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RESEARCH ARTICLE

# Drammatic breaks: Break recovery experiences as mediators between job demands and affect in the afternoon and evening

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## Abstract

The present study focused on within-workday recovery, which has received less scholarly attention than has recovery outside work. We examined six break recovery experiences (detachment, relaxation, autonomy, mastery, meaning and affiliation) as possible mediators between daily emotional job demands, positive and negative affect both in the afternoon and in the evening. We conducted a one-work week diary study ($N = 107$) among Finnish schoolteachers with three daily measurements per workday. Most participants (88%) were women, and the average age was 50 years. The data were analysed with multilevel path modelling. Regarding daily afternoon affect, both low break detachment and low break meaning mediated the relationship between high daily emotional demands and low afternoon positive affect and high afternoon negative affect. Regarding daily evening affect, only low break meaning mediated the relationship between high daily emotional demands and low evening positive affect. In addition, afternoon positive and negative affect did mediate the relationships between break detachment and meaning and positive and negative evening affect. Our findings offer new insights into the interplay of daily job demands, break recovery experiences and affective well-being. Despite detachment, meaning, which has received limited research attention as a recovery experience, seems to play an important role in within-workday recovery. Our study also suggests that successful break recovery can benefit employees' affective well-being in the evening.

KEYWORDS
affective well-being, breaks, diary study, recovery from work, recovery experiences

## 1 | INTRODUCTION

Recovery from work protects against the harmful effects of high job demands on employee well-being (Geurts & Sonnentag, 2006; Sonnentag et al., 2017). It refers to the process of alleviating strain symptoms caused by job demands (Sonnentag & Fritz, 2015) and restoring employees' energetic and mental resources (Zijlstra & Sonnentag, 2006). Although most people spend a third to a half of their waking hours at work, within-working day recovery, also called *internal recovery*, has been studied less extensively than external recovery occurring outside working hours (see Sonnentag et al., 2017, for a review). However, internal recovery has received increasing

research attention during the recent years. Breaks are defined as an episode of the working day during which employees shift their attention away from work tasks (Hunter & Wu, 2016). The available evidence on breaks and employee well-being has been summarized in the following points (Sianoja et al., 2015; Sonnentag et al., 2017). First, breaks at work benefit employees' health and well-being. Second, breaks are especially beneficial when they can be taken at a point of heightened fatigue. Third, positive affect and engagement in relaxing or social activities increase the recovery potential of breaks, while engagement in compulsory chores diminishes it (see also; Kim et al., 2017; Trougakos et al., 2008). However, psychological recovery experiences during breaks have received limited attention in research so far.

Besides simply taking a break, break activities and psychological experiences (e.g., relaxation) can increase the recovery potential of a break. Previous research has shown that successful recovery during breaks can prevent the accumulation of stress and thus help maintain positive mood, energy and productivity throughout working day (e.g., Kühnel et al., 2017; Trougakos et al., 2008; Von Dreden & Binnewies, 2017). Recent findings also imply that recovery during the working day is related to well-being thereafter. There is some evidence suggesting that a favourable recovery state at the end of the working day has a positive effect on employees' recovery processes in the evening (Van Hooff & de Pater, 2017; Van Hooff & Geurts, 2014). This is important, given that successful recovery from work during off-job hours is consistently related to higher well-being (e.g., Sonnentag et al., 2017). A longitudinal study by Sianoja and colleagues (2016) suggests that successful lunch-time recovery may even have long-term consequences such as higher energy levels one year later. In addition, if employees end their working day without feeling completely exhausted, it is possible that they have more energy left to enjoy their leisure time and engage in recovery-promoting activities in the evening. Even though successful recovery replenishes resources (Hobfoll, 1989), some resources may also be needed in order to engage in recovery-promoting activities such as physical exercise (Sonnentag & Jelden, 2009).

In the present study, we focused on schoolteachers. Teachers' work offers a fruitful starting point to examine internal recovery as, in addition to lunch breaks, Finnish schoolteachers have structured breaks between classes, which, at least in principle, should provide them with opportunities to recover. Therefore, in this study, we focused on all within-workday breaks lasting at least five minutes (i.e., excluding the shortest micro-breaks) to extend earlier research which has focused on either only one break type, typically lunch breaks (e.g., Krajewski et al., 2010; Sianoja et al., 2016; Sianoja et al., 2018; Trougakos et al., 2008; Trougakos et al., 2014) or very short micro-breaks (e.g., de Bloom, Kinnunen, & Korpela, 2015; Hunter & Wu, 2016; Kim et al., 2017; Kühnel et al., 2017). We focused specifically on psychological recovery experiences during these breaks, as these experiences expedite recovery (Sonnentag & Fritz, 2007, 2015).

Teaching is a stressful occupation with high job demands and burnout rates (e.g., Arvidsson et al., 2016; Kyriacou, 2001; Skaalvik & Skaalvik, 2015; 2017) and is especially emotionally demanding: Teachers frequently face stressors related to interactions with pupils, colleagues or parents (e.g., Bauer, 2007; Skaalvik & Skaalvik, 2017; Unterbrink et al., 2008). Emotional demands related to social interactions tend to be negatively related to occupational well-being (e.g., Hülsheger & Schewe, 2011; Scheibe, Stamov-Roßnagel, & Zacher, 2015) and are likely to be a challenge in terms of recovery from work during breaks. It is therefore possible that break recovery experiences act as underlying mechanisms in the relationship between high job demands and lower well-being as shown in earlier research on off-job recovery (Bennett et al., 2018; Kinnunen et al., 2011).

Using a one-work week diary design in a sample of Finnish schoolteachers, the aim of this study is to contribute to recovery research in three ways. Firstly, we examine six recovery experiences suggested by the recently developed Detachment, Relaxation, Autonomy, Mastery, Meaning, and Affiliation (DRAMMA) model (Newman et al., 2014) in the context of teachers' breaks during the working day. Accordingly, we extend existing research, which has not examined these break experiences together. Secondly, we investigate how recovery experiences during breaks relate to positive and negative affect both in the afternoon and in the evening as it is important to know whether successful working day recovery promotes well-being after work and in the evening. Affects have frequently been studied in the context of recovery from work, also during breaks, as negative or positive affect is a common short-term reaction to daily work demands (see, e.g., Kim et al., 2017; Rhee & Kim, 2016; Trougakos et al., 2014). Affects are also related to longer-term well-being outcomes such as job satisfaction (e.g., Judge & Ilies, 2004; Moè et al., 2010) and life satisfaction (e.g., Extremera & Rey, 2016; Kuppens et al., 2008). Nevertheless, none of these studies has focused on the relations of all six DRAMMA experiences with negative and positive affect. Thirdly, we focus on the role of recovery experiences as mediators between daily emotional demands and affect in the afternoon and in the evening. Our study therefore provides novel insights into teachers' daily recovery processes, which are mostly unexamined. Long-term negative consequences of insufficient recovery result from incomplete day-to-day recovery (e.g., Geurts & Sonnentag, 2006), which is why it is important to study recovery from a short-term perspective, such as in the form of a daily diary study like ours.

## 1.1 | The DRAMMA model and the theoretical background of recovery experiences

In the present study, we approached recovery by focussing on the processes aiding recovery, that is, on recovery experiences (Sonnentag & Fritz, 2007, 2015). These are psychological recovery-promoting experiences which underlie different recovery activities. The main theoretical framework of this study is the DRAMMA model, which aims to explain how and in what circumstances leisure enhances subjective well-being (Newman et al., 2014). Drawing on a

meta-analysis of 363 studies within psychology and leisure sciences, Newman and colleagues integrated various theories on subjective well-being in order to establish a conceptual model concerning psychological experiences which promote well-being.

The DRAMMA model suggests six recovery experiences: detachment from work, relaxation, autonomy, mastery, meaning, and affiliation. In an earlier, widely used framework Sonnentag and Fritz (2007) suggested four recovery experiences: detachment, relaxation, control, and mastery. *Detachment from work* refers to disengagement from work-related thoughts. *Relaxation* implies low levels of mental or physical activation and little physical or intellectual effort. These experiences have their main theoretical basis on the Effort-Recovery Model, which suggests that recovery occurs when employees stop working and rest, which allows their psychobiological systems to return to pre-stressor levels (Meijman & Mulder, 1998). Both these experiences fulfil this condition. Detachment and relaxation help to reduce activation, which is important because prolonged activation of a person's psychobiological systems due to inadequate recovery is detrimental to well-being in the long term (Brosschot et al., 2006; McEwen, 1998; Ursin & Eriksen, 2004). *Autonomy (control)* refers to being able to decide on one's schedule and activities outside work. Having autonomy over one's life can be seen as a basic psychological need in Self-Determination Theory (SDT, Ryan & Deci, 2000). *Mastery* encompasses learning opportunities and challenges resulting in feelings of achievement and competence outside the work domain. Engaging in challenging but also rewarding activities allows employees to replenish their depleted or lost personal resources (Hobfoll, 1989), experience flow (Csikszentmihalyi, 1990) and self-efficacy (Bandura, 1997). These four recovery experiences during free time have been shown to promote well-being (see the meta-analysis by Bennett et al., 2018), although detachment has received most research attention (Sonnentag et al., 2017; Wendsche & Lohmann-Haislah, 2017) and has been labelled the most powerful recovery experience (Sonnentag, 2018).

The DRAMMA model also contains two new elements compared to Sonnentag and Fritz's recovery experiences: meaning and affiliation, *Meaningful* leisure activities are a means by which people gain something important or valuable in their life (Iwasaki, 2008). Particularly in leisure sciences, searching for and finding meaning are seen as key elements of leisure and quality of life in general (e.g., Iwasaki et al., 2018; Loveday et al., 2018). Meaningful leisure activities help individuals gain a sense of purpose in their lives (e.g., Iwasaki, 2008), which is beneficial for well-being (e.g., Machell et al., 2015; Thrash et al., 2010). Also, on daily level, searching for meaning is related to higher well-being (Newman et al., 2018). *Affiliation* refers to feelings of relatedness with other people, which is considered an innate psychological need following SDT theory (Ryan & Deci, 2000) and fosters social support, which helps people to cope with stressful events (Lakey & Orehek, 2011).

All in all, the DRAMMA model combines the perspectives of recovery from work and satisfaction of more general psychological needs. Some recovery experiences—autonomy, mastery, and affiliation—largely correspond to the basic needs suggested by SDT theory (Ryan & Deci, 2000), which implies that the fulfilment of three basic psychological needs (i.e., autonomy, competence and relatedness) is essential for our well-being. Also, a few recent studies show that basic needs satisfaction contributes to recovery from work (Mojza et al., 2011; Van Hooff et al., 2018; Van Hooff & Geurts, 2014). According to Van Hooff et al. (2018), there are several reasons why need satisfaction and recovery are closely related. Firstly, SDT theory suggests that need satisfaction results in energy maintenance and enhancement (Ryan & Deci, 2008), which facilitates the recovery process. Secondly, need satisfaction tends to be accompanied by positive emotions (Reis et al., 2000; Sheldon, Ryan, & Reis, 1996), which help to downregulate stress (Esch & Stefano, 2004). Thirdly, according to the Broaden-and-Build Theory, positive emotions linked to affiliation broaden our thought-action repertoires (Fredrickson, 2001), which helps people to increase their resources, for instance by engaging in behaviours that promote recovery.

Until now, most earlier studies have examined recovery experiences during time outside work. Only few recent studies have also investigated recovery experiences in the context of within-workday breaks. Several longitudinal, diary and cross-sectional studies suggest that detachment from work during breaks is related to favourable recovery outcomes, such as positive affect, vigour, lower exhaustion and lower need for recovery (e.g., Coffeng et al., 2015; Kinnunen et al., 2019; Rhee & Kim, 2016; Sianoja et al., 2016; Von Dreden & Binnewies, 2017). In addition, earlier diary studies and intervention studies show that relaxation during breaks can contribute to improved well-being (e.g., Bosch et al., 2018; de Bloom et al., 2017; Krajewski et al., 2011; Sianoja et al., 2018). There is also evidence concerning the beneficial role of autonomy (or control) during breaks (Bosch et al., 2018; Sianoja et al., 2016; Trougakos et al., 2014). Affiliation has not been studied much in the context of breaks. Bosch et al. (2018) found that relatedness during lunch breaks predicted lower exhaustion and higher work engagement in the afternoon. Also, positive humour with colleagues during breaks, which is likely to foster social support and affiliation, has been shown to buffer against the effect of high job demands on affective outcomes (Scheel, Putz, & Kursawa, 2017). By contrast, as far as we know, no evidence on the role of experiences of mastery and meaning during breaks has so far been presented.

In this study, we therefore extend the knowledge available by investigating all six break recovery experiences together as mediators in the relationship between emotional job demands and affective well-being, which is a new approach to recovery during the working day.

## 1.2 | Recovery experiences as mediators between emotional job demands and affective well-being

It is especially important to recover from work when job demands are high (e.g., Sonnentag, 2018). The negative relationship between high

demands and well-being can be explained by means of the health impairment process in the Job Demands-Resources (JD-R) model (e.g., Bakker & Demerouti, 2017). In this process, high or long-lasting job demands may over time lead to the depletion of energy and result in fatigue and burnout. The JD-R model has also been applied in the context of recovery (e.g., Bennett et al., 2018; Kinnunen et al., 2011). Studies have shown, for example, that high job demands inhibit recovery experiences (Bennett et al., 2018). In the present study, we focus on daily emotional job demands, which are a prominent source of job stress among teachers (e.g., Bauer, 2007; Skaalvik & Skaalvik, 2017; Unterbrink et al., 2008). The most frequently reported emotionally charged stressors in their jobs include managing pupils' behavioural problems, verbal insults, and interpersonal conflicts. Thus, these situations arouse emotions which have to be dealt with, needing effort.

We can expect that when teachers have encountered emotionally challenging demands in their work, they may have difficulties in detaching from work or feeling relaxed during breaks as they may ruminate and continue thinking about these demanding situations. It is also quite probable that due to depleted energy levels they may lack the energy for mastery experiences during breaks. Also, engaging in activities that produce experiences of meaning can take some effort and focus. For example, a study by Waterman (2005) showed that preferred high-effort activities were associated with higher self-realization and importance (among several variables related to well-being and meaning) than preferred low-effort activities. Therefore, it is possible that when teachers' energy levels and cognitive resources have been depleted by emotional demands, they find it more difficult to focus on meaning-promoting activities during breaks. Emotional demands may also impair experiences of autonomy during breaks, for example, by decreasing break time or by cognitive preoccupation with work demands during breaks. Due to emotional demands teachers may also feel in need for recovery which is actualized with social withdrawal during breaks (van Veldhoven & Broersen, 2003). As a consequence, they may feel less affiliation. There are a few earlier diary studies showing that daily emotional stress is related to lower levels of detachment and relaxation (Schraub et al., 2013). Based on this reasoning, and the JD-R theory, our first hypothesis is:

**Hypothesis 1** *Higher daily emotional job demands are related to lower levels of recovery experiences* (i.e., *detachment*, *relaxation*, *autonomy*, *mastery*, *meaning*, *and affiliation*) *during breaks.*

Second, we were interested in the direct relationship between emotional demands and affective well-being in the afternoon and in the evening. From earlier studies we know that emotional demands or emotional labour are related to poorer well-being among teachers (Kinman et al., 2011; Philipp & Schupbach, 2010), but to the best of our knowledge, no studies have so far examined the effects of day-level emotional demands specifically among teachers. However, a link between daily emotional demands and emotional well-being has been found among other occupational groups, such as service workers (see, e.g., Biron & Van Veldhoven, 2012). We expand the existing research by investigating daily emotional job demands and their relationship to affective well-being, concerning people's feelings, more formally described as affect (Warr, 2012). We predict that:

**Hypothesis 2** *Higher daily emotional job demands are related to lower positive affect and higher negative affect in the afternoon* (H2a) *and in the evening* (H2b).

Third, we examined the direct relationships between break recovery experiences and affective well-being in the afternoon and in the evening. Several earlier findings suggest that detachment (e.g., Coffeng et al., 2015; Kinnunen et al., 2019; Rhee & Kim, 2016; Sianoja et al., 2016; Von Dreden & Binnewies, 2017), relaxation (e.g., Bosch et al., 2018; de Bloom et al., 2017; Krajewski et al., 2011; Sianoja et al., 2018), and autonomy (or control) (Bosch et al., 2018; Sianoja et al., 2016; Trougakos et al., 2014) during breaks are related to improved well-being. Also, at least one study (Bosch et al., 2018) found a link between affiliation during breaks and better well-being in the afternoon. Although no evidence on the role of experiences of mastery and meaning during breaks has so far been presented, they can be presumed to replenish threatened resources, which is related to favourable outcomes (e.g., Hobfoll, 1989; Newman et al., 2014; Sonnentag & Fritz, 2007). For example, a recent experience-sampling study by Chawla and colleagues highlights the role of leisure-time mastery in predicting positive work behaviours, such as productivity, the next day (Chawla et al., 2020). Although affective well-being has often been examined as an outcome of internal recovery (see, e.g., Kim et al., 2017; Rhee & Kim, 2016; Trougakos et al., 2014), these studies have not focused on all six DRAMMA experiences. Therefore, we hypothesize that:

**Hypothesis 3** *Break recovery experiences* (i.e., *detachment*, *relaxation*, *autonomy*, *mastery*, *meaning*, *and affiliation*) *are related to higher positive affect and lower negative affect in the afternoon* (H3a) *and in the evening* (H3b).

Theoretically, recovery experiences are considered mediators between job demands and well-being (Bennett et al., 2018; Demerouti et al., 2009; Kinnunen et al., 2011). This is especially evident when one considers how the recovery process unfolds on a daily basis. In addition to theoretical perspectives, empirical studies suggest that leisure-time recovery experiences mediate the relationship between job demands and well-being (see, e.g., for a meta-analysis, Bennett et al., 2018; Kinnunen et al., 2011). Of recovery experiences, detachment has been most often studied as a mediator (Chen et al., 2017; Germeys & De-Gieter, 2016; Chen & Li, 2019; Kinnunen et al., 2011). Also, relaxation has been found to mediate the relationship between emotional stress and affective well-being (Schraub et al., 2013). A meta-analysis by Bennett et al. (2018) showed that in addition to detachment and relaxation, also control, and mastery mediate the relationship between job demands and well-being. However, these studies focused on recovery experiences

*after* working hours. To the best of our knowledge, no earlier studies have investigated break recovery experiences as mediators between daily job demands and well-being outcomes. In addition, the role of meaning and affiliation in this mediation process still remains to be investigated.

We expect that all six recovery experiences during breaks can function as mediators in the relationship between emotional job demands and afternoon and evening affect. High emotional demands at work can prevent these experiences during breaks (see Hypothesis 1), which in turn may result in less positive affect and more negative affect in the afternoon and in the evening (see Hypothesis 3). Therefore, we hypothesize that:

**Hypothesis 4** *Recovery experiences* (i.e., *detachment*, *relaxation*, *autonomy*, *mastery*, *meaning*, *and affiliation*) *mediate the relationship between daily emotional demands and positive and negative affect in the afternoon* (H4a) *and in the evening* (H4b).

We assumed that all hypothesized relations (Hypothesis 2–Hypothesis 4) are more probable in relation to afternoon affect than evening affect, because the afternoon is closer in time to the occurrence of emotional job demands and break recovery experiences.

## 2 | METHODS

### 2.1 | Participants

The majority of the participants were recruited from the sample of a cross-sectional questionnaire study among Finnish schoolteachers, which was conducted in May 2017. Participants of the cross-sectional study were asked whether they would be willing to take part in the diary study during autumn 2017. Of the whole sample of 909 teachers, 208 (22.9%) agreed. To ensure participation in the diary study, we approached these 208 teachers via email in autumn 2017. We asked for their postal addresses to send the diary questionnaires, and also asked their permission to combine their background information from the cross-sectional questionnaire in order to avoid asking the same questions again. In addition, we recruited more participants from one municipality with the help of their school administration. All in all, 114 teachers provided their contact information, 108 were participants of the earlier study and six were newly recruited participants.

The final number of participants returning the diary questionnaires was 107. The average age of the participants was 50 years (SD = 8.9), and only 20% were under 45 years old. The relatively high mean age was due to the sample selection: the cross-sectional questionnaire study focused on the role of ageing in recovery, hence the sample included a greater share of older teachers than the general working population of Finnish teachers. Half (52%) of the participants were class teachers (teaching pupils aged 7 to 12 years) or special education teachers, 37% were specialized subject teachers, and 10% were school head teachers. Almost all the participants (93%) worked in comprehensive schools (teaching pupils aged 7 to 16), and the rest worked in upper secondary schools (teaching pupils aged 17 to 19). Most of the participants (88%) were women. The mean number of working hours per week was 37.2 (SD = 8.0). When comparing the participants with those of the cross-sectional questionnaire study, they seemed to be similar in terms of their background factors.

### 2.2 | Study design

Before the actual diary study, participants answered an electronic background questionnaire. Informed consent was included at the beginning of the background questionnaire. We also informed the participants about the study objectives, assured them that their responses would be treated confidentially, and that participation was voluntary. The diary study was conducted in November 2017 during three different weeks (according participants' preferences). The study period lasted five days, from Monday to Friday during a regular working week. On these days, participants filled in three daily paper-and-pencil diary questionnaires: one in the morning before going to work, the second around 16 in the afternoon (regardless of whether their workday had ended), and the third in the evening before going to sleep. The average time for completing the daily questionnaires in the morning ranged between 6:57 and 7:15, in the afternoon between 16:17 and 16:37 and in the evening/night between 19:25–1:28. We also sent the participants text message reminders to fill in the questionnaires on each measurement day at 7:30, at 16:00 and at 21:30.

## 3 | MEASURES

### 3.1 | Daily emotional job demands

Daily *emotional job demands* were measured in the afternoon questionnaire with three items from the COPSOQ II (Pejtersen et al., 2010) adapted to the current working day (e.g., 'Today my work was emotionally demanding', Cronbach's $\alpha$ = 0.81–0.90). The items were rated on a scale from 1 to 5 (1 = totally disagree, 5 = totally agree).

### 3.2 | Break recovery experiences

Recovery experiences during breaks were measured in the afternoon questionnaire with eight items referring to all breaks during the working day with a minimum duration of five minutes. The measures of detachment, relaxation, autonomy, and mastery were from the state version of the Recovery Experience Questionnaire (Bakker et al., 2015). *Detachment* from work (e.g., 'I distanced myself from work'; $\alpha$ = 0.83–0.90) and *relaxation* (e.g., 'I did relaxing things'; $\alpha$ = 0.81–0.87) were assessed with two items each. *Autonomy* was

measured with one item: 'I determined for myself how I spent my time'. Although strictly speaking this is originally a measure of control, we consider control and autonomy so similar in the context of breaks but we adhere to the concept of autonomy, which is in line with the DRAMMA framework. *Mastery* was also assessed with one item: 'I did something to broaden my horizons'. *Meaning* was measured with one item ('I did something which was important to me personally'; adapted from Butler & Kern, 2016; Schulenberg et al., 2011). Finally, *affiliation* was measured with one item ('I felt connected [belonging] with other people') adapted from the work-related basic needs satisfaction scale (van den Broeck et al., 2010). The rating scale for all recovery experience items was from 1 to 5 (1 = totally disagree, 5 = totally agree). The choice of one-item measures was based on their factor loadings in earlier studies (for the Recovery Experience Questionnaire (developed by Sonnentag & Fritz, 2007) items, see Bakker et al., 2015; Kinnunen et al., 2011; Sonnentag & Fritz, 2007; for meaning, see Butler & Kern, 2016; for affiliation, see van den Broeck et al., 2010) and the content of the item, so that the item would depict the concept (i.e., recovery experience) as clearly and unequivocally as possible.

### 3.3 | Affective well-being: positive and negative affect

Affect was assessed in all daily questionnaires: in the morning (used as a control in the analyses), in the afternoon, and in the evening. Affect was measured with seven adjectives (or pairs of adjectives, e.g., calm/relaxed) always referring to right now: calm/relaxed, fatigued/tired, enthusiastic, irritable, energetic/vigorous, tense, and gloomy. These items were based on Warr's (1990) framework and rated on a scale from 1 to 7 with three verbal anchors 1 = not at all, 4 = to some extent, 7 = very much. For the analyses these items were combined into averaged variables of *positive affect* (calm/relaxed, enthusiastic, energetic/vigorous; $\alpha$ = 0.56–0.90) and *negative affect* (fatigued/tired, irritable, tense, gloomy; $\alpha$ = 0.75–0.90) concerning morning, afternoon and evening.

### 3.4 | Workload

We used workload as a control variable as it is known to be related to affect (e.g., Ilies et al., 2010; Ilies et al., 2007). Workload was assessed with three items adapted to daily level from Spector and Jex (1998) (e.g., 'Today there was a great deal to be done' $\alpha$ = 0.79–0.89). The items were rated on a scale from 1 to 5 (1 = totally disagree, 5 = totally agree).

### 3.5 | Statistical approach

Daily measurements were nested within individuals. Multi-level path modelling with ML estimation in Mplus 7.4 (Muthén & Muthén, 2015) was used to test all hypotheses and account for the nested structure of the data. Intra-class correlations confirmed that 37% to 65% of the variance in the study variables was on the day-level (within individuals). Thus, intra-class correlations justified using a multi-level approach to analyse the data.

All variables included in the analyses contained variance at Level 1 (i.e., within-person: $N$ = 514–532 daily measurements) and Level 2 (i.e., between-person: $N$ = 107 participants). Associations between variables were modelled on the within-level and thus the predictor in our model (i.e., emotional demands) and our control variables, daily workload and morning positive and negative affect, were person-mean cenered (see also Ohly et al., 2010). All other variables were either outcome variables or mediators and were thus not centred (cf. Aguinis et al., 2013).

Hypotheses 1–3 were tested in one multi-level model and all predictors were added as fixed effects. In the first model, pathways from emotional job demands to the six break recovery experiences were modelled in addition to pathways from break recovery experiences to positive and negative affect in the afternoon. Next, pathways from the six break recovery experiences to positive and negative affect in the evening were added to the model as well as pathways from positive affect in the afternoon to positive affect in the evening and from negative affect in the afternoon to negative affect in the evening. Lastly, pathways from the control variable workload to all afternoon and evening affect outcomes were modelled, likewise pathways from morning positive and negative affect to all afternoon affect outcomes. As Pindek et al. (2015) argue, it is important to consider both the within level and between level. So, we modelled the pathways from afternoon positive and negative affect to evening affect on the between level. If the requirements for mediation were fulfilled (c.f. Hayes, 2009; 2013), we tested Hypothesis 4 by calculating the indirect effects and their 95% confidence intervals (CI) with Bayesian estimation in Mplus 7.4 (using default starting values and iterations). If the CI excludes zero, then the indirect effect is considered statistically significant at the 0.05 level. We assessed model fit with the root mean square error of approximation (RMSEA) comparative fit index (CFI), and standardized the root mean square residual (SRMR). RMSEA values below 0.07, CFI values above 0.95 and SRMR values below 0.08 indicate acceptable model fit (Hu & Bentler, 1999; Steiger, 2007).

## 4 | RESULTS

### 4.1 | Descriptive statistics

Means, standard deviations, and intra-class correlations are presented in Table 1. As can be seen in Table 1, of the break recovery experiences, affiliation was rated on average highest, whereas detachment was rated lowest. As expected, daily emotional job demands and workload appeared to be high in teachers. The average duration of lunch break among participants was 17.55 min (SD = 6.22) and on 68% of the days teachers spent lunchtime with

**TABLE 1** Within-and between-level means, standard deviations and intra-class correlations of study variables

| | $M_{between}$ | $SD_{between}$ | $ICC_{between}$ | $M_{within}$ | $SD_{within}$ | $ICC_{within}$ |
|---|---|---|---|---|---|---|
| Age (in years) | 50.20 | 8.85 | | | | |
| Workload (1–5) | 3.44 | 0.81 | 0.50 | 3.44 | 1.03 | 0.50 |
| Morning PA (1–7) | 3.71 | 1.00 | 0.54 | 3.70 | 1.25 | 0.46 |
| Morning NA (1–7) | 2.57 | 1.00 | 0.47 | 2.58 | 1.20 | 0.53 |
| Emotional demands (1–5) | 2.94 | 0.83 | 0.43 | 2.94 | 1.12 | 0.57 |
| (D) Break detachment (1–5) | 1.64 | 0.68 | 0.44 | 1.64 | 0.89 | 0.56 |
| (R) Break relaxation (1–5) | 2.30 | 0.81 | 0.41 | 2.31 | 1.07 | 0.59 |
| (A) Break autonomy (1–5) | 2.68 | 1.02 | 0.43 | 2.69 | 1.35 | 0.57 |
| (M) Break mastery (1–5) | 1.97 | 0.82 | 0.35 | 1.99 | 1.16 | 0.65 |
| (M) Break meaning (1–5) | 2.83 | 0.95 | 0.44 | 2.86 | 1.25 | 0.56 |
| (A) Break affiliation (1–5) | 3.43 | 0.82 | 0.38 | 3.44 | 1.11 | 0.62 |
| Afternoon PA (1–7) | 3.48 | 0.83 | 0.36 | 3.52 | 1.17 | 0.64 |
| Afternoon NA (1–7) | 2.90 | 0.95 | 0.47 | 2.90 | 1.24 | 0.53 |
| Evening PA (1–7) | 3.35 | 0.71 | 0.39 | 3.35 | 0.99 | 0.61 |
| Evening NA (1–7) | 2.82 | 0.90 | 0.63 | 2.83 | 1.07 | 0.37 |

Abbreviations: ICC, intra-class correlation; *M* = mean; NA, negative affect; PA, positive affect; SD, standard deviation

their pupils. In addition to the lunch break, teachers had on average 2.07 (SD = 0.63) breaks during their working day and the longest break (excluding lunch break) averaged around 10.46 min (SD = 8.11). Finally, a repeated measures ANOVA showed that positive affect ($F$ [1.79, 189.35] = 12.62, $p < 0.001$) and negative affect ($F$ [1.25, 132.14] = 20.54, $p < 0.001$) changed significantly during the day. Post hoc tests using the Bonferroni correction showed that positive affect decreased from morning ($M$ = 3.71, SD = 1.00) to afternoon ($M$ = 3.48, SD = 0.83), but positive afternoon and evening affect ($M$ = 3.35, SD = 0.71) did not statistically differ ($p$ = 0.081). Negative affect did increase significantly from morning ($M$ = 2.57, SD = 1.00) to afternoon ($M$ = 2.90, SD = 0.95), whereas it decreased again from afternoon to evening ($M$ = 2.82, SD = 0.90).

Within-level and between-level correlations of the study variables are presented in Table 2. On the within level, all break recovery experiences correlated positively with positive affect and negatively with negative affect in the afternoon. However, meaning was the only recovery experience which also correlated negatively with negative affect in the evening. Both detachment and meaning correlated positively with positive affect in the evening. Daily emotional demands correlated negatively with all break recovery experiences except affiliation or mastery. Daily emotional demands correlated negatively with positive affect in the afternoon and in the evening and positively with negative affect in the afternoon and in the evening. Mostly correlations were similar on the between level, with three exceptions: break mastery did not correlate significantly with affective outcomes, break meaning did not correlate with evening negative affect, and emotional demands did not correlate with break relaxation between individuals.

In describing our results, we report standardized estimates whenever possible. The multi-level model fitted the data well ($\chi^2$ [32] = 37.069, CFI = 0.997, RMSEA = 0.017, $SRMR_{within}$ = 0.034, $SRMR_{between}$ = 0.034). A visualization of all significant within-level results is presented in Figure 1.

## 4.2 | Daily emotional job demands in relation to break recovery experiences

First, we examined whether daily emotional job demands were associated with break recovery experiences during the same day. All direct effects between study variables in multi-level models are presented in Table 3. The results showed that daily emotional job demands were indeed related to low levels of break detachment ($\gamma$ = −0.10, SE = 0.04, $p < 0.05$), relaxation ($\gamma$ = −0.11, SE = 0.04, $p < 0.05$), and meaning ($\gamma$ = −0.10, SE = 0.04, $p < 0.05$). Emotional job demands were not associated with break autonomy ($\gamma$ = −0.08, SE = 0.04, $p$ = 0.060), mastery ($\gamma$ = −0.06, SE = 0.05, $p$ = 0.155) or affiliation ($\gamma$ = −0.07, SE = 0.04, $p$ = 0.103). These results lent partial support to Hypothesis 1.

## 4.3 | Daily emotional job demands, break recovery experiences and afternoon affect

We expected daily emotional job demands to predict subsequent afternoon positive and negative affect. The results (see Figure 1, Table 3) revealed that emotional job demands were negatively related to positive affect in the afternoon ($\gamma$ = −0.20, SE = 0.04,

**TABLE 2** Within- and between-level correlations of the study variables

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Gender | −0.17 | −0.06 | −0.01 | 0.10 | 0.02 | 0.35** | 0.36** | 0.21* | 0.04 | 0.22* | 0.01 | 0.08 | −0.01 | −0.05 | 0.20* |
| 2. Age | | 0.11 | 0.07 | 0.07 | 0.07 | −0.24* | −0.36** | −0.35** | −0.10 | −0.23* | −0.17 | 0.02 | 0.11 | 0.08 | 0.03 |
| 3. Workload | | | −0.39** | 0.58** | 0.60** | −0.40** | −0.38** | −0.34** | 0.11 | −0.14 | −0.14 | −0.60** | 0.67** | −0.57** | 0.59** |
| 4. Morning PA | | −0.03 | | −0.77** | −0.42** | 0.33** | 0.32** | 0.28* | 0.20 | 0.50** | 0.47** | 0.81** | −0.61** | 0.71** | −0.51** |
| 5. Morning NA | | 0.04 | −0.64** | | 0.64** | −0.35** | −0.29** | −0.28* | −0.08 | −0.36** | −0.49** | −0.68** | 0.93** | −0.65** | 0.90** |
| 6. Emotional demands | | 0.37** | −0.05 | 0.06 | | −0.24* | −0.06 | −0.24* | 0.05 | −0.11 | −0.26* | −0.53** | 0.74** | −0.48** | 0.63** |
| 7. (D)Break detachment | | −0.26** | −0.01 | −0.01 | −0.16** | | 0.69** | 0.64** | 0.44** | 0.41** | 0.35** | 0.45** | −0.39** | 0.32** | −0.24* |
| 8. (R)Break relaxation | | −0.29** | 0.03 | −0.06 | −0.17** | 0.44** | | 0.63** | 0.35** | 0.76** | 0.37** | 0.35** | −0.34** | 0.30* | −0.23* |
| 9. (A)Break autonomy | | −0.27** | −0.01 | 0.01 | −0.14** | 0.34** | 0.54** | | 0.39** | 0.55** | 0.26* | 0.36** | −0.33** | 0.26* | −0.22* |
| 10. (M)Break mastery | | −0.19** | 0.04 | −0.02 | −0.09 | 0.18** | 0.32** | 0.21** | | 0.35** | 0.24 | 0.23 | −0.07 | 0.11 | 0.08 |
| 11. (M)Break meaning | | −0.20** | 0.01 | 0.01 | −0.14** | 0.18** | 0.36** | 0.27** | 0.26** | | 0.44** | 0.48** | −0.29* | 0.41** | −0.21 |
| 12. (A)Break affiliation | | −0.09 | −0.01 | −0.01 | −0.09 | 0.07 | 0.26** | 0.11* | 0.33** | 0.36** | | 0.32** | −0.39** | 0.35** | −0.38** |
| 13. Afternoon PA | | −0.23** | 0.17** | −0.15** | −0.32** | 0.18** | 0.17** | 0.10* | 0.12* | 0.18** | 0.19** | | −0.72** | 0.86** | −0.57** |
| 14. Afternoon NA | | 0.22** | −0.12* | 0.18** | 0.35** | −0.17** | −0.17** | −0.12* | −0.15* | −0.22** | −0.19** | −0.68** | | −0.66** | 0.93** |
| 15. Evening PA | | −0.04 | 0.05 | 0.01 | −0.10* | 0.11* | 0.05 | 0.04 | 0.05 | 0.15** | 0.09 | 0.25** | −0.20** | | −0.65** |
| 16. Evening NA | | 0.08 | 0.01 | 0.05 | 0.18** | −0.08 | −0.01 | −0.05 | −0.05 | −0.10* | −0.01 | −0.20** | 0.28** | −0.50** | |

*Note*: Within-level correlations are presented under the diagonal, and between-level correlations above the diagonal.

*$p < 0.05$, **$p < 0.01$.

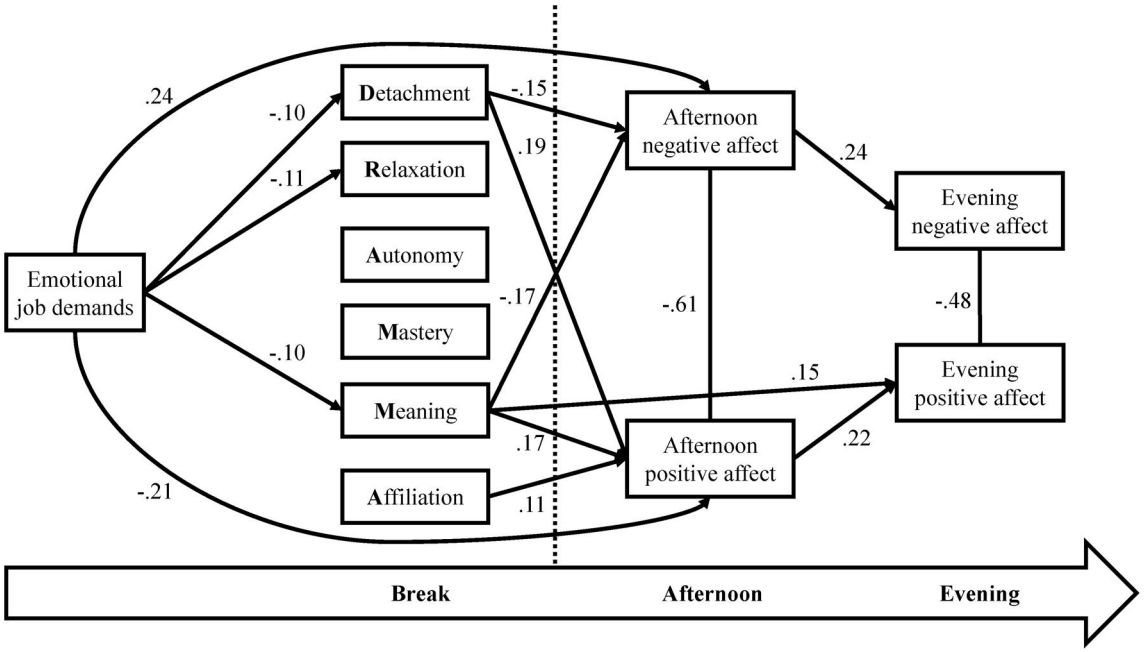


**FIGURE 1** Within-level results of the significant relationships between emotional demands, break DRAMMA experiences and afternoon and evening affect. Note: For clarity, pathways from the control variable workload to afternoon and evening affect are not depicted as well as the pathways from morning affect to afternoon affect. All pathways from workload to the affect outcomes were non-significant (afternoon positive affect: $\gamma = -0.05$, SE = 0.04, $p = 0.294$; afternoon negative affect: $\gamma = 0.03$, SE = 0.04, $p = 0.507$; evening positive affect: $\gamma = 0.04$, SE = 0.05, $p = 0.421$; evening negative affect: $\gamma = -0.01$, SE = 0.05, $p = 0.793$). The pathways from morning positive affect to afternoon positive affect ($\gamma = 0.13$, SE = 0.03, $p < 0.001$) and from morning negative affect to afternoon negative affect ($\gamma = 0.13$, SE = 0.03, $p < 0.001$) were statistically significant. In addition, correlations between break DRAMMA experiences and correlations between morning positive and morning negative affect are not visualized. All break DRAMMA experiences and morning affect measures were correlated

$p < 0.001$) and positively related to negative afternoon affect ($\gamma = 0.24$, SE = 0.04, $p < 0.001$), thereby supporting Hypothesis 2a.

Next, we examined whether break recovery experiences were related to increased afternoon positive affect and decreased afternoon negative affect. Our results showed that only break detachment ($\gamma = 0.19$, SE = 0.06, $p < 0.01$), meaning ($\gamma = 0.17$, SE = 0.06, $p < 0.01$), and affiliation ($\gamma = 0.11$, SE = 0.05, $p < 0.05$) were related to higher positive affect during the same afternoon. Break relaxation ($\gamma = -0.02$, SE = 0.07, $p = 0.633$), autonomy ($\gamma = -0.02$, SE = 0.06, $p = 0.723$), and mastery ($\gamma = 0.03$, SE = 0.05, $p = 0.512$) were not related to subsequent positive affect. Regarding negative afternoon affect, daily detachment ($\gamma = -0.15$, SE = 0.06, $p < 0.01$) and meaning ($\gamma = -0.17$, SE = 0.06, $p < 0.01$) predicted lower negative affect in the afternoon, whereas break relaxation ($\gamma = 0.03$, SE = 0.07, $p = 0.680$), autonomy ($\gamma = -0.01$, SE = 0.06, $p = 0.816$), mastery ($\gamma = -0.06$, SE = 0.05, $p = 0.279$), and affiliation ($\gamma = -0.10$, SE = 0.05, $p = 0.056$) did not. These results partly supported Hypothesis 3a.

Requirements for mediation include significant relations between independent variable and mediator, in addition to significant relations between mediator and dependent variables (cf. Hayes, 2009; 2013; see 'Statistical approach' in the Methods section for a description of mediation requirements and a description of how indirect effects were estimated). These requirements were fulfilled for the relationship between emotional job demands and afternoon positive and negative affect through detachment and meaning. Overview of these indirect effects is included in Table 4. Results show that detachment did indeed mediate the relationship between emotional job demands and positive afternoon affect (unstandardized estimate = −0.024, 95% CI [−0.055, −0.003], $p < 0.05$) and between emotional job demands and negative afternoon affect (unstandardized estimate = 0.018, 95% CI [0.001, 0.046], $p < 0.05$). On days when participants reported high emotional job demands, they were less able to detach from work during their breaks and subsequently reported less positive and more negative affect in the afternoon. Regarding emotional job demands, break meaning, and afternoon affect, the results supported break meaning as a mediator in the relationship between emotional job demands and positive affect in the afternoon (unstandardized estimate = −0.020, 95% CI [−0.051, −0.001], $p < 0.05$) as well as negative affect in the afternoon (unstandardized estimate = 0.019, 95% CI [0.001, 0.049], $p < 0.05$). On days when participants reported high emotional job demands, they experienced less meaning during their breaks and consequently experienced less positive affect and more negative affect in the afternoon. Hypothesis 4a gained partial support.

## 4.4 | Daily emotional job demands, break recovery experiences and evening affect

We expected daily emotional job demands to predict evening positive and negative affect. The results in Figure 1 and Table 3 show that

TABLE 3 Results of the multi-level path analysis: Direct effects between variables

| | Outcome | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Detachment | | Relaxation | | Autonomy | | Mastery | | Meaning | | Affiliation | | Afternoon PA | | Afternoon NA | | Evening PA | | Evening NA | |
| Predictor | γ | *p* | γ | *p* | γ | *p* | γ | *p* | γ | *p* | γ | *p* | γ | *p* | γ | *p* | γ | *p* | γ | *p* |
| Emotional demands | −0.10 | 0.018 | −0.11 | 0.012 | −0.08 | 0.060 | −0.06 | 0.018 | −0.10 | 0.023 | −0.07 | 0.103 | −0.20 | 0.000 | 0.24 | 0.000 | −0.02 | 0.638 | 0.08 | 0.068 |
| Detachment | | | | | | | | | | | | | 0.19 | 0.001 | −0.15 | 0.007 | 0.10 | 0.107 | −0.05 | 0.434 |
| Relaxation | | | | | | | | | | | | | −0.03 | 0.633 | 0.03 | 0.680 | −0.06 | 0.384 | 0.04 | 0.565 |
| Autonomy | | | | | | | | | | | | | −0.02 | 0.723 | −0.01 | 0.816 | −0.01 | 0.887 | −0.02 | 0.748 |
| Mastery | | | | | | | | | | | | | 0.03 | 0.512 | −0.06 | 0.279 | −0.02 | 0.792 | 0.04 | 0.500 |
| Meaning | | | | | | | | | | | | | 0.17 | 0.003 | −0.17 | 0.003 | 0.15 | 0.011 | −0.08 | 0.184 |
| Affiliation | | | | | | | | | | | | | 0.11 | 0.030 | −0.10 | 0.056 | 0.05 | 0.401 | 0.01 | 0.871 |
| Afternoon PA | | | | | | | | | | | | | | | | | 0.22 | 0.000 | | |
| Afternoon NA | | | | | | | | | | | | | | | | | | | 0.24 | 0.000 |

*Note*: Standard errors are not noted as they only varied between 0.03 and 0.07. γ = standardized estimate.

emotional job demands were not directly related to positive (γ = −0.02, SE = 0.05, *p* = 0.638) or negative affect (γ = 0.08, SE = 0.05, *p* = 0.068) in the evening. Accordingly, these results did not support Hypothesis 2b.

In the next step, we investigated whether break recovery experiences were directly related to increased positive affect in the evening and decreased negative affect in the evening. Our results revealed that break meaning was positively related to positive affect during the following evening (γ = 0.15, SE = 0.06, *p* < 0.05). Other break recovery experiences (detachment: γ = 0.10, SE = 0.06, *p* = 0.107; relaxation: γ = −0.06, SE = 0.07, *p* = 0.384; autonomy: γ = −0.01, SE = 0.06, *p* = 0.887; mastery: γ = −0.02, SE = 0.06, *p* = 0.792; affiliation: γ = 0.05, SE = 0.06, *p* = 0.401) were not related to positive affect in the evening. None of the daily break recovery experiences predicted negative evening affect: detachment: γ = −0.05, SE = 0.06, *p* = 0.434; relaxation: γ = 0.04, SE = 0.07, *p* = 0.565; autonomy: γ = −0.02, SE = 0.07, *p* = 0.748; mastery: γ = 0.04, SE = 0.06, *p* = 0.500; meaning: γ = −0.08, SE = 0.06, *p* = 0.184; affiliation: γ = 0.01, SE = 0.06, *p* = 0.871. These results only partially supported Hypothesis 3b.

The requirements for mediation were fulfilled for the relationship between emotional job demands and evening positive affect through break meaning. The multi-level mediation analyses revealed that break meaning did mediate the relationship between emotional job demands and evening positive affect (unstandardized estimate = −0.014, 95% CI [−0.039, −0.001], *p* < 0.05). On days when participants reported higher emotional job demands, they felt less meaning during their breaks, which in turn was related to less positive affect in the evening. Hypothesis 4b gained partial support.

## 4.5 | Exploratory analyses

Although not explicitly hypothesized, we assumed afternoon affect to predict evening affect. Our results confirmed this assumption and showed that afternoon positive affect was related to evening positive affect (γ = 0.22, SE = 0.05, *p* < 0.001) and that afternoon negative affect was associated with evening negative affect (γ = 0.24, SE = 0.05, *p* < 0.001). We found identical results for the between-level (afternoon positive affect → evening positive affect: γ = 0.83, SE = 0.06, *p* < 0.001; afternoon negative affect → evening negative affect: γ = 0.93, SE = 0.03, *p* < 0.001).

As some daily break recovery experiences (i.e., break detachment, meaning, and affiliation) were related to subsequent afternoon affect and afternoon affect was related to evening affect, we performed five exploratory multi-level mediation analyses. The results showed that afternoon positive affect did mediate the relationship between break detachment (unstandardized estimate = 0.035, 95% CI [0.013, 0.067], *p* < 0.001) and meaning (unstandardized estimate = 0.023, 95% CI [0.007, 0.045], *p* < 0.01) on the one hand and positive evening affect on the other. The same was true for break affiliation (unstandardized estimate = 0.018, 95% CI [0.002, 0.039], *p* < 0.05). On days when participants reported better detachment,

**TABLE 4** Overview of indirect effects, for which requirements for mediation were fulfilled

| Direction of effect | Unstandardized estimate | 95% CI | *p* |
|---|---|---|---|
| Emotional demands → detachment → afternoon PA | −0.024 | −0.055–−0.003 | 0.011 |
| Emotional demands → meaning → afternoon PA | −0.020 | −0.051–−0.001 | 0.015 |
| Emotional demands → detachment → afternoon NA | 0.018 | 0.001–0.046 | 0.016 |
| Emotional demands → meaning → afternoon NA | 0.019 | 0.001–0.049 | 0.016 |
| Emotional demands → meaning → evening PA | −0.014 | −0.039–0.001 | 0.020 |
| Exploratory results | | | |
| Detachment → afternoon PA→ evening PA | 0.035 | 0.013–0.067 | 0.000 |
| Meaning → afternoon PA→ evening PA | 0.023 | 0.007–0.045 | 0.002 |
| Affiliation → afternoon PA→ evening PA | 0.018 | 0.002–0.039 | 0.015 |
| Detachment → afternoon NA→ evening NA | −0.026 | −0.053–−0.006 | 0.005 |
| Meaning → afternoon NA→ evening NA | −0.021 | −0.041–−0.006 | 0.002 |
| Reversed mediation results | | | |
| Detachment → emotional demands→ afternoon PA | 0.063 | 0.023–0.112 | 0.001 |
| Autonomy → emotional demands→ afternoon PA | 0.032 | 0.005–0.064 | 0.010 |
| Affiliation → emotional demands→ afternoon PA | 0.043 | 0.014–0.078 | 0.002 |
| Detachment → emotional demands→ afternoon NA | −0.079 | −0.135–−0.029 | 0.001 |
| Autonomy → emotional demands→ afternoon NA | −0.040 | −0.078–−0.006 | 0.010 |
| Affiliation → emotional demands→ afternoon NA | −0.054 | −0.095–−0.018 | 0.002 |
| Detachment → emotional demands→ evening NA | −0.025 | −0.052–−0.007 | 0.001 |
| Autonomy → emotional demands→ evening NA | −0.013 | −0.029–−0.002 | 0.010 |
| Affiliation → emotional demands→ evening NA | −0.054 | −0.036–−0.004 | 0.002 |

more meaning and affiliation during their breaks, they reported more positive affect the following afternoon, which in turn was favourable for positive evening affect. In addition, afternoon negative affect acted as a mediator between break detachment (unstandardized estimate = −0.026, 95% CI [-0.053, −0.006], $p < 0.01$) and meaning (unstandardized estimate = −0.021, 95% CI [−0.041, −0.006], $p < 0.01$) and negative affect the following evening. On days when participants reported better detachment and more meaning during their breaks, they reported less negative affect the following afternoon and in turn less negative evening affect.

In addition, we performed several robustness analyses to check whether background variables such as gender, age, years of work experience, work hours per week, experiencing a negative or positive event during the workday, and number of breaks change the results. Adding these as control variables did not change the results of the analyses.

### 4.6 | Reversed pathways from daily break experiences to emotional demands and affect

Given our chosen design and the fact that we measured emotional demands and break recovery experiences at the same time, it could also be that break recovery experiences predict emotional demands that day and not the other way around. To explore this further, we performed another multi-level path analysis and multi-level mediation analyses, in which we estimated reversed pathways from the six break recovery experiences to emotional demands and to all affect outcomes. The fit of this reversed model was worse than the fit of our initial model ($\chi^2$ (57) = 129.673, CFI = 0.963, RMSEA = 0.049, $SRMR_{within} = 0.088$, $SRMR_{between} = 0.062$).[1] The reversed model with the multi-level mediation analyses indicated that on days when participants reported better detachment, more autonomy, and more affiliation during their breaks, they reported fewer emotional demands and, in turn, less negative affect and more positive affect in the afternoon, and less negative affect the following evening. These results indicate that emotional demands could also be an underlying mechanism linking break detachment, autonomy, and affiliation to afternoon positive and negative affect, as well as evening negative affect. The detailed results are not shown but upon request they are available from the first author.

## 5 | DISCUSSION

The main aim of this diary study was to investigate whether the six recovery experiences based on the DRAMMA model (Newman et al., 2014) during workday breaks acted as underlying mechanisms

in the relationship between daily emotional job demands and affective well-being both in the afternoon and in the evening.

## 5.1 | Main results

Our findings extend existing research by showing that, of the break recovery experiences, detachment and meaning functioned as underlying mechanisms between daily emotional job demands and affective outcomes. Thus, on the days when teachers reported high emotional demands, they experienced less detachment during their breaks and consequently experienced less positive affect and more negative affect in the afternoon. On the days when teachers experienced less break meaning due to high emotional job demands, they also experienced more negative affect in the afternoon and less positive affect in the evening. Emotional demands were also directly related to higher negative affect and to lower positive affect in the afternoon (meaning that the mediation effects were partial). However, they were not directly related to evening affects. Consequently, of the six recovery experiences, only detachment and meaning turned out to be significant underlying mechanisms in the daily emotional job demands–affect relationship.

The result concerning the important role of *detachment* is not surprising (Sonnentag, 2018). Interestingly, however, in our study detachment was the least often reported break recovery experience. This is likely related to the fact that most (68%) of our participants spent their longest lunchtime break with pupils, which means that among teachers not all breaks fulfil the criterion of break, that is, a break from job demands. Still, our findings imply that even a small amount of detachment during breaks may suffice to achieve well-being benefits. It was probably also difficult to detach from emotional job demands during breaks due to negative activation related to these demands, which was reflected in increased negative affect and decreased positive affect in the afternoon. Detachment during off-job time has been reported in several studies to function as a mediator (Bennett et al., 2018; Schraub et al., 2013). Our study showed that poor detachment during breaks also impedes internal recovery and is related to less positive affect and more negative affect during the afternoon, thereby corroborating earlier studies on within-workday recovery (Rhee & Kim, 2016; Sianoja et al., 2018; Von Dreden & Binnewies, 2017). In addition, via afternoon affect break detachment did have effects on both positive and negative evening affect, also suggesting longer-lasting indirect effects.

*Meaning* has not received much attention as a recovery experience so far, although experiencing meaning in one's activities is related to better well-being (Newman et al., 2014). Our study suggests that doing something meaningful during breaks when experiencing high emotional demands at work is crucial as its positive well-being effects lasted even until the evening. In fact, meaning was the only break recovery experience having such direct lasting effects, thereby also lending support to our anticipation that the positive effects of break recovery experiences are mostly seen in the afternoon. Nevertheless, break meaningfulness also had an indirect effect on evening positive affect via afternoon positive affect. Spending one's breaks during the working day in a meaningful way may be a small step to increase the presence of meaning in one's life and to cope with work-related stressors.

In addition to detachment and meaning, *affiliation* was related to (positive) afternoon affect despite the fact that affiliation was not associated with emotional demands. Furthermore, break affiliation had an indirect effect on evening positive affect via positive afternoon affect. Affiliation was the most frequently reported recovery experience. At least in a good workplace atmosphere affiliation can be achieved during breaks because most teachers have opportunities to spend their breaks with colleagues. Earlier diary studies have also found that experiencing relatedness during breaks as well as social break activities are beneficial for recovery (Bosch et al., 2018; Kim et al., 2017; Von Dreden & Binnewies, 2017).

Daily high emotional demands also challenged break *relaxation*, although their links to afternoon or evening affect were non-significant, contrary to several diary studies suggesting that break relaxation (Bosch et al., 2018; Kim et al., 2017) is important for internal recovery. One explanation for the absent links might lie in high mutual correlations between detachment, relaxation and autonomy. When taking all these factors simultaneously into account, the direct links from relaxation and autonomy to affect (seen at a correlational level) disappeared. In addition, our sample consisted of school-teachers only in contrast to earlier studies including participants from different occupational groups. Also, we investigated all breaks during the working day, whereas diary studies have previously focused exclusively on lunch breaks (Bosch et al., 2018; Sianoja et al., 2018) or micro-breaks (Kim et al., 2017).

*Mastery* turned out be the only break recovery experience which was related to neither emotional demands nor to afternoon or evening affect. Our study therefore suggests that break mastery does not function as a recovery experience promoting recovery. This may relate to the fact that it is difficult to have mastery experiences (the second least frequently reported recovery experience in our sample) during short breaks. Activities producing mastery experiences are also energy consuming, that is, internal resources are needed and depleted for new challenges and learning during breaks.

## 5.2 | Theoretical contributions

Our study makes three contributions to the literature. *First*, this is the first study so far to investigate all six recovery experiences presented in the DRAMMA model (Newman et al., 2014) in the context of within-workday breaks. Our results lend support to the DRAMMA model: in addition to detachment, meaning and affiliation during breaks also seem to be beneficial for affective well-being. This extends the findings from earlier break recovery studies, which have mostly focused on the four recovery experiences proposed by Sonnentag and Fritz (2007). Although meaning and affiliation have received little attention as recovery experiences, several theoretical perspectives highlight their importance for people's well-being (for

an overview, see Newman et al., 2014). *Second*, break detachment and meaning functioned as underlying mechanisms in the daily relationship between emotional demands and affect. Thus, our study revealed new paths through which emotional demands are detrimental to well-being at the day-level. Although research has shown that detachment during off-job time may function as such a mediating mechanism (Bennett et al., 2018; Kinnunen et al., 2011) our study is the first to show that break detachment also plays a mediating role. *Third*, our findings also offer new insights concerning the relationship between within-workday recovery and well-being *after* the working day. The positive effects of break meaning were still visible before going to sleep in the evening, suggesting that the impact of successful break recovery lasts more than just a few hours during the working day. In addition, break detachment, meaning, and affiliation had effects on evening affect via afternoon affect.

All in all, our findings suggest that breaks which are important and personally meaningful for employees support their recovery. This is in line with the idea of a person-break fit, which is the balance between a person's break-related needs and their actual breaks (Venz et al., 2019), and the findings regarding the well-being benefits of experiencing meaning in life (e.g., Machell et al., 2015; Thrash et al., 2010). Also, to the best of our knowledge, no studies to date have focused on breaks during the working day in the context of the teaching profession, although schoolteachers often have high job demands and stress levels (e.g., Arvidsson et al., 2016; Kyriacou, 2001; Skaalvik & Skaalvik, 2015; 2017). Compared to many other knowledge workers, teachers have limited autonomy concerning break timing and break activities. These specific demands of a teaching job are major challenges for break recovery, and therefore it is important to study this issue specifically in a teaching context.

## 5.3 | Practical implications

Our findings highlight the benefits of detachment, meaning and affiliation during breaks in terms of affective well-being. Accordingly, we encourage schoolteachers to pursue break activities that could help them to have these experiences. Avoiding performing work tasks during breaks whenever possible is essential for break recovery: Recovery is not possible in the presence of immediate job demands. In addition, positive social interactions with colleagues are likely to produce experiences of affiliation. Therefore, it would likely be useful for teachers to spend their breaks with colleagues as often as possible. This might also afford them social support, which helps them to deal with problems they encounter at work and can also be related to higher work engagement, job satisfaction and better mental health (Simbula, 2010). Social support could be particularly useful in dealing with emotional stressors, which are highly prevalent in teachers' work both according to earlier studies (e.g., Bauer, 2007; Skaalvik & Skaalvik, 2017; Unterbrink et al., 2008) and also in our sample. However, if the atmosphere at work is not good, spending time with colleagues is unlikely to promote recovery.

According to our findings, when teachers can spend their breaks doing something which is personally important and meaningful for them, they recover more successfully. What these meaningful activities are likely varies between individuals. They may, for example, include engaging in relaxing, physical, or social activities during breaks. Research has shown that enjoyment of breaks (Hunter & Wu, 2016; Sianoja et al., 2018) and a good person-break fit (Venz et al., 2019) are linked to better recovery during breaks. This means that employees can enhance their break recovery by taking time for something they like and feel meaningful. This requires sufficient levels of autonomy and is not always possible in busy and restricted working environments like schools.

Although individual employees can proactively make changes that support their break recovery, employers should also pay more attention to ensuring working conditions which enable within-workday recovery. For example, recruiting assistants to oversee pupils during lunch breaks and breaks between classes would allow teachers more opportunities to spend their breaks in a preferred way. Naturally, this is an economic issue which, however, could pay off financially if teachers were able to recover better, need fewer sick leaves and be able to work effectively. It is also good to remember that teachers' well-being is of interest not only for their own sake but also for their pupils' sake: teacher stress relates to pupils' stress (e.g., Oberle & Schonert-Reichl, 2016) and may impair academic outcomes and lower motivation (e.g., Zhang & Sapp, 2008).

The findings of this study, combined with those from other intervention studies, could also be applied in designing interventions to promote break recovery such as nature walks and relaxation exercises (e.g., Sianoja et al., 2018; Steidle et al., 2017). Additionally, interventions outside working hours suggest that recovery training can help increase recovery experiences (for a review, see Verbeek et al., 2018). Future interventions could focus more specifically on strategies targeted at increasing detachment, meaning and affiliation during breaks in the working day. In addition, in designing interventions it is important to take account of the demands of a specific occupation. For example, taking a walk during a lunch break may not be possible for teachers due to time or location constraints.

## 5.4 | Limitations and suggestions for future research

There are a few limitations to be considered. *First*, the timing of the measurements: Break recovery experiences were assessed at the same time as afternoon affect. Although we asked participants to rate their recovery experiences during all breaks during that day and affect at the exact time when filling in the questionnaire, it is possible that current mood also played a role in the retrospective ratings of break experiences. Daily emotional job demands were also measured in the afternoon questionnaire. Therefore, it is possible that teachers who did not manage to recover well during breaks perceived their emotional demands during the day to be particularly high. We investigated this issue further by conducting a reverse mediation

analysis with emotional demands as a mediator between break recovery experiences and affective outcomes. Even though the model fit was worse than the fit of our original model, it is noteworthy that break detachment, autonomy, and affiliation also seem to predict emotional demands and via these demands predict subsequent afternoon and evening affect. Future diary studies could consider including measurements in the middle of the working day as well, although this may not be convenient for participants—burdening them with very frequent measurements might even increase their stress. For example, measurements after each break might be difficult to implement among teachers, who already have a tight and structured schedule.

*Second*, we were interested in within-workday breaks in general and did not differentiate between different types of breaks. Therefore, we were not able to compare lunch breaks and shorter breaks between classes. Future studies could pay more attention to comparing different break types (including very short micro-breaks) and recovery experiences and activities during those different types of breaks. Also, assessing 'averaged' breaks (i.e., participants were asked to evaluate all their breaks during the workday at the same time) means that breaks which were longer or later in the day may have weighted more in participants' evaluations. Findings from earlier studies show that break timing may matter for well-being outcomes: for example, Kühnel et al. (2017) found that taking a short break in the afternoon was related to better daily work engagement measured at the end of the working day, whereas a break in the morning was not. On the other hand, they also found that it is better to take short breaks *both* in the morning and in the afternoon than to take a break either in the morning or in the afternoon. In future studies, event-based designs might be useful to further investigate the effects of break timing and duration. Concerning the number of breaks, when we conducted the analyses using the number of breaks as a control variable, we found that it did not play a role in predicting the outcomes.

*Third*, the use of paper-and-pencil questionnaires also has its limitations. Despite instructions and text message reminders, it was impossible to fully control the time the participants filled in the questionnaires. For this reason, we always asked them to report the time of answering in the booklet. Adherence to the protocol was generally good in terms of reported response times. Future studies could avoid these problems, for example by using short questionnaires provided in a smartphone application or via text messages. *Fourth*, we used one-item measures for some break recovery experiences. Although one-item measures have been demonstrated to be often valid (Fisher et al., 2016) and reduce the burden on participants in diary studies including several measurements per day, future studies may benefit from multiple item measures. *Fifth*, although we tested mediation in a longitudinal study, we cannot draw definite conclusions in causality, because our study did not include manipulation of variables (such as an intervention study). *Sixth*, the reliability of our positive affect measure was quite low. This may be due to the combination of positive affect characterized by both high and low activity level. *Finally*, our sample was quite old (mean age around 50 years), which may have affected the results. It is possible that older teachers have better recovery self-efficacy, that is, they have learnt which strategies are the most effective for them in promoting recovery. Ageing is related to effectiveness in implementing emotion regulation strategies (e.g., Scheibe & Zacher, 2013), which are closely related to recovery processes (Sonnentag & Fritz, 2007).

The findings of this study suggest five directions for future research. *First*, our theoretical framework, the DRAMMA model (Newman et al., 2014) needs to be studied further in the context of breaks. Future studies could, for example, focus more on examining which break characteristics (i.e., spending the break at the workplace or outside, timing and duration of the break) or activities predict recovery experiences during breaks. This would likely generate ideas for designing effective interventions to promote break recovery among different occupational groups. *Second*, combining self-report measurements of recovery experiences with physiological measurements would offer an interesting perspective on break recovery. Some intervention studies aiming to support break recovery have utilized physiological measurements such as heartrate, heartrate variability (Brown et al., 2012), or cortisol levels (Krajewski et al., 2011), but these studies did not investigate psychological recovery experiences. *Third*, along with well-being outcomes, future studies could also investigate how break recovery is related to performance-related outcomes, such as concentration capacity and creativity at work. For example, it is possible that very high detachment—especially during breaks—may be detrimental to performance. After successfully detaching from work, reattachment (i.e., rebuilding a mental connection to work) is needed when continuing to work and may take some effort (Sonnentag et al., 2019; Sonnentag & Kühnel, 2016). So far, reattachment has been studied in the context of starting the working day, but the same idea could also be applied to within-workday breaks such as lunch breaks. *Fourth*, future studies could investigate how employees can proactively support their recovery during the working day with the help of crafting behaviours (see e.g., Petrou & Bakker, 2016; Petrou et al., 2017). *Fifth*, future studies could pay attention to which events and experiences after the working day (such as negative events or high demands at home) possibly moderate the relationship between internal recovery and well-being outcomes later in the day. *Sixth*, comparing the effects on recovery experiences and well-being outcomes of emotional demands with other demands, such as workload, would yield more information about their mutual effects. Concerning the association between break recovery and well-being after the working day, it would be worth examining whether break recovery experiences are associated with recovery experiences and activities in the evening.

## 6 | CONCLUSIONS

Our findings offer new insights into the interplay of daily job demands, recovery during breaks and affective well-being. The results

of this diary study suggest that experiences of detachment, meaning and affiliation during within-workday breaks promote teachers' well-being. This lends further support to the DRAMMA model, suggesting that meaning and affiliation are also important recovery experiences. Break detachment and meaning acted as mediators between daily emotional job demands and affective well-being. Possible practical implications include break recovery training and interventions targeting teachers. Also, employers should pay attention to teachers' working conditions in order to support their opportunities to recover from work during breaks.

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## CONFLICTS OF INTERESTS

The authors report no conflicts of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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## REFERENCES

Aguinis, H., Gottfredson, R. K., & Culpepper, S. A. (2013). Best-practice recommendations for estimating cross-level interaction effects using multilevel modeling. *Journal of Management*, *39*, 1490–1528. https://doi.org/10.1177/0149206313478188

Arvidsson, I., Håkansson, C., Karlson, B., Björk, J., & Persson, R. (2016). Burnout among Swedish school teachers - a cross-sectional analysis. *BMC Public Health*, *16*, 1–11. https://doi.org/10.1186/s12889-016-3498-7

Bandura, A (1997). *Self-efficacy: The exercise of control*. W.H. Freeman.

Bakker, A. B., & Demerouti, E. (2017). Job demands-resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, *22*, 273–285. https://doi.org/10.1037/ocp0000056

Bakker, A. B., Sanz-Vergel, A. I., Rodríguez-Muñoz, A., & Oerlemans, W. G. M. (2015). The state version of the recovery experience questionnaire: A multilevel confirmatory factor analysis. *European Journal of Work & Organizational Psychology*, *24*, 350–359. https://doi.org/10.1080/1359432X.2014.903242

Bauer, J., Unterbrink, T., Hack, A., Pfeifer, R., Buhl-Grießhaber, V., Müller, U., Wesche, H., Frommhold, M., Seibt, R., Scheuch, K., & Wirsching, M. (2007). Working conditions, adverse events and mental health problems in a sample of 949 German teachers. *International Archives of Occupational and Environmental Health*, *80*, 442–449. https://doi.org/10.1007/s00420-007-0170-7

Bennett, A. A., Bakker, A. B., & Field, J. G. (2018). Recovery from work-related effort: A meta-analysis. *Journal of Organizational Behavior*, *39*, 262–275. https://doi.org/10.1002/job.2217

Biron, M., & Van Veldhoven, M. (2012). Emotional labour in service work: Psychological flexibility and emotion regulation. *Human Relations*, *65*, 1259–1282. https://doi.org/10.1177/0018726712447832

de Bloom, J., Kinnunen, U., & Korpela, K. (2015). Recovery processes during and after work. *Journal of Occupational and Environmental Medicine*, *57*, 732–742. https://doi.org/10.1097/JOM.0000000000000475

de Bloom, J., Sianoja, M., Korpela, K., Tuomisto, M., Lilja, A., Geurts, S., & Kinnunen, U. (2017). Effects of park walks and relaxation exercises during lunch breaks on recovery from job stress: Two randomized controlled trials. *Journal of Environmental Psychology*, *51*, 14–30. https://doi.org/10.1016/j.jenvp.2017.03.006

Bosch, C., Sonnentag, S., & Pinck, A. S. (2018). What makes for a good break? A diary study on recovery experiences during lunch break. *Journal of Occupational and Organizational Psychology*, *91*, 134–157. https://doi.org/10.1111/joop.12195

Broeck, A., Vansteenkiste, M., Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-related Basic Need Satisfaction scale. *Journal of Occupational and Organizational Psychology*, *83*, 981–1002. https://doi.org/10.1348/096317909X481382

Brosschot, J. F., Gerin, W., & Thayer, J. F. (2006). The perseverative cognition hypothesis: A review of worry, prolonged stress-related physiological activation, and health. *Journal of Psychosomatic Research*, *60*, 113–124. https://doi.org/10.1016/j.jpsychores.2005.06.074

Brown, D. K., Barton, J. L., Pretty, J., & Gladwell, V. F. (2012). Walks4work: Rationale and study design to investigate walking at lunchtime in the workplace setting. *BMC Public Health*, *12*(1), 1–10.

Butler, J., & Kern, M. L. (2016). The PERMA-profiler: A brief multidimensional measure of flourishing. *International Journal of Wellbeing*, *6*, 1–48. https://doi.org/10.5502/ijw.v6i3.526

Chawla, N., MacGowan, R. L., Gabriel, A. S., & Podsakoff, N. P. (2020). Unplugging or staying connected? Examining the nature, antecedents, and consequences of profiles of daily recovery experiences. *Journal of Applied Psychology*, *105*(1), 19–39. https://doi.org/10.1037/apl0000423

Chen, Y., & Li, S. (2019). The relationship between workplace ostracism and sleep quality: A mediated moderation model. *Frontiers in Psychology*, *10*, 319. https://doi.org/10.3389/fpsyg.2019.00319

Chen, Y., Li, S., Xia, Q., & He, C. (2017). The relationship between job demands and employees' counterproductive work behaviors: The mediating effect of psychological detachment and job anxiety. *Frontiers in Psychology*, *8*, 1890. https://doi.org/10.3389/fpsyg.2017.01890

Coffeng, J. K., van Sluijs, E. M., Hendriksen, I. J. M., van Mechelen, W., & Boot, C. R. L. (2015). Physical activity and relaxation during and after work are independently associated with the need for recovery. *Journal of Physical Activity and Health*, *12*, 109–115. https://doi.org/10.1123/jpah.2012-0452

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience* (Vol. 1990). Harper & Row.

Demerouti, E., Bakker, A., Geurts, S., & Taris, T. (2009). Daily recovery from work-related effort during non-work time. In S. Sonnentag, P. Perrewé, & D. Ganster (Eds.), *Current perspectives on job-stress recovery* (pp. 85–123). Emerald Group Publishing Limited. https://doi.org/10.1108/S1479-3555(2009)0000007006

Esch, T., & Stefano, G. B. (2004). The neurobiology of pleasure, reward processes, addiction and their health implications. *Neuroendocrinology Letters*, *25*(4), 235–251.

Extremera, N., & Rey, L. (2016). Ability emotional intelligence and life satisfaction: Positive and negative affect as mediators. *Personality and Individual Differences*, *102*, 98–101. https://doi.org/10.1016/j.paid.2016.06.051

Fisher, G. G., Matthews, R. A., & Gibbons, A. M. (2016). Developing and investigating the use of single-item measures in organizational research. *Journal of Occupational Health Psychology*, *21*, 3–23. https://doi.org/10.1037/a0039139

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, *56*(3), 218–226. https://doi.org/10.1037/0003-066X.56.3.218

Germeys, L., & De Gieter, S. (2016). Can recovery buffer for negative effects of daily workload on marital satisfaction among spouses? In *Academy of Management Annual Meeting Proceedings* (Vol. *2016*, No. 1, pp. 16346–16346).

Geurts, S. A., & Sonnentag, S. (2006). Recovery as an explanatory mechanism in the relation between acute stress reactions and chronic health impairment. *Scandinavian Journal of Work, Environment & Health*, *32*, 482–492.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, *76*, 408–420. https://doi.org/10.1080/03637750903310360

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*, 513–524.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*, 1–55. https://doi.org/10.1080/10705519909540118

Hülsheger, U. R., & Schewe, A. F. (2011). On the costs and benefits of emotional labor: A meta-analysis of three decades of research. *Journal of Occupational Health Psychology*, *16*, 361–389. https://doi.org/10.1037/a0022876

Hunter, E. M., & Wu, C. (2016). Give me a better break: Choosing workday break activities to maximize resource recovery. *Journal of Applied Psychology*, *101*, 302–311. https://doi.org/10.1037/apl0000045

Ilies, R., Dimotakis, N., & De Pater, I. E. (2010). Psychological and physiological reactions to high workloads: Implications for well-being. *Personnel Psychology*, *63*(2), 407–436. https://doi.org/10.1111/j.1744-6570.2010.01175.x

Ilies, R., Schwind, K. M., Wagner, D. T., Johnson, M. D., DeRue, D. S., & Ilgen, D. R. (2007). When can employees have a family life? The effects of daily workload and affect on work-family conflict and social behaviors at home. *Journal of Applied Psychology*, *92*(5), 1368–1379. https://doi.org/10.1037/0021-9010.92.5.1368

Iwasaki, Y. (2008). Pathways to meaning-making through leisure-like pursuits in global contexts. *Journal of Leisure Research*, *40*, 231–249. https://doi.org/10.1080/00222216.2008.11950139

Iwasaki, Y., Messina, E. S., & Hopper, T. (2018). The role of leisure in meaning-making and engagement with life. *The Journal of Positive Psychology*, *13*(1), 29–35.

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

Kim, S., Park, Y., & Niu, Q. (2017). Micro-break activities at work to recover from daily work demands. *Journal of Organizational Behavior*, *38*, 28–44. https://doi.org/10.1002/job.2109

Kinnunen, U., Feldt, T., Siltaloppi, M., & Sonnentag, S. (2011). Job demands-resources model in the context of recovery: Testing recovery experiences as mediators. *European Journal of Work & Organizational Psychology*, *20*, 805–832. https://doi.org/10.1080/1359432X.2010.524411

Kinnunen, U., de Bloom, J., & Virtanen, A. (2019). Do older teachers benefit more from workday break recovery than younger ones? *Scandinavian Journal of Work and Organizational Psychology*, *4*(1), 7. 1–15.

Kinman, G., Wray, S., & Strange, C. (2011). Emotional labour, burnout and job satisfaction in UK teachers: The role of workplace social support. *Educational Psychology*, *31*(7), 843–856.

Krajewski, J., Sauerland, M., & Wieland, R. (2011). Relaxation-induced cortisol changes within lunch breaks - an experimental longitudinal worksite field study. *Journal of Occupational and Organizational Psychology*, *84*, 382–394. https://doi.org/10.1348/096317910X485458

Krajewski, J., Wieland, R., & Sauerland, M. (2010). Regulating strain states by using the recovery potential of lunch breaks. *Journal of Occupational Health Psychology*, *15*, 131–139. https://doi.org/10.1037/a0018830

Kühnel, J., Zacher, H., de Bloom, J., & Bledow, R. (2017). Take a break! Benefits of sleep and short breaks for daily work engagement. *European Journal of Work & Organizational Psychology*, *26*, 481–491. https://doi.org/10.1080/1359432X.2016.1269750

Kuppens, P., Realo, A., & Diener, E. (2008). The role of positive and negative emotions in life satisfaction judgment across nations. *Journal of Personality and Social Psychology*, *95*(1), 66–75. https://doi.org/10.1037/0022-3514.95.1.66

Kyriacou, C. (2001). Teacher stress: Directions for future research. *Educational Review*, *53*, 27–35. https://doi.org/10.1080/00131910120033628

Lakey, B., & Orehek, E. (2011). Relational regulation theory: A new approach to explain the link between perceived social support and mental health. *Psychological Review*, *118*, 482–495. https://doi.org/10.1037/a0023477

Loveday, P. M., Lovell, G. P., & Jones, C. M. (2018). The importance of leisure and the psychological mechanisms involved in living a good life: A content analysis of best-possible-selves texts. *The Journal of Positive Psychology*, *13*(1), 18–28.

Machell, K. A., Kashdan, T. B., Short, J. L., & Nezlek, J. B. (2015). Relationships between meaning in life, social and achievement events, and positive and negative affect in daily life. *Journal of Personality*, *83*, 287–298. https://doi.org/10.1111/jopy.12103

McEwen, B. S. (1998). Stress, adaptation, and disease: Allostasis and allostatic load. *Annals of the New York Academy of Sciences*, *840*, 33–44. https://doi.org/10.1111/j.1749-6632.1998.tb09546.x

Meijman, T. F., & Mulder, G. (1998). Psychological aspects of workload. In P. J. D. Drenth, H. Thierry, & C. J. de Wolff (Eds.), *Handbook of work and organizational psychology* (2nd ed. (pp. 5–33). Psychology Press.

Moè, A., Pazzaglia, F., & Ronconi, L. (2010). When being able is not enough. The combined value of positive affect and self-efficacy for job satisfaction in teaching. *Teaching and Teacher Education*, *26*(5), 1145–1153. https://doi.org/10.1016/j.tate.2010.02.010

Mojza, E. J., Sonnentag, S., & Bornemann, C. (2011). Volunteer work as a valuable leisure-time activity: A day-level study on volunteer work, non-work experiences, and well-being at work. *Journal of Occupational and Organizational Psychology*, *84*(1), 123–152. https://doi.org/10.1348/096317910X485737

Muthén, L. K., & Muthén, B. O. (2015). *Mplus user's guide (1998–2015)*. Muthén & Muthén.

Newman, D. B., Tay, L., & Diener, E. (2014). Leisure and subjective well-being: A model of psychological mechanisms as mediating factors. *Journal of Happiness Studies*, *15*, 555–578. https://doi.org/10.1007/s10902-013-9435-x

Newman, D. B., Nezlek, J. B., & Thrash, T. M. (2018). The dynamics of searching for meaning and presence of meaning in daily life. *Journal of Personality*, *86*(3), 368–379.

Oberle, E., & Schonert-Reichl, K. A. (2016). Stress contagion in the classroom? The link between classroom teacher burnout and morning cortisol in elementary school students. *Social Science & Medicine*, *159*, 30–37. https://doi.org/10.1016/j.socscimed.2016.04.031

Ohly, S., Sonnentag, S., Niessen, C., & Zapf, D. (2010). Diary studies in organizational research. *Journal of Personnel Psychology*, *9*, 79–93. https://doi.org/10.1027/1866-5888/a000009

Pejtersen, J. H., Kristensen, T. S., Borg, V., & Bjorner, J. B. (2010). The second version of the copenhagen psychosocial questionnaire. *Scandinavian Journal of Public Health*, *38*, 8–24. https://doi.org/10.1177/1403494809349858

Petrou, P., & Bakker, A. B. (2016). Crafting one's leisure time in response to high job strain. *Human Relations*, *69*, 507–529. https://doi.org/10.1177/0018726715590453

Petrou, P., Bakker, A. B., & van den Heuvel, M. (2017). Weekly job crafting and leisure crafting: Implications for meaning-making and work engagement. *Journal of Occupational and Organizational Psychology*, *90*, 129–152. https://doi.org/10.1111/joop.12160

Philipp, A., & Schüpbach, H.. (2010). Longitudinal effects of emotional labour on emotional exhaustion and dedication of teachers. *Journal of Occupational Health Psychology*, *15*(4), 494.

Pindek, S., Arvan, M. L., & Spector, P. E. (2019). The stressor-strain relationship in diary studies: A meta-analysis of the within and between levels. *Work & Stress*, *33*(1), 1–21. https://doi.org/10.1080/02678373.2018.1445672

Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, *26*(4), 419–435. https://doi.org/10.1177/0146167200266002

Rhee, H., & Kim, S. (2016). Effects of breaks on regaining vitality at work: An empirical comparison of 'conventional' and 'smart phone' breaks. *Computers in Human Behavior*, *57*, 160–167. https://doi.org/10.1016/j.chb.2015.11.056

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*, 68–78.

Ryan, R. M., & Deci, E. L. (2008). From ego depletion to vitality: Theory and findings concerning the facilitation of energy available to the self. *Social and Personality Psychology Compass*, *2*(2), 702–717.

Scheel, T. E., Putz, D., & Kurzawa, C. (2017). Give me a break: Laughing with colleagues guards against ego depletion. *European Journal of Humour Research*, *5*, 36–51. https://doi.org/10.7592/EJHR2017.5.1.scheel

Scheibe, S., Stamov-Rossnagel, C., & Zacher, H. (2015). Links between emotional job demands and occupational well-being: Age differences depend on type of demand. *Work, Aging and Retirement*, *1*, 254–265. https://doi.org/10.1093/workar/wav007

Scheibe, S., & Zacher, H. (2013). A lifespan perspective on emotion regulation, stress, and well-being in the workplace. In C. C. Rosen, J. R. B. Halbesleben, & P. L. Perrew (Eds.), *The role of emotion and emotion regulation in job stress and well-being* (pp. 163–193). Emerald Group Publishing Limited. https://doi.org/10.1108/S1479-3555(2013)0000011010

Schraub, E. M., Turgut, S., Clavairoly, V., & Sonntag, K. (2013). Emotion regulation as a determinant of recovery experiences and well-being: A day-level study. *International Journal of Stress Management*, *20*, 309–335. https://doi.org/10.1037/a0034483

Schulenberg, S. E., Schnetzer, L. W., & Buchanan, E. M. (2011). The purpose in life test-short form: Development and psychometric support. *Journal of Happiness Studies*, *12*, 861–876. https://doi.org/10.1007/s10902-010-9231-9

Sheldon, K. M., Ryan, R., & Reis, H. T. (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin*, *22*(12), 1270–1279. https://doi.org/10.1177/01461672962212007

Sianoja, M., Kinnunen, U., De Bloom, J., & Korpela, K. (2015). Insufficient recovery from job stress as a risk factor for poor health and well-being. In C. R. Hopkins (Ed.), *Job stress: Risk factors, health effects and coping strategies* (pp. 22–48). Nova Science Publishers.

Sianoja, M., Kinnunen, U., de Bloom, J., Korpela, K., & Geurts, S. (2016). Recovery during lunch breaks: Testing long-term relations with energy levels at work. *Scandinavian Journal of Work and Organizational Psychology*, *1*, 1–12. https://doi.org/10.16993/sjwop.13

Sianoja, M., Syrek, C. J., de Bloom, J., Korpela, K., & Kinnunen, U. (2018). Enhancing daily well-being at work through lunchtime park walks and relaxation exercises: Recovery experiences as mediators. *Journal of Occupational Health Psychology*, *23*, 428–442. https://doi.org/10.1037/ocp0000083

Simbula, S. (2010). Daily fluctuations in teachers' well-being: A diary study using the job demands-resources model. *Anxiety, Stress & Coping*, *23*, 563–584. https://doi.org/10.1080/10615801003728273

Skaalvik, E. M., & Skaalvik, S. (2015). Job satisfaction, stress and coping strategies in the teaching profession-what do teachers say? *International Education Studies*, *8*, 181–192. https://doi.org/10.5539/ies.v8n3p181

Skaalvik, E. M., & Skaalvik, S. (2017). Still motivated to teach? A study of school context variables, stress and job satisfaction among teachers in senior high school. *Social Psychology of Education*, *20*, 15–37. https://doi.org/10.1007/s11218-016-9363-9

Sonnentag, S. (2018). The recovery paradox: Portraying the complex interplay between job stressors, lack of recovery, and poor well-being. *Research in Organizational Behavior*, *38*, 169–185. https://doi.org/10.1016/j.riob.2018.11.002

Sonnentag, S., Eck, K., Fritz, C., & Kühnel, J. (2019). Morning reattachment to work and work engagement during the day: A look at day-level mediators. *Journal of Management*. *46*(8), 1408–1435. https://doi.org/10.1177/0149206319829823

Sonnentag, S., & Fritz, C. (2007). The recovery experience questionnaire: Development and validation of a measure for assessing recuperation and unwinding from work. *Journal of Occupational Health Psychology*, *12*, 204–221. https://doi.org/10.1037/1076-8998.12.3.204

Sonnentag, S., & Fritz, C. (2015). Recovery from job stress: The stressor-detachment model as an integrative framework. *Journal of Organizational Behavior*, *36*, S72–S103. https://doi.org/10.1002/job.1924

Sonnentag, S., & Jelden, S. (2009). Job stressors and the pursuit of sport activities: A day-level perspective. *Journal of Occupational Health Psychology*, *14*, 165–181. https://doi.org/10.1037/a0014953

Sonnentag, S., & Kühnel, J. (2016). Coming back to work in the morning: Psychological detachment and reattachment as predictors of work engagement. *Journal of Occupational Health Psychology*, *21*, 379–390. https://doi.org/10.1037/ocp0000020

Sonnentag, S., Venz, L., & Casper, A. (2017). Advances in recovery research: What have we learned? What should be done next? *Journal of Occupational Health Psychology*, *22*, 365–380. https://doi.org/10.1037/ocp0000079

Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: Interpersonal conflict at work scale, organizational constraints scale, quantitative workload inventory, and physical symptoms inventory. *Journal of Occupational Health Psychology*, *3*(4), 356–367.

Steidle, A., Gonzalez-Morales, M. G., Hoppe, A., Michel, A., & O'shea, D. (2017). Energizing respites from work: A randomized controlled study on respite interventions. *European Journal of Work & Organizational Psychology*, *26*, 650–662. https://doi.org/10.1080/1359432X.2017.1348348

Steiger, J. H. (2007). Understanding the limitations of global fit assessment in structural equation modeling. *Personality and Individual Differences*, *42*, 893–898. https://doi.org/10.1016/j.paid.2006.09.017

Thrash, T. M., Elliot, A. J., Maruskin, L. A., & Cassidy, S. E. (2010). Inspiration and the promotion of well-being: Tests of causality and mediation. *Journal of Personality and Social Psychology*, *98*, 488–506. https://doi.org/10.1037/a0017906

Trougakos, J. P., Beal, D. J., Green, S. G., & Weiss, H. M. (2008). Making the break count: An episodic examination of recovery activities, emotional experiences, and positive affective displays. *Academy of Management Journal*, *51*, 131–146. https://doi.org/10.5465/amj.2008.30764063

Trougakos, J. P., Hideg, I., Cheng, B. H., & Beal, D. J. (2014). Lunch breaks unpacked: The role of autonomy as a moderator of recovery during lunch. *Academy of Management Journal*, *57*, 405–421. https://doi.org/10.5465/amj.2011.1072

Unterbrink, T., Zimmermann, L., Pfeifer, R., Wirsching, M., Brähler, E., & Bauer, J. (2008). Parameters influencing health variables in a sample of 949 German teachers. *International Archives of Occupational and Environmental Health*, *82*, 117–123. https://doi.org/10.1007/s00420-008-0336-y

Ursin, H., & Eriksen, H. R. (2004). The cognitive activation theory of stress. *Psychoneuroendocrinology*, *29*, 567–592. https://doi.org/10.1016/S0306-4530(03)00091-X

Van Hooff, M. L. M., & de Pater, I. E. (2017). Let's have fun tonight: The role of pleasure in daily recovery from work. *Applied Psychology*, *66*, 359–381. https://doi.org/10.1111/apps.12098

Van Hooff, M. L. M., Flaxman, P. E., Söderberg, M., Stride, C. B., & Geurts, S. A. E. (2018). Basic psychological need satisfaction, recovery state, and recovery timing. *Human Performance*, *31*, 125–143. https://doi.org/10.1080/08959285.2018.1466889

Van Hooff, M. L. M., & Geurts, S. A. E. (2014). Need satisfaction during free evening hours: Examining its role in daily recovery. *Stress and Health*, *30*, 198–208. https://doi.org/10.1002/smi.2595

Van Veldhoven, M. J. P. M., & Broersen, S. (2003). Measurement quality and validity of the "need for recovery scale". *Occupational and Environmental Medicine*, *60*(suppl 1), i3–i9

Venz, L., Bosch, C., Pinck, A. S., & Sonnentag, S. (2019). Make it your break! Benefits of person-break fit for post-break affect. *Occup Health Sci*, *3*, 167–186. https://doi.org/10.1007/s41542-019-00036-2

Verbeek, J., Ruotsalainen, J., Laitinen, J., Korkiakangas, E., Lusa, S., Mänttäri, S., & Oksanen, T. (2018). Interventions to enhance recovery in healthy workers; a scoping review. *Occupational Medicine*, *69*, 54–63. https://doi.org/10.1093/occmed/kqy141

Von Dreden, C., & Binnewies, C. (2017). Choose your lunch companion wisely: The relationships between lunch break companionship, psychological detachment, and daily vigour. *European Journal of Work & Organizational Psychology*, *26*, 356–372. https://doi.org/10.1080/1359432X.2017.1301428

Warr, P. (1990). The measurement of well-being and other aspects of mental health. *Journal of Occupational Psychology*, *63*(3), 193–210.

Warr, P. (2012). How to think about and measure psychological well-being. In R. R. Sinclair, M. Wang, & L. E. Tetrick (Eds.), *Research methods in occupational health psychology* (pp. 100–114). Routledge.

Waterman, A. S. (2005). When effort is enjoyed: Two studies of intrinsic motivation for personally salient activities. *Motivation and Emotion*, *29*(3), 165–188.

Wendsche, J., & Lohmann-Haislah, A. (2017). A meta-analysis on antecedents and outcomes of detachment from work. *Frontiers in Psychology*, *7*, 2072. https://doi.org/10.3389/fpsyg.2016.02072

Zhang, Q., & Sapp, D. A. (2008). A burning issue in teaching: The impact of perceived teacher burnout and nonverbal immediacy on student motivation and affective learning. *Journal of Communication Studies*, *1*, 152–168.

Zijlstra, F. R. H., & Sonnentag, S. (2006). After work is done: Psychological perspectives on recovery from work. *European Journal of Work & Organizational Psychology*, *15*, 129–138. https://doi.org/10.1080/13594320500513855

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