 71–138). John Wiley & Sons.
- Carver, C. S., & Scheier, M. F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review*, 97(1), 19–35. <https://doi.org/10.1037/0033-295X.97.1.19>
- Cavanaugh, M. A., Boswell, W. R., Roehling, M. V., & Boudreau, J. W. (2000). An empirical examination of self-reported work stress among U.S. managers. *Journal of Applied Psychology*, 85(1), 65–74. <https://doi.org/10.1037/0021-9010.85.1.65>
- Crum, A. J., Akinola, M., Martin, A., & Fath, S. (2017). The role of stress mindset in shaping cognitive, emotional, and physiological responses to challenging and threatening stress. *Anxiety, Stress, & Coping*, 30(4), 379–395. <https://doi.org/10.1080/10615806.2016.1275585>
- de Jonge, J., & Dormann, C. (2006). Stressors, resources, and strain at work: A longitudinal test of the triple-match principle. *Journal of Applied Psychology*, 91(6), 1359–1374. <https://doi.org/10.1037/0021-9010.91.5.1359>
- Debus, M. E., Gross, C., & Kleinmann, M. (2019). The power of doing: How job crafting transmits the beneficial impact of autonomy among over-qualified employees. *Journal of Business and Psychology*, 35(3), 317–331. <https://doi.org/10.1007/s10869-019-09625-y>
- Debus, M. E., Sonntag, S., Deutsch, W., & Nussbeck, F. (2014). Making flow happen: The effects of being recovered on work-related flow between and within days. *Journal of Applied Psychology*, 99(4), 713–722. <https://doi.org/10.1037/a0035881>
- Di Lascio, E., Gashi, S., Hidalgo, J. S., Nale, B., Debus, M. E., & Santini, S. (2020). A multi-sensor approach to automatically recognize breaks and work activities of knowledge workers in academia. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 4(3), 1–20. <https://doi.org/10.1145/3411821>
- Di Lascio, E., Gashi, S., & Santini, S. (2018). Unobtrusive assessment of students' emotional engagement during lectures using electrodermal activity sensors. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 2(3), 1–21. <https://doi.org/10.1145/3264913>

- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125(2), 276–302. <https://doi.org/10.1037/0033-2909.125.2.276>
- Enders, C. K., & Bandalos, D. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal*, 8(3), 430–457. [https://doi.org/10.1207/s15328007sem0803\\_5](https://doi.org/10.1207/s15328007sem0803_5)
- Enders, C. K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods*, 12(2), 121–138. <https://doi.org/10.1037/1082-989X.12.2.121.supp>
- Erdogan, B., & Bauer, T. N. (2021). Overqualification at work: A review and synthesis of the literature. *Annual Review of Organizational Psychology and Organizational Behavior*, 8(1), 259–283. <https://doi.org/10.1146/annurev-orgpsych-012420-055831>
- Erdogan, B., Bauer, T. N., Peiró, J. M., & Truxillo, D. M. (2011). Overqualified employees: Making the best of a potentially bad situation for individuals and organizations. *Industrial and Organizational Psychology*, 4(2), 215–232. <https://doi.org/10.1111/j.1754-9434.2011.01330.x>
- Feldman, P. J., Cohen, S., Hamrick, N., & Lepore, S. J. (2004). Psychological stress, appraisal, emotion and cardiovascular response in a public speaking task. *Psychology & Health*, 19(3), 353–368. <https://doi.org/10.1080/0887044042000193497>
- Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology*, 46(4), 839–852. <https://doi.org/10.1037/0022-3514.46.4.839>
- Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, 50(5), 992–1003. <https://doi.org/10.1037/0022-3514.50.5.992>
- Frese, M., & Zapf, D. (1988). Methodological issues in the study of work stress: Objective vs subjective measurement of work stress and the question of longitudinal studies. In C. L. Cooper & R. Payne (Eds.), *Causes, coping and consequences of stress at work* (pp. 375–411). Wiley.
- Frese, M., & Zapf, D. (1994). Action as the core of work psychology: A German approach. In H. C. Triandis & M. D. Dunnette (Eds.), *Handbook of industrial and organizational psychology* (pp. 271–340). Consulting Psychologists Press.
- Gabriel, A. S., Podsakoff, N. P., Beal, D. J., Scott, B. A., Sonnentag, S., Trougakos, J. P., & Butts, M. M. (2018). Experience sampling methods: A discussion of critical trends and considerations for scholarly advancement. *Organizational Research Methods*, 22(4), 969–1006. <https://doi.org/10.1177/1094428118802626>
- Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods*, 19(1), 72–91. <https://doi.org/10.1037/a0032138>
- Glass, D. C., Singer, J. E., Leonard, H. S., Krantz, D., Cohen, S., & Cummings, H. (1973). Perceived control of aversive stimulation and the reduction of stress responses. *Journal of Personality*, 41(4), 577–595. <https://doi.org/10.1111/j.1467-6494.1973.tb00112.x>
- Gupta, A., Li, H., & Sharda, R. (2013). Should I send this message? Understanding the impact of interruptions, social hierarchy and perceived task complexity on user performance and perceived workload. *Decision Support Systems*, 55(1), 135–145. <https://doi.org/10.1016/j.dss.2012.12.035>
- Haefel, G. J., & Howard, G. S. (2010). Self-report: Psychology's four-letter word. *The American Journal of Psychology*, 123(2), 181–188. <https://doi.org/10.5406/amerjpsyc.123.2.0181>
- Hayes, A. F., & Preacher, K. J. (2010). Quantifying and testing indirect effects in simple mediation models when the constituent paths are nonlinear. *Multivariate Behavioral Research*, 45(4), 627–660. <https://doi.org/10.1080/00273171.2010.498290>
- Hunter, E. M., Clark, M. A., & Carlson, D. S. (2019). Violating work-family boundaries: Reactions to interruptions at work and home. *Journal of Management*, 45(3), 1284–1308. <https://doi.org/10.1177/0149206317702221>
- Ilies, R., & Judge, T. A. (2002). Understanding the dynamic relationships among personality, mood, and job satisfaction: A field experience sampling study. *Organizational Behavior and Human Decision Processes*, 89(2), 1119–1139. [https://doi.org/10.1016/S0749-5978\(02\)00018-3](https://doi.org/10.1016/S0749-5978(02)00018-3)
- Ilies, R., Schwind, K. M., & Heller, D. (2007). Employee well-being: A multi-level model linking work and nonwork domains. *European Journal of Work and Organizational Psychology*, 16(3), 326–341. <https://doi.org/10.1080/13594320701363712>
- Jett, Q. R., & George, J. M. (2003). Work interrupted: A closer look at the role of interruptions in organizational life. *Academy of Management Review*, 28(3), 494–507. <https://doi.org/10.2307/30040736>
- Jiang, L., Lawrence, A., & Xu, X. (2022). Does a stick work? A meta-analytic examination of curvilinear relationships between job insecurity and employee workplace behaviors. *Journal of Organizational Behavior*, 43(8), 1410–1445. <https://doi.org/10.1002/job.2652>
- Johnson, G. J., & Johnson, W. R. (1996). Perceived overqualification and psychological well-being. *Journal of Social Psychology*, 136(4), 435–445. <https://doi.org/10.1080/00224545.1996.9714025>
- Judge, T. A., & Ilies, R. (2004). Affect and job satisfaction: A study of their relationship at work and at home. *Journal of Applied Psychology*, 89(4), 661–673. <https://doi.org/10.1037/0021-9010.89.4.661>
- Khan, L. J., & Morrow, P. C. (1991). Objective and subjective underemployment relationships to job satisfaction. *Journal of Business Research*, 22(3), 211–218. [https://doi.org/10.1016/0148-2963\(91\)90002-F](https://doi.org/10.1016/0148-2963(91)90002-F)
- Klein, H. J. (1989). An integrated control theory model of work motivation. *The Academy of Management Review*, 14(2), 150–172. <https://doi.org/10.2307/258414>
- Koopman, J., Lanaj, K., & Scott, B. A. (2016). Integrating the bright and dark sides of OCB: A daily investigation of the benefits and costs of helping others. *Academy of Management Journal*, 59(2), 414–435. <https://doi.org/10.5465/amj.2014.0262>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
- Liu, C., & Li, H. (2018). Stressors and stressor appraisals: The moderating effect of task efficacy. *Journal of Business and Psychology*, 33(1), 141–154. <https://www.jstor.org/stable/48700733>, <https://doi.org/10.1007/s10869-016-9483-4>
- Liu, D., Zhang, Z., & Wang, M. (2012). Mono-level and multilevel mediated moderation and moderated mediation: Theorizing and test. In X. Chen, A. Tsui, & L. Farh (Eds.), *Empirical methods in organization and management research (in Chinese)* (2nd ed., pp. 545–579). Peking University Press.
- Locke, E. A. (1969). What is job satisfaction? *Organizational Behavior & Human Performance*, 4(4), 309–336. [https://doi.org/10.1016/0030-5073\(69\)90013-0](https://doi.org/10.1016/0030-5073(69)90013-0)
- Locke, E. A. (1976). The nature and causes of job satisfaction. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 1297–1343). Rand McNally.
- Ma, J., Kerulis, A. M., Wang, Y., & Sachdev, A. R. (2020). Are workflow interruptions a hindrance stressor? The moderating effect of time-management skill. *International Journal of Stress Management*, 27(3), 252–261. <https://doi.org/10.1037/str0000149>
- McCormick, B. W., Reeves, C. J., Downes, P. E., Li, N., & Ilies, R. (2020). Scientific contributions of within-person research in management: Making the juice worth the squeeze. *Journal of Management*, 46(2), 321–350. <https://doi.org/10.1177/0149206318788435>
- Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.
- Ohly, S., Göritz, A. S., & Schmitt, A. (2017). The power of routinized task behavior for energy at work. *Journal of Vocational Behavior*, 103(Part B), 132–142. <https://doi.org/10.1016/j.jvb.2017.08.008>
- Pachler, D., Kuonath, A., Specht, J., Kennecke, S., Agthe, M., & Frey, D. (2018). Workflow interruptions and employee work outcomes: The

- moderating role of polychronicity. *Journal of Occupational Health Psychology*, 23(3), 417–427. <https://doi.org/10.1037/ocp0000094>
- Park, Y., & Kim, S. (2019). Customer mistreatment harms nightly sleep and next-morning recovery: Job control and recovery self-efficacy as cross-level moderators. *Journal of Occupational Health Psychology*, 24(2), 256–269. <https://doi.org/10.1037/ocp0000128>
- Parke, M. R., Weinhardt, J. M., Brodsky, A., Tangirala, S., & DeVoe, S. E. (2018). When daily planning improves employee performance: The importance of planning type, engagement, and interruptions. *Journal of Applied Psychology*, 103(3), 300–312. <https://doi.org/10.1037/apl0000278>
- Parker, S. K. (2014). Beyond motivation: Job and work design for development, health, ambidexterity, and more. *Annual Review of Psychology*, 65(1), 661–691. <https://doi.org/10.1146/annurev-psych-010213-115208>
- Parker, S. K., Morgeson, F. P., & Johns, G. (2017). One hundred years of work design research: Looking back and looking forward. *Journal of Applied Psychology*, 102(3), 403–420. <https://doi.org/10.1037/apl0000106>
- Peacock, E. J., & Wong, P. T. P. (1990). The stress appraisal measure (SAM): A multidimensional approach to cognitive appraisal. *Stress Medicine*, 6(3), 227–236. <https://doi.org/10.1002/smi.2460060308>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63, 539–569. <https://doi.org/10.1146/annurev-psych-120710-100452>
- Preacher, K. J., & Selig, J. P. (2012). Advantages of Monte Carlo confidence intervals for indirect effects. *Communication Methods and Measures*, 6, 77–98. <https://doi.org/10.1080/19312458.2012.679848>
- Puranik, H., Koopman, J., & Vough, H. C. (2020). Pardon the interruption: An integrative review and future research agenda for research on work interruptions. *Journal of Management*, 46(6), 806–842. <https://doi.org/10.1177/0149206319887428>
- Puranik, H., Koopman, J., & Vough, H. C. (2021). Excuse me, do you have a minute? An exploration of the dark- and bright-side effects of daily work interruptions for employee well-being. *Journal of Applied Psychology*, 106, 1867–1884. <https://doi.org/10.1037/apl0000875>
- Reis, H. T., & Gable, S. L. (2000). Event-sampling and other methods for studying everyday experience. In *Handbook of research methods in social and personality psychology* (pp. 190–222). Cambridge University Press.
- Rusting, C. L., & Dehart, T. (2000). Retrieving positive memories to regulate negative mood: Consequences for mood-congruent memory. *Journal of Personality and Social Psychology*, 78(4), 737–752. <https://doi.org/10.1037/0022-3514.78.4.737>
- Schwarz, N. (2012). Feelings-as-information theory. In P. V. Lange, A. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (Vol. 1, pp. 289–308). Sage. <https://doi.org/10.4135/9781446249215.n15>
- Searle, B. J., & Auton, J. C. (2015). The merits of measuring challenge and hindrance appraisals. *Anxiety, Stress, and Coping*, 28(2), 121–143. <https://doi.org/10.1080/10615806.2014.931378>
- Semmer, N. K., Zapf, D., & Dunckel, H. (1999). Instrument zur Stressbezogenen Tätigkeitsanalyse ISTA [Instrument for the analysis of typical stress-related work characteristics ISTA]. In H. Dunckel (Ed.), *Handbuch psychologischer Arbeitsanalyseverfahren* (pp. 179–204). vdf Hochschulverlag.
- Smith, R. W., DeNunzio, M. M., Haynes, N. J., & Thiele, A. (2022). The importance of appraisal in stressor–well-being relationships and the examination of personality traits as boundary conditions. *Journal of Managerial Psychology*, 37(5), 425–443. <https://doi.org/10.1108/JMP-11-2019-0649>
- Sonnentag, S., Binnewies, C., & Mojza, E. J. (2008). “Did you have a nice evening?” A day-level study on recovery experiences, sleep, and affect. *Journal of Applied Psychology*, 93(3), 674–684. <https://doi.org/10.1037/0021-9010.93.3.674>
- Sonnentag, S., & Frese, M. (2013). Stress in organizations. In I. B. Weiner (Ed.), *Handbook of psychology*. Wiley. <https://doi.org/10.1002/0471264385.wei1218>
- Sonnentag, S., Pundt, A., & Albrecht, A.-G. (2014). Temporal perspectives on job stress. In A. J. Shipp & Y. Fried (Eds.), *Time and work: How time impacts individuals* (Vol. 1, pp. 111–140). Psychology Press.
- Sonnentag, S., Reinecke, L., Mata, J., & Vorderer, P. (2018). Feeling interrupted – Being responsive: How online messages relate to affect at work. *Journal of Organizational Behavior*, 39(3), 369–383. <https://doi.org/10.1002/job.2239>
- Swiss Federal Statistical Office. (2021a). Arbeitsmarktstatus nach Geschlecht. In *Nationalität, Altersgruppen, und Familientyp [job market characterized by gender, nationality, age, and family type]* (Schweizerische Arbeitskräfteerhebung SAKE). Bundesamt für Statistik (Schweiz). <https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken/tabellen.assetdetail.21825561.html>
- Swiss Federal Statistical Office. (2021b). Durchschnittliches Alter der Erwerbsbevölkerung. In *2021 [average age of the work force, 2021]* (Erwerbstätigenstatistik ETS). Bundesamt für Statistik (Schweiz). <https://www.bfs.admin.ch/bfs/de/home/statistiken/arbeit-erwerb/erwerbstaetigkeit-arbeitszeit/alter-generationen-pensionierung-gesundheit/durchschnittsalter-erwerbsbevölkerung.html>
- Swiss Federal Statistical Office. (2022). *Verteilung der Erwerbstätigen in der Schweiz nach Wirtschaftssektoren von 2010 bis 2020 [Distribution of participants in the labor market over industry sectors]* (Erwerbstätigenstatistik, ETS). Bundesamt für Statistik (Schweiz). <https://de.statista.com/statistik/daten/studie/216757/umfrage/erwerbstaeetige-nach-wirtschaftssektoren-in-der-schweiz/#professional>
- Tuckey, M. R., Searle, B. J., Boyd, C. M., Winefield, A. H., & Winefield, H. R. (2015). Hindrances are not threats: Advancing the multidimensionality of work stress. *Journal of Occupational Health Psychology*, 20(2), 131–147. <https://doi.org/10.1037/a0038280>
- Venz, L., Pundt, A., & Sonnentag, S. (2018). What matters for work engagement? A diary study on resources and the benefits of selective optimization with compensation for state work engagement. *Journal of Organizational Behavior*, 39(1), 26–38. <https://doi.org/10.1002/job.2207>
- Wajcman, J., & Rose, E. (2011). Constant connectivity: Rethinking interruptions at work. *Organization Studies*, 32(7), 941–961. <https://doi.org/10.1177/0170840611410829>
- Wanberg, C. R., Zhu, J., & Van Hooft, E. A. J. (2010). The job search grind: Perceived progress, self-reactions, and self-regulation of search effort. *Academy of Management Journal*, 53(4), 788–807. <https://doi.org/10.5465/AMJ.2010.52814599>
- Warr, P. (1999). Well-being and the workplace. In *Well-being: The foundations of hedonic psychology* (pp. 392–412). Russell Sage Foundation.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070. <https://doi.org/10.1037/0022-3514.54.6.1063>
- Weiss, H. M., & Rupp, D. E. (2011). Experiencing work: An essay on a person-centric work psychology. *Industrial and Organizational Psychology—Perspectives on Science and Practice*, 4(1), 83–97. <https://doi.org/10.1111/j.1754-9434.2010.01302.x>
- Wilkes, S. M., Barber, L. K., & Rogers, A. P. (2018). Development and validation of the workplace interruptions measure. *Stress and Health*, 34(1), 102–114. <https://doi.org/10.1002/smi.2765>
- Williams, L. J., Vandenberg, R. J., & Edwards, J. R. (2009). 12 structural equation modeling in management research: A guide for improved analysis. *Academy of Management Annals*, 3(1), 543–604. <https://doi.org/10.5465/19416520903065683>

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, 26(2), 179–201. <https://doi.org/10.2307/259118>

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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