

Not detaching from work during leisure time: A control-theory perspective on job-related cognitions

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Summary

Lack of psychological detachment from work during leisure time is related to unfavorable affective states and poor well-being but little is known about the processes that drive this relationship. We propose that lack of detachment from work translates into next-day negative and positive affect by specific thought processes. Building on a control-theory approach to repetitive thought and rumination, we introduce a refined conceptualization of job-related cognitions during leisure time that integrates a valence perspective (referring to negative versus positive events) with a temporal-direction perspective (backward-oriented vs. forward-oriented). Using daily-survey data collected from 243 employees over two workweeks, multilevel path analysis revealed that lack of detachment from negative events predicted backward-oriented negative rumination and forward-oriented solution seeking. Lack of detachment from positive events predicted backward-oriented positive rumination and forward-oriented goal generation. Only backward-oriented negative rumination, in turn, predicted next-day negative affect. Neuroticism and extraversion moderated the relationships between lack of detachment and job-related cognitions, resulting in a particularly strong serial indirect effect between lack of detachment from negative events and next-day negative affect for persons high in neuroticism. Our study helps to understand why and for whom lack of psychological detachment from work during leisure time is particularly adverse.

KEYWORDS

affect, control theory, daily survey, job-related cognitions, psychological detachment from work, rumination

1 | INTRODUCTION

Work in today's economy is highly demanding. Due to high cognitive and emotional demands, many employees experience tension and stress (American Psychological Association, 2021; Health and Safety Executive, 2022). High job demands are related to poor well-being (Gonzalez-Mulé et al., 2021; Guthier et al., 2020) and even may result in premature death (Gonzalez-Mulé & Cockburn, 2017). To counteract

the negative consequences of highly demanding work, employees need to recover during leisure time (Bennett et al., 2018; Zijlstra et al., 2014). Research has identified leisure-time psychological detachment from work as a crucial aspect of a successful recovery process (Sonnentag & Fritz, 2015). Psychological detachment from work refers to an employee's "sense of being away from the work situation" (Etzion et al., 1998, p. 579). It implies mentally distancing oneself from one's work and to temporarily forget about work during

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leisure time. Meta-analyses showed that lack of psychological detachment from work is associated with unfavorable affective outcomes and impaired well-being (Bennett et al., 2018; Steed et al., 2021).

While this line of research has emphasized the overall downsides of not detaching from work, important questions remain unanswered. First, the mechanisms underlying the relationship between lack of detachment and unfavorable outcomes are far from understood. It remains unclear why staying mentally connected to work after the end of the workday translates into unfavorable affective states. In particular, there is a paucity of research on the specific cognitions that drive the relationship between lack of detachment from work and subsequent affect. Second, while most research has portrayed detachment from work during leisure time as desirable (Sonnentag & Fritz, 2015), initial evidence, however, suggests that not detaching from positive aspects of one's work can be beneficial for affect and well-being (Sonnentag & Niessen, 2020; Wendsche & Lohmann-Haislah, 2017). Thus, there may be differences between the mechanisms that connect lack of detachment from negative versus positive aspects of one's work to subsequent affect. Third, research has neglected the role of personality in recovery in general, and particularly in psychological detachment (Sonnentag et al., 2022). This omission is unfortunate because it is well known that personality exerts a crucial influence on people's reactions to work-related experiences (Iliescu et al., 2017; Lanaj et al., 2016). Without taking personality into account, we cannot fully understand psychological detachment because we might falsely assume that the consequences of lack of detachment are the same for everyone.

To overcome the limitations of previous research and to better understand the processes that make lack of psychological detachment from work detrimental, we pursue three goals in our study: First, we aim to test the mechanisms that translate lack of detachment from work into negative affect and positive affect. We address specific job-related cognitions as explanatory processes that link psychological detachment from work to subsequent affect. To this end, we present a refined conceptualization of job-related cognitions based on a control-theoretical approach to repetitive thought and rumination (Carver & Scheier, 1998; Watkins, 2008). Second, building on initial insights that the benefits of various types of detachment differ

(Sonnentag & Niessen, 2020; Wendsche & Lohmann-Haislah, 2017), we examine how lack of psychological detachment from negative versus positive events relate to distinct cognitive processes and subsequent affect. Third, we address the role of personality in the process that links lack of psychological detachment from work to affect, by examining neuroticism and extraversion as moderators. We focus on neuroticism and extraversion because these two personality dimensions are highly relevant for cognitive (Muris et al., 2005; Wood et al., 2003) and affective processes (Diener & Lucas, 1999; Ozer & Benet-Martinez, 2006). Figure 1 shows our conceptual model.

We aim to make three main contributions. First, our research helps to better understand why lack of psychological detachment from work during leisure time translates into unfavorable affective states. We demonstrate that a differentiation is needed between psychological detachment from negative versus positive work events, going beyond the unidimensional perspective of psychological detachment that still dominates the literature (Headrick et al., 2023). We also examine the cognitive mechanisms that potentially link lack of detachment from negative versus positive events to subsequent affective states. Affective states play an important role in organizational life as they impact relevant behaviors, including creativity (Amabile et al., 2005), interactions among coworkers (Nesher Shoshan & Venz, 2022), and counterproductive work behavior (Koopman et al., 2021). By addressing the cognitive processes that transmit lack of detachment into the next workday, we advance recovery research. Whereas past research has examined if certain recovery experiences relate to subsequent affect, we address the processes underlying the relationship between psychological detachment—as a specific recovery experience—and next-day affect.

Second, with our differentiated conceptualization of job-related cognitions during leisure time, we advance the literature on job-related cognitions in general and on job-related rumination in particular (Jimenez et al., 2022; Weigelt et al., 2019). Until now, research on job-related rumination has either adopted a unidimensional view on rumination (Pindek et al., 2022; Wang et al., 2013), captured just some aspects of negative versus positive rumination (Fritz & Sonnentag, 2006; Frone, 2015), or used confounded and relatively unspecific measures for various rumination modes (Cropley

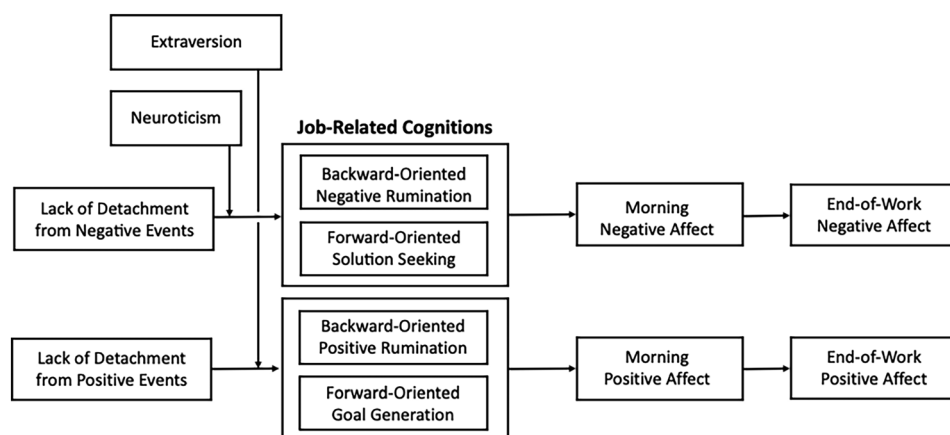


FIGURE 1 Conceptual model. Model shows hypothesized paths only.

et al., 2012; see Table S1 for more details). In our research, we overcome these limitations and provide an integrative control-theory perspective. This perspective combines the valence dimension with a temporal-direction dimension, moving the rumination literature forward and helping to improve the theoretical understanding of why lack of detachment relates to subsequent affect. With this approach, we demonstrate how control theory can be fruitfully applied within recovery research.

Finally, as our third contribution, we shed light on neuroticism and extraversion as potentially impactful factors in the recovery process. Numerous studies have demonstrated that neuroticism and extraversion impact important work-related outcomes (Judge et al., 2002; Wilmot et al., 2019). It is important to note that extraversion does not only allude to a person's tendency to be sociable and assertive (McCrae & Costa, 1987) but also their tendency to be sensitive to rewards, enjoy pleasant situations, and experience positive affect (Lucas & Diener, 2001).

Although neuroticism and extraversion might not be the only individual-difference variables that moderate the process from lack of detachment to subsequent affect, they should be particularly relevant moderators in our study because they fundamentally influence a person's cognitions and affect (Muris et al., 2005; Robinson, 2007; Wood et al., 2003). Specifically, the inclination of persons high in neuroticism to focus on the negative (Robinson, 2007) makes them highly susceptible to cognitions that focus on negative events, whereas extraverts tend to focus on the positive (Robinson, 2007), making them more prone to engaging in cognitions that focus on positive events. As a consequence, the association between lack of detachment from work and next-day affect will depend on a person's level of neuroticism and extraversion: Lack of detachment from negative events will be more detrimental at higher levels of neuroticism because a high level of neuroticism makes it more likely that a person remains "trapped" in negative thoughts. Lack of detachment from positive events will be more beneficial at higher levels of extraversion because a high level of extraversion helps to savor positive thoughts.

By showing that the cognitive consequences of not detaching from work differ between persons with high versus low neuroticism and extraversion, respectively, our research illustrates how neuroticism and extraversion impact the recovery process. As the study of personality has been largely neglected in past research on recovery (Sonnentag et al., 2022), our study points to personality as a promising factor that can help to better understand for whom psychological detachment from work during leisure time is particularly important.

2 | PSYCHOLOGICAL DETACHMENT FROM WORK

Etzion et al. (1998) introduced the concept of psychological detachment from work to the organizational literature. The core feature of psychological detachment is the creation of a mental distance to work while being physically away from work. Broad empirical evidence demonstrates that lack of psychological detachment from work during

leisure time is associated with unfavorable affective outcomes. For instance, people who generally detach less from work report higher levels of impaired well-being, including negative affect and fatigue (Bennett et al., 2018; Steed et al., 2021). Studies using day-level designs showed that on evenings when people detach less from work, they experience higher levels of negative affective states (Derks et al., 2014; Eichberger et al., 2021).

Although these findings are noteworthy, most studies on psychological detachment remain surprisingly vague about the specific content from which people need to detach so that they can recover. To better understand the implications of lack of detachment from work for subsequent affect, we differentiate between lack of detachment from negative work events (e.g., computer breakdown, argument with a rude co-worker) and from positive work events (e.g., positive feedback from one's boss, grateful customer). The general idea underlying our research is that lack of detachment from negative events should be unfavorable, resulting in an increase in negative affect, via negatively toned cognitions. Lack of detachment from positive events, however, should be more benign, resulting in an increase in positive affect via positively toned cognitions.

3 | JOB-RELATED COGNITIONS DURING LEISURE TIME

We propose that lack of detachment from work during leisure time relates to subsequent affective states via various types of job-related cognitions. These cognitions include reflections about what has happened at work during the past workday as well as worries and plans for the future (Song et al., 2024). To develop a differentiated view on job-related cognitions, we build on earlier conceptualizations of job-related cognitions during leisure time (Meier et al., 2016; Querstret & Cropley, 2012) and align them with a control-theory approach (Carver & Scheier, 1998). Specifically, we build on control-theory perspectives on repetitive thought and rumination (Martin & Tesser, 1996; Watkins, 2008).

Within this control-theory approach, two dimensions of ruminative cognitions are important. The first dimension refers to the valence of the cognition, the second to its temporal direction. In terms of valence, negative cognitions occur as a response to negative events, for instance, when failing to reach an important goal or when noticing a discrepancy between the present and a desired situation (Martin & Tesser, 1996). This discrepancy can even refer to a mismatch between an actual and a desired affective state (Larsen, 2000; Watkins, 2008). Positive cognitions occur as a response to positive events, for instance, when making unforeseen progress toward a goal. In terms of temporal direction, the control-theory perspective implies that ruminative cognitions can either focus on the present situation (i.e., negative events indicating a discrepancy between the actual and a desired state and positive events indicating the attainment of a desired state) or on future steps to overcome negative events (i.e., reduce an actual discrepancy) or to take advantage of positive events (i.e., create a new discrepancy; cf. Watkins, 2008).

Combining both dimensions, negative cognitions occurring as a response to a negative event can revolve around the event itself and be highly perseverative and backward-oriented. We call these negatively toned cognitions focusing on negative events *backward-oriented negative rumination*. Importantly, cognitions emerging from a negative event can also be future-oriented and address possible ways of reducing the discrepancy between the actual and a desired state, for instance, by searching for ways to solve a problem or leaving the situation. We call these cognitions that emerge from a negative event and focus on overcoming the undesired situation *forward-oriented solution seeking*.

Positive cognitions that occur as response to positive events refer to experiences of savoring (Bryant, 2021) and basking (Martin & Tesser, 1996). Thereby, cognitions focus on positive things that have happened, for instance, after reducing the discrepancy between an actual and a desired state or after exceeding a previously set goal (Carver, 2004). We call these positively toned cognitions with a focus on what has happened *backward-oriented positive rumination*. Cognitions originating from positive events can also take a future-oriented perspective. Such cognitions may not be complacent with having experienced a positive event but may go beyond the status quo by creating a new discrepancy (Phillips et al., 1996; Scherbaum & Vancouver, 2010). We call these cognitions emerging from positive events and focusing on prospective goals and activities *forward-oriented goal generation*.

Within one's daily life, backward-oriented and forward-oriented thoughts can be highly intertwined: For instance, when engaging in backward-oriented negative rumination, one may easily jump to forward-oriented thoughts searching for a solution and then switching back to backward-oriented rumination. Likewise, backward-oriented positive rumination can be a steppingstone for forward-oriented goal generation, followed by backward-oriented rumination again. Although the various types of cognitions might be closely connected empirically, they need to be differentiated in conceptual terms.

Importantly, job-related cognitions are conceptually closely related to lack of detachment in that they detail the thoughts that arise when people do not detach from work. These cognitions, therefore, can be seen as specific instantiations of not detaching from work. However, they also conceptually differ from (lack of) detachment. Whereas the concept of psychological detachment remains rather vague about what actually happens when not detaching from work, job-related cognitions, as framed in this paper, are more explicit about various modes of thinking about work by including a backward-oriented and forward-oriented temporal perspective.

4 | LACK OF PSYCHOLOGICAL DETACHMENT FROM WORK AND JOB-RELATED COGNITIONS

We suggest that lack of detachment from negative work events is related to backward-oriented negative rumination and forward-oriented solution seeking. Not detaching from negative work events

implies that these events remain mentally activated after work. This mental activation may, for instance, refer to a discrepancy situation when a relevant task-related or interpersonal goal is not met or when actual emotional experiences do not match desired emotional experiences (Larsen, 2000; Watkins, 2008). Typically, this activation does not easily dissipate (Wang et al., 2013) but leads to increased job-related cognitions later during the evening.

In control-theory terms, these job-related cognitions are fueled by a persisting discrepancy between an actual and desired state (Martin & Tesser, 1996), for instance when a negative event occurred. These cognitions are often reactive as they focus on negative events and their potential causes. Thus, not detaching from negative events increases the likelihood that later during the evening job-related cognitions occur and that these cognitions are dominated by negative ruminative thoughts about what has happened and why it happened.

According to the control-theory approach to repetitive thought and rumination, cognitions centering around negative events will not only be reactive in nature but can also address possible ways of resolving the negative situation. In control-theory terms, this means reducing the discrepancy between the current and a more desirable future state. For instance, one might think about how to behave when encountering a rude co-worker again the next day. Accordingly, we suggest that employees who do not detach from negative work events will not only engage in negative reactive thoughts later during the evening but also in forward-oriented cognitions with the expectation that this will help to overcome the negative situation and to attain positive outcomes (Ciarocco et al., 2010).

Hypothesis 1. Lack of detachment from negative events is positively related to (a) backward-oriented negative rumination and (b) forward-oriented solution seeking later during the evening.

Similarly, when not detaching from positive work events, these events stay mentally activated after work. Mental activation of a positive event may, for instance, reflect major progress toward a relevant goal or toward a desired emotional state. When these positive events remain mentally activated, further positive thoughts occur, including positive self-evaluations (Gentzler et al., 2016) that may help in pursuing future goals and in continuing to work toward longer term goals (Erez & Judge, 2001). Thus, when not detaching from positive events, continued job-related cognitions will be dominated by positive content.

These job-related thoughts may not be limited to backward-oriented cognitions, such as savoring achievements, but may also point into the future by deliberating on what needs to be done next. Positive emotions and increased self-efficacy resulting from the mental representation of positive events when not detaching from them (cf., Sytine et al., 2019; Zautra et al., 2005) facilitate increased levels of proactivity (Parker et al., 2010) that may start with forward-oriented thoughts during the evening. Moreover, positive emotions and high self-efficacy provide a favorable psychological background, making it easier to tolerate feelings of uncertainty and anticipatory

stress (Fredrickson, 1998). Accordingly, we suggest that when not detaching from positive events, employees will engage in backward-oriented positive rumination as well as in forward-oriented goal generation later during the evening.

Hypothesis 2. Lack of detachment from positive events is positively related to (a) backward-oriented positive rumination and (b) forward-oriented goal generation later during the evening.

4.1 | Job-related cognitions and subsequent affect

We propose that job-related cognitions during the evening predict next-day affect. Such affective consequences of job-related cognitions during the evening will be reflected in affect experienced in the morning and may persist until the end of the workday. Thus, the affective impact of job-related cognitions may not be a rather short-lived phenomenon but may color the entire workday. To portray processes occurring at the day level, we examine affect as “feeling states” (i.e., “in-the-moment, short-term affective experiences”; Barsade & Gibson, 2007, p. 37) and differentiate between negative and positive states. Because high-arousal states are particularly relevant in the work context (Warr et al., 2014), we focus on high-arousal (i.e., high-activation) negative and positive affect, which are quite independent affective experiences at the day level (Watson, 1988). High negative affect is characterized by states such as distress, anxiety, or anger, whereas high positive affect is characterized by states such as enthusiasm, energy, mental alertness, or determination (Watson, 1988).

We expect that cognitions originating from negative events are related to morning negative affect. During backward-oriented negative rumination or forward-oriented solution seeking, the person focuses on negative situations that have happened, on negative feelings associated with what has happened, and possible negative consequences. Importantly, thought content with a negative valence is highly salient within these cognitions.

Empirical research showed that negative thought content is related to subsequent negative affective states (M. Wang et al., 2013; Westermann et al., 1996). For instance, in a daily-survey study using a broad conceptualization of negative work reflection, Meier et al. (2016, Study 2) reported that negative thoughts about one's work during the evening were associated with subsequent angry mood. Using an experimental design, Sonnentag and Niessen (2020) found that induced negative thoughts about work predicted an increase in negative affect. Because negative content is highly salient within backward-oriented negative rumination and forward-oriented solution seeking, we expect that these types of job-related cognition are positively related to subsequent negative affect.

Hypothesis 3. (a) Backward-oriented negative rumination and (b) forward-oriented solution seeking during the evening predict morning negative affect.

Both backward-oriented negative rumination and forward-oriented solution seeking center around negative thought content. However, these two types of job-related cognitions emphasize different temporal directions. In contrast to backward-oriented negative rumination, forward-oriented solution seeking promises an improved future situation what should dampen negative affect (Chishima et al., 2021). Moreover, focusing on a potential solution for a problem—a core feature of forward-oriented solution seeking—should alleviate negative affect (Grant, 2012). Accordingly, compared with the relationship between backward-oriented negative rumination and subsequent negative affect, the relationship between forward-oriented solution seeking and subsequent negative affect should be weaker.

Hypothesis 3c. The relationship between backward-oriented negative rumination during the evening and morning negative affect is stronger than the relationship between forward-oriented solution seeking during the evening and morning negative affect.

We expect that job-related cognitions during leisure time not only predict morning affect but also affect experienced later that day. Because affective states show some degree of stability over the course of the day (Sonnentag & Starzyk, 2015), negative rumination and negatively toned solution seeking should be related to end-of-work negative affect via morning negative affect. In addition, morning negative affect may stimulate maladaptive behaviors (Rothbard & Wilk, 2011) that, in turn, contribute to further negative affect (Scott & Barnes, 2011). Because lack of detachment from negative events should be positively related to backward-oriented negative rumination and forward-oriented solution seeking, which in turn should be related to end-of-work negative affect via morning negative affect, we suggest a serial indirect relationship between lack of detachment from negative events and end-of-work negative affect.

Hypothesis 4. Lack of detachment from negative events shows a serial indirect positive relationship with end-of-work negative affect, via (a) backward-oriented negative rumination and morning negative affect and via (b) forward-oriented solution seeking and morning negative affect.

Hypothesis 3c states that the relationship between backward-oriented negative rumination and morning negative affect will be stronger than the relationship between forward-oriented solution seeking and morning negative affect. Accordingly, we expect the serial indirect relationship between lack of detachment from negative events and end-of-work negative affect to be stronger via backward-oriented negative cognitions and morning negative affect than via forward-oriented solution seeking and morning negative affect.

Hypothesis 4c. The serial indirect positive relationship between lack of detachment from negative events and end-of-work negative affect via backward-oriented

negative rumination and morning negative affect is stronger than the serial indirect positive relationship between lack of detachment from negative events and end-of-work negative affect via forward-oriented solution seeking and morning negative affect.

Cognitions that originate from positive events should be related to morning positive affect. During backward-oriented positive rumination and forward-oriented goal generation, a person's focus is on positive situations and positive feelings about these situations. During forward-oriented goal generation, the person may think about possible future actions to attain a desirable higher order goal. Thus, thought content with a positive valence is highly salient within these cognitions. Empirical research has shown that positive thought content predicts positive affective states (Meier et al., 2016; Westermann et al., 1996). For instance, relying on a broad measure of positive reframing and other cognitive-coping behaviors, Eichberger et al. (2021) found that these positive thoughts were strongly related to day-level positive affect. Taken together, because positive content is highly salient within backward-oriented positive rumination and forward-oriented goal generation, we expect that these types of job-related cognition are positively related to subsequent positive affect.

Hypothesis 5. (a) Backward-oriented positive rumination and (b) forward-oriented goal generation during the evening predict morning positive affect.

Despite the high salience of positive thoughts in both backward-oriented positive rumination and forward-oriented goal generation, these types of job-related cognitions differ in one important aspect. Backward-oriented positive rumination focuses on savoring and capitalizing on what has already been achieved (Bryant, 2021). Forward-oriented goal generation, in contrast, might increase one's awareness of future problems, which might distract from the positive experience and dampen positive affect (Quoidbach et al., 2010). Thus, although forward-oriented goal generation will be positively related to positive affect because it is rooted in positive events (Morris, 1989) and aligns with desirable goals (J. F. Wang & Milyavskaya, 2020), positive affective consequences will be lower than when directing one's full attention to an already experienced positive situation as is the case during backward-oriented positive rumination. Accordingly, compared with the relationship between backward-oriented positive rumination and subsequent positive affect, the relationship between forward-oriented goal generation and subsequent positive affect should be weaker.

Hypothesis 5c. The relationship between backward-oriented positive rumination during the evening and morning positive affect is stronger than the relationship between forward-oriented goal generation during the evening and morning positive affect.

We expect job-related cognitions during leisure time to be related to end-of-work positive affect as well. Specifically, backward-oriented

positive rumination and forward-oriented goal generation should be related to end-of-work positive affect via morning positive affect. As with negative affect, positive affect shows some degree of stability over the course of the day (Sonnentag & Starzyk, 2015). In addition, morning positive affect facilitates favorable behaviors and experiences (Hur et al., 2020), which in turn increase positive affect (Nesher Shoshan & Venz, 2022). Because lack of detachment from positive events should be positively related to backward-oriented positive rumination and forward-oriented goal generation, which in turn should have positive relationships with end-of-work positive affect via morning positive affect, we suggest a serial indirect relationship between lack of detachment from positive events and end-of-work positive affect.

Hypothesis 6. Lack of detachment from positive events shows a serial indirect positive relationship with end-of-work positive affect, via (a) backward-oriented positive rumination and morning positive affect and via (b) forward-oriented goal generation and morning positive affect.

Again, the strength of the serial indirect effect should depend on the temporal direction of the cognitions. As hypothesized above, the relationship between backward-oriented positive rumination and morning positive affect should be stronger than the relationship between forward-oriented goal generation and morning positive affect. Thus, the serial indirect relationship between lack of detachment from positive events and end-of-work positive affect should also be stronger via backward-oriented positive rumination cognitions and morning positive affect than via forward-oriented goal generation and morning positive affect.

Hypothesis 6c. The serial indirect positive relationship between lack of detachment from positive events and end-of-work positive affect via backward-oriented positive rumination cognitions and morning positive affect is stronger than the serial indirect positive relationship between lack of detachment from positive events with end-of-work positive affect via forward-oriented goal generation and morning positive affect.

5 | THE ROLE OF NEUROTICISM AND EXTRAVERSION

People differ in their reactions to work experiences. Among the broad range of individual-difference variables that contribute to people's differential reactions, neuroticism and extraversion are particularly influential because they represent fundamental personality dimensions that regulate cognition, affect, and behavior (Carver, 2013; Elliot & Thrash, 2002). In general, research has shown that aversive experiences at work are most harmful for persons high on neuroticism and low on extraversion (Iliescu et al., 2017; Johnson et al., 2014). Building

on this earlier research, we propose that the strength of relationships between lack of detachment from work and job-related cognitions during leisure time depend on a person's level of neuroticism and extraversion.

Neuroticism is the disposition toward experiencing negative affective states such as anxiety, hostility, guilt, and worry (Costa & McCrae, 1980). Persons high in neuroticism focus more on negative stimuli (Hampson, 2012) and respond more negatively to negative events (Bolger & Zuckerman, 1995; Zautra et al., 2005). They tend to engage more in negative thought processes (Muris et al., 2005; Roelofs et al., 2008), particularly after negative experiences (Pavani et al., 2017). Accordingly, persons high in neuroticism will continue to focus more intensely on negative thoughts when they do not detach from the negative events. Thus, for them it is more likely that lack of detachment from negative events translates into backward-oriented negative rumination.

In addition, neuroticism should also strengthen the relationship between lack of detachment from negative events and forward-oriented solution seeking. Although neuroticism is associated with low problem-solving behavior (Connor-Smith & Flachsbart, 2007) and a passive and avoidant behavioral style toward problems (D'Zurilla et al., 2011), it has been found to be positively related to problem-solving pondering, a ruminative style that aims at solving problems (Hamesch et al., 2014; Weigelt et al., 2019). Thus, although persons high in neuroticism may tend to not show actual problem-solving behavior, they are inclined to ruminate about how they could solve problems. Accordingly, when not detaching from negative events they will engage more in forward-oriented solution seeking.

Hypothesis 7. Neuroticism influences the relationships between lack of detachment from negative events and (a) backward-oriented negative rumination and (b) forward-oriented solution seeking during the evening. The higher the neuroticism level, the stronger the positive relationship between lack of detachment from negative events and (a) backward-oriented negative rumination and (b) forward-oriented solution seeking.

Extraversion is the disposition to experience positive emotions and to be warm, assertive, active, and gregarious (Costa & McCrae, 1988). Persons high in extraversion are more likely to experience positive affective states (Costa & McCrae, 1980). They are more sensitive to rewards (Lucas et al., 2000) and react more strongly to positive events (Larsen & Ketelaar, 1989; Zautra et al., 2005). Because they are highly sensitive to rewards and tend to savor positive experiences (Wood et al., 2003), persons high in extraversion will pay particular attention to the positive sides of their work when they do not detach from work during leisure time. Accordingly, it is more likely for extraverts that lack of detachment from positive events translates into backward-oriented positive rumination.

In addition, extraversion should also strengthen the relationship between lack of detachment from positive events and forward-

oriented goal generation, that is, cognitions that address next action steps resulting from positive events and experiences. Persons high in extraversion are more promotion-focused, engage more in goal setting, and have a higher self-efficacy (Wilmot et al., 2019), constituting important motivational prerequisites for addressing future challenges and being proactive (Tornau & Frese, 2013). Accordingly, when extraverted persons do not detach from positive events, they can use the mental presence of these positive events as motivational drivers for future actions, for instance, by placing greater value on future positive experiences (Smillie, 2013). Therefore, extraverts' lack of detachment from positive events will also manifest itself in forward-oriented goal generation.

Hypothesis 8. Extraversion influences the relationships between of lack of detachment from positive events and (a) backward-oriented positive rumination and (b) forward-oriented goal generation during the evening. The higher the extraversion level, the stronger the positive relationship between lack of detachment from positive events and (a) backward-oriented positive rumination and (b) forward-oriented goal generation.

6 | METHOD

6.1 | Study procedure

This study was part of a larger study on recovery processes.¹ We recruited participants in German-speaking countries via advertisements on social-media sites (e.g., Xing, Facebook). Eligibility criteria included working at least 20 h and at least 4 days per week, not doing shift work or being self-employed, and being at least 18 years old. Depending on their individual compliance rates, participants received up to 35 Euro as incentive. The Ethics Review Board of the University of Mannheim approved the study protocol (number: 10/2019).

Participants first completed an entrance survey that assessed neuroticism, extraversion, and demographic data. Upon completion of this entrance survey, we asked participants to complete three daily surveys, over a period of 2 weeks (i.e., up to 10 workdays). We sent E-mail links to the daily surveys at three time points (morning, end-of-work, evening), tailored to participants' individual work schedules. A total of 302 persons completed the entrance survey, of whom 291 continued with the daily-survey assessment.

To ensure high data quality, we excluded daily survey data that showed signs of careless responding (e.g., longstring; Meade & Craig, 2012) or noncompliance with the specific instructions about when to complete the surveys. Specifically, we excluded morning surveys not completed within 1 h after starting work, end-of-work surveys not completed 1 h before and 2 h after the end of the work, and evening surveys completed too early (i.e., not at least 1 h after the end of

¹The study by Wiegmann et al. (2023) is based on the same data collection, without variable overlap.

work and not at least 30 min after completion of the end-of-work survey). We chose these tailored compliance criteria so that the actual survey completion times would be close enough to the optimal completion times (e.g., when beginning and finishing work) and that would still allow some leeway due to unforeseen constraints during daily life (e.g., last-minute duties at work, catching public transport). In addition, because our analysis required within-person variation on the relevant constructs, we discarded daily surveys from participants who completed the respective type of daily survey on only one day.

After excluding careless responses, daily surveys not completed at the assigned time points, and single-day responses, we retained 2200 morning surveys (completed on average at 7:16 AM) from 266 persons, 1538 end-of-work surveys (completed on average at 4:50 p.m.) from 245 persons, and 1815 evening surveys (completed on average at 8:20 PM) from 241 persons. For data analyses, we matched evening data from day *d* (providing lack-of-detachment data), morning data from day *d* + 1 (providing evening-cognition and morning-affect data), and end-of-work data from day *d* + 1 (providing end-of-work affect data and control variables). We allowed missing values in the end-of-work and evening surveys. Because on Monday mornings no job-related cognition measures referring to the previous evening were available, we retained a maximum of eight day-level data sets per participant, resulting in an overall data set of 1699 days from 243 participants (6.99 days per participant).

6.2 | Sample

Within the final sample of 243 persons (63.8% female), the mean age was 36.5 years ($SD = 9.2$). Mean job tenure was 4.7 years ($SD = 5.7$). Most participants (70.4%) worked between 36 and 45 h per week. Overall, participants were highly educated with 71.6% holding a university degree. Participants were employed in a broad range of different jobs, particularly within management (26.0%), office administration (21.2%), information technology, engineering, and related fields (20.2%), as well as service (9.7%).

We compared the 243 participants whose daily-survey data were included in the analysis with the 59 persons who completed the entrance survey but did not provide usable daily-survey data. Participants included in the analysis did not differ from persons who dropped out after completing the entrance survey with respect to age ($M = 37.3$, $SD = 9.1$ vs. $M = 36.5$, $SD = 9.2$, $t = 0.621$, $df = 300$, $p = 0.541$), tenure ($M = 4.9$, $SD = 6.0$ vs. $M = 4.7$, $SD = 5.7$, $t = 0.345$, $df = 300$, $p = 0.730$), or education (71.6% vs. 71.2% with university degree, $\chi^2 = 0.004$, $df = 1$, $p = .949$). However, women tended to be more likely to be included in the final data set than men (63.8% women in final sample vs. 57.6% women among dropouts, $\chi^2 = 4.661$, $df = 1$, $p = .097$).

We planned our sample size based on Arend and Schäfer's (2019) simulation research. Their results suggest that a sample size of 200 persons with 7 days per person is sufficient for detecting even small effects at Level 1 and for detecting medium-sized cross-level

interaction effects when the random slope variance is large or for detecting large cross-level interaction effects when the random slope variance is medium-sized.

6.3 | Measures

We administered all items in German. For items that were not available in German, we applied a translation-backtranslation procedure (Brislin, 1970). Unless reported otherwise, participants responded to all items on a 5-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Table 1 reports means, standard deviations, intraclass correlations, and zero-order correlations for our study variables. All eight items assessing lack of detachment from work and all 12 items assessing job-related cognitions are displayed in the [Supporting Information](#).

To temporally separate the assessments of lack of after-work psychological detachment from work and evening job-related cognitions, we measured lack of psychological detachment in the evening survey on day *d* and job-related cognitions referring to the previous evening in the morning survey on day *d* + 1. In the morning survey on day *d* + 1, we also assessed morning negative and positive affect. Finally, we assessed end-of-work negative and positive affect in the end-of-work survey on day *d* + 1, along with negative and positive work events on day *d* + 1.

6.3.1 | Personality traits (assessed in the entrance survey)

We assessed neuroticism and extraversion with six items each from the German short version (Körner et al., 2008) of the NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992) that correlates highly with the NEO-FFI long version (Körner et al., 2008). Both scales showed good reliability in the present data set, with Cronbach's $\alpha = .88$ and $.75$ for neuroticism and extraversion, respectively.

6.3.2 | Lack of psychological detachment from work (assessed in evening survey on day *d*)

To assess lack of after-work psychological detachment from negative work events and lack of after-work psychological detachment from positive work events, we adjusted items from Sonnentag and Fritz (2007). Specifically, we added references to positive versus negative aspects to the original items (sample items: "After work today, I forgot about negative events of the working day," "After work today, I forgot about positive events of the working day"). Similar to Lu et al. (2022), we reverse-coded the item scores to capture lack of psychological detachment from negative (within-person $\omega = .81$, between-person = $.98$) and positive events (within-person $\omega = .75$, between-person = $.95$) with four items each.

TABLE 1 Means, standard deviations, intraclass correlations, and zero-order correlations between study variables.

Variables	M	SD b	SD w	ICC	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Neuroticism	2.15	0.90	-	-	-.30	.01	.00	-.34	-.04	.43	.36	.12	.13	-.40	.55	-.29	.18	-.35	.56
2. Extraversion	3.12	0.68	-	-	-	-.04	.00	.17	-.05	-.13	-.10	.15	.13	.36	-.20	.09	-.06	.38	-.21
3. Day of data collection	4.82	0.74	2.72	.000			.43	.05	.17	-.04	-.04	-.10	-.11	.06	-.04	-.16	.05	-.04	.01
4. Weekday ^a	1.51	0.35	1.10	.000	-	.37		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5. Lack of detachment from negative events	2.30	0.86	1.16	.447	-	-.01	-.01		.64	.78	.70	.38	.35	-.22	.50	-.15	.50	-.32	.53
6. Lack of detachment from positive events	2.46	0.85	1.14	.485	-	.10	.08	.32		.36	.41	.65	.52	.08	.13	.15	.18	-.00	.08
7. NEGRUM	1.60	0.65	0.92	.411	-	.01	-.01	.42	.06		.91	.49	.48	-.15	.67	-.20	.55	-.20	.70
8. SOLSEEK	1.68	0.68	0.91	.475	-	-.04	-.03	.35	.13	.72		.62	.65	-.05	.57	-.03	.50	-.09	.56
9. POSRUM	1.77	0.65	0.91	.419	-	-.08	-.04	-.01	.34	.09	.21		.93	.27	.30	.31	.29	.25	.24
10. GOALGEN	1.65	0.68	0.89	.504	-	-.08	-.05	.04	.29	.14	.29	.71		.26	.31	.32	.23	.23	.27
11. Morning PA	2.78	0.67	0.83	.606	-	.03	.05	-.07	-.01	-.04	-.01	.09	.08		-.20	.31	-.02	.81	-.21
12. Morning NA	1.43	0.48	0.59	.575	-	.01	-.02	.13	-.01	.31	.18	-.03	-.02	-.08		-.29	.32	-.23	.96
13. Positive events	0.58	0.24	0.35	.353	-	-.05	-.06	.04	.05	-.02	.01	-.01	-.02	.09	.00		.02	.37	-.32
14. Negative events	0.13	0.14	0.21	.275	-	.01	-.03	-.02	.04	.06	.05	.04	.03	.00	.09	-.18		-.01	.39
15. Afternoon PA	3.05	0.63	0.80	.522	-	-.01	.06	-.00	-.03	.00	.01	-.02	-.01	.24	-.06	.27	-.16		-.25
16. Afternoon NA	1.51	0.52	0.69	.507	-	.03	-.05	.04	.03	.09	.04	.03	.03	.01	.23	-.18	.35	-.20	

Note: Correlations above the diagonal are person-level correlations, and correlations below the diagonal are day-level correlations. Person-level sample size varies between 234 and 243, day-level sample size varies between 1304 and 1699. Person-level correlations $\geq |.13|$ are significant with $p < .05$ and $\geq |.17|$ are significant with $p < .01$. Day-level correlations $\geq |.06|$ are significant with $p < .05$ and $\geq |.08|$ are significant with $p < .01$.

SD b = standard deviation between persons. SD w = standard deviation within persons. ICC = intraclass correlation.

Abbreviations: GOALGEN, forward-oriented goal generation; NA, negative affect; NEGRUM, backward-oriented negative rumination; PA, positive affect; POSRUM, backward-oriented positive rumination; SOLSEEK, forward-oriented solution seeking.

^aWeekday ranged from 0 = Tuesday to 3 = Friday.

6.3.3 | Evening job-related cognitions (assessed in morning survey on day $d + 1$)

Following study protocols used in earlier research that assessed evening experiences (Chawla et al., 2020; Lanaj et al., 2014), we measured evening job-related cognitions in the morning survey. This approach allowed us to also capture very late job-related cognitions (e.g., immediately before falling asleep) that would have been missed in an evening assessment and, at the same time, prevented the possibility that answering job-cognition items late in the evening impairs sleep. To assess job-related cognitions, we first asked participants to recall yesterday's workday and "report one to two positive events that occurred yesterday at work" and to "report one to two negative events that occurred yesterday at work," with a daily randomized order of asking about positive versus negative events. Typical responses included "problems were resolved quickly," "pleasant call with a client" for positive events and "high workload, little time," "being criticized in front of the team" for negative events. After having recalled events, participants responded to a total of 12 items assessing backward-oriented and forward-oriented job-related cognitions, again with positive and negative items presented in a random order. Specifically, we assessed backward-oriented negative rumination (sample item: "Yesterday evening, I could not stop thinking about negative things that happened at work yesterday"; within-person $\omega = .89$, between-person $\omega = .99$) and backward-oriented positive rumination (sample item: "Yesterday evening, I repeatedly thought about a positive event from yesterday's workday about which I am glad"; within-person $\omega = .85$, between-person $\omega = .98$) with three items each. Similarly, we used three items each to assess forward-oriented solution seeking (sample item: "Yesterday evening, I considered what steps I can take to improve negative things at work"; within-person $\omega = .81$, between-person $\omega = .99$) and forward-oriented goal generation (sample item: "Yesterday evening, I realized what needs to be done after I have achieved a positive interim outcome yesterday at work"; within-person $\omega = .82$, between-person $\omega = .99$).

To examine the construct validity of these cognition measures, we performed a two-level confirmatory factor analysis in Mplus 7.4, using person-mean centered item scores (cf. Geldhof et al., 2014, Footnote 4) to model four factors at the within-person level, with all items loading on their respective factors. Excellent model fit demonstrates that the four measures represent four distinct constructs, $\chi^2 = 62.158$, $df = 68$, CFI = 0.997, TLI = 0.996, RMSEA = 0.013. As shown in Table S2, model fit of alternative models was significantly worse.²

²Also when modeling the four-factor structure at the within-person and between-person level with the lavaan package (0.6-5; Rosseel, 2012) in R, model fit was excellent, $\chi^2 = 114.578$, $df = 96$, CFI = 0.998, TLI = 0.997, RMSEA = 0.011 (Table S3). An additional set of confirmatory factors analyses that aimed at differentiating between lack-of-detachment measures and job-related cognition measures showed that a model that specifies the six variables as distinct constructs fit the data best, both when using a within-person model and when using a within-person and between-person model (Tables S4 and S5).

6.3.4 | Morning affect (assessed in morning survey on day $d + 1$)

In the morning survey, we assessed activated negative and activated positive affect with items from the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) in its German version (Krohne et al., 1996). Participants reported how they felt "right now" with respect to a total of 12 items (sample item for negative affect: "distressed"; sample items for positive affect: "excited"), using 5-point Likert scales ranging from 1 = *not at all* to 5 = *intensely*. For negative affect, within-person ω was .75 and between-person ω was .96. For positive affect, within-person ω was .81 and between-person ω was .95.

6.3.5 | End-of-work affect (assessed in end-of-work survey on day $d + 1$)

To assess activated negative and activated positive affect in the end-of-work survey, we administered the same items with the same response format as used in the morning survey. For negative affect, within-person ω was .82 and between-person ω was .95. For positive affect, within-person ω was .80 and between-person ω was .93.

6.3.6 | Control variables

We included several control variables in our analysis.³ First, to take into account potential day-of-the-week effects and potential measurement reactivity, we controlled for day of the week and day of data collection, respectively.⁴ Second, to be able to attribute end-of-work affect to morning affect, we controlled for negative and positive events happening during the workday. Specifically, drawing on Koopmann et al.'s (2016) approach, in the end-of-work survey we provided study participants with a list of five negative events (sample item: "I received negative feedback, criticism, or complaints") and four positive events (sample item: "I accomplished what I had hoped to") and asked whether each event had happened during the workday. As variables to be used in the analyses, we computed the number of negative events and the number of positive events that happened during the day. Because single events do not represent one underlying construct and in line with earlier research (Bono et al., 2013; Koopmann et al., 2016), we did not compute reliability scores.

6.3.7 | Overall construct validity

In addition to the CFA reported above, we performed a set of two-level CFAs in which we included all study variables. We modeled two between-person factors (neuroticism and extraversion, six items each)

³When testing a model without any control variables, findings did not change.

⁴When additionally controlling for sine and cosine of weekday and sine and cosine of day of data collection, findings did not change.

and 12 within-person factors, using person-mean centered item scores of the day-level measures of lack of detachment from negative events (four items), lack of detachment from positive events (four items), job-related cognitions (total of 12 items, four constructs), morning negative affect (six items), morning positive affect (six items), end-of-work negative affect (six items), end-of-work positive affect (six items), negative events (five items), and positive events (four items). All items loaded on their respective constructs. Model fit was satisfactory, $\chi^2 = 2970.834$, $df = 1312$, $CFI = 0.918$, $TLI = 0.910$, $RMSEA = 0.027$, and significantly better than the model fit of alternative models (Table S6).

6.4 | Data analysis

To take the multilevel structure of our data into account (i.e., days nested within persons) and to make optimal use of the available data (Newman, 2014), we analyzed two-level path models with Blimp 3.0.63, using model-based imputation of missing data with Bayesian estimation (Enders et al., 2020). Blimp is a multipurpose data-analysis program suitable to analyze multilevel data with multiple mediators and multiple outcomes. It uses Bayesian estimation and fully conditional specification to impute missing values (Keller & Enders, 2022). We chose the Bayesian approach to test our hypotheses as this approach is suitable for estimating complex models (Zyphur & Oswald, 2015), particularly when models incorporate multilevel mediation (Yuan & MacKinnon, 2009). In our analysis, we relied on noninformative prior distributions. Data from Monday mornings that were omitted from the data set (see Section 6.1) were not imputed because this missingness was not at random. Percentage of missing data ranged from 0% (measures of job-related cognitions) to 12.18% (lack-of-detachment measures).

Because Hypotheses 1 to 6 focused on day-level processes, we modeled the paths referring to these hypotheses at Level 1 only, using person-mean centered scores for predictors, mediators, and control variables. We modeled all within-person paths that referred to hypotheses tests as random. To limit the number of parameters to be estimated, we modeled paths including the control variables as fixed. We tested indirect effects with the product of coefficient approach (MacKinnon et al., 2002). Obviously, cross-level moderator effects of neuroticism and extraversion, along with the main effects of neuroticism and extraversion, were specified at Level 2.

7 | RESULTS

7.1 | Tests of hypotheses

Tables 2 and 3 show the results of the multilevel path analysis. In Hypothesis 1, we proposed that lack of detachment from negative events would be positively related to backward-oriented negative rumination and forward-oriented solution seeking during the evening. Table 2 shows that lack of detachment from negative events

was positively related to backward-oriented negative rumination, $\gamma = .34$, 95% CI [0.26, 0.42], and forward-oriented solution seeking, $\gamma = .28$, 95% CI [0.20, 0.35], providing support for Hypothesis 1. Also, lack of detachment from positive events was positively related to forward-oriented solution seeking, $\gamma = .08$, 95% CI [0.02, 0.15].⁵

Hypothesis 2 proposed that lack of detachment from positive events is positively related to backward-oriented positive rumination cognitions and forward-oriented goal generation during the evening. Analysis revealed that lack of detachment from positive events was positively related to backward-oriented positive rumination, $\gamma = .35$, 95% CI [0.27, 0.43], and forward-oriented goal generation, $\gamma = .27$, 95% CI [0.21, 0.34], providing support for Hypothesis 2.

Hypothesis 3 addressed backward-oriented negative rumination and forward-oriented solution seeking as predictors of morning negative affect. As shown in Table 3, backward-oriented negative rumination was positively related to morning negative affect, $\gamma = .16$, 95% CI [0.10, 0.22], but forward-oriented solution seeking was not, $\gamma = -.05$, 95% CI [−0.11, 0.01]. The relationship between backward-oriented negative rumination and morning negative affect differed significantly from the relationship between forward-oriented solution seeking and morning negative affect, estimate = 0.21, 95% CI [0.10, 0.31]. Thus, data were in line with Hypotheses 3a and 3c, but not with Hypothesis 3b.

Hypothesis 4 focused on serial indirect effects from lack of detachment from negative events to end-of-work negative affect. As shown in Table 3, morning negative affect was positively related to end-of-work negative affect, $\gamma = .18$, 95% CI [0.03, 0.30]. The serial indirect effect of lack of detachment from negative events on end-of-work negative affect via backward-oriented negative rumination and morning negative affect was significant, estimate = 0.009, 95% CI [0.003, 0.019],⁶ but the serial indirect effect via forward-oriented solution seeking and negative affect was not, estimate = −0.002, 95% CI [−0.007, 0.000].⁷ The indirect negative relationship between lack of detachment from negative events and end-of-work negative affect via backward-oriented negative rumination and morning negative affect was stronger than the indirect negative relationship via forward-oriented solution seeking and morning negative affect,

⁵When directly comparing the predictive power of lack of detachment from negative events with the predictive power of lack of detachment from positive events, we found that compared with lack of detachment from positive events, lack of detachment from negative events was a stronger predictor for forward-oriented solution seeking, estimate = 0.20, 95% CI [0.09, 0.30] and also for backward-oriented negative rumination, estimate = 0.34, 95% CI [0.21, 0.44], and a weaker predictor for backward-oriented positive rumination, estimate = −0.38, 95% CI [−0.50, −0.26], and forward-oriented goal generation, estimate = −0.26, 95% CI [−0.36, −0.15].

⁶When running a model in which we omitted the path from morning negative affect to end-of-work negative affect, backward-oriented negative rumination did not predict end-of-work negative affect, demonstrating that backward-oriented negative rumination relates to end-of-work negative affect only via morning negative affect.

⁷When analyzing a model with only forward-oriented solution seeking as predictor of morning and end-of-work negative and positive affect (i.e., when omitting the other three cognition variables from the model), forward-oriented solution seeking was a significant predictor of morning negative affect, $\gamma = .07$, 95% CI [0.02, 0.12]. The serial indirect effect from lack of detachment from negative aspects of one's work to end-of-work negative affect via forward-oriented solution seeking and morning negative affect was significant, estimate = 0.003, 95% CI [0.001, 0.007].

TABLE 2 Unstandardized coefficients from multilevel modeling predicting job-related cognitions.

Predictors	Backward-oriented negative rumination (NEGRUM)			Forward-oriented solution seeking (SOLSEEK)			Backward-oriented positive rumination (POSRRUM)			Forward-oriented goal generation (GOALGEN)		
	Estimate	SD	95% CI	Estimate	SD	95% CI	Estimate	SD	95% CI	Estimate	SD	95% CI
Intercept	1.56	0.05	[1.47, 1.65]	1.70	0.05	[1.61, 1.79]	1.80	0.05	[1.67, 1.84]	1.69	0.05	[1.60, 1.79]
Level-2 predictors												
Neuroticism (NEU)	0.23	0.04	[0.16, 0.29]	0.20	0.04	[0.12, 0.27]	0.08	0.04	[−0.00, 0.16]	0.08	0.04	[0.01, 0.17]
Extraversion (EX)	0.03	0.04	[−0.04, 0.11]	0.03	0.05	[−0.06, 0.11]	0.14	0.06	[0.03, 0.25]	0.15	0.06	[0.05, 0.27]
Level-1 predictors												
Day of data collection	−0.00	0.01	[−0.01, 0.01]	−0.02	0.01	[−0.03, −0.00]	−0.02	0.01	[−0.03, 0.00]	−0.02	0.01	[−0.03, −0.01]
Weekday ^a	−0.00	0.02	[−0.03, 0.03]	0.01	0.02	[−0.03, 0.03]	−0.01	0.02	[−0.03, 0.04]	0.01	0.01	[−0.02, 0.04]
DETNEG	0.34	0.04	[0.26, 0.42]	0.28	0.04	[0.20, 0.35]	−0.03	0.04	[−0.10, 0.04]	0.02	0.03	[−0.04, 0.08]
DETPOS	0.02	0.04	[−0.05, 0.09]	0.08	0.03	[0.02, 0.15]	0.35	0.04	[0.27, 0.43]	0.27	0.04	[0.21, 0.34]
Cross-level moderators												
DETNEG × NEU	0.11	0.03	[0.05, 0.18]	0.07	0.03	[0.00, 0.13]	0.03	0.03	[−0.02, 0.08]	0.05	0.03	[−0.00, 0.11]
DETPOS × EX	0.03	0.03	[−0.03, 0.10]	0.05	0.03	[−0.02, 0.11]	0.06	0.03	[0.00, 0.11]	0.10	0.04	[0.03, 0.17]
Residual variance	0.34	0.02	[0.31, 0.37]	0.32	0.01	[0.29, 0.34]	0.35	0.02	[0.32, 0.38]	0.30	0.01	[0.28, 0.33]
Variance explained	23.5%			18.1%			14.0%			11.9%		

Note: Sample size: 1699 days from 243 persons. Estimates are unstandardized, resulting from one overall analysis predicting both job-related cognitions (Table 2) and morning and end-of-work affect (Table 3). DETNEG = Detachment from negative events. DETPOS = Detachment from positive events. CI = Credible interval.

^aWeekday (ranging from 0 = Tuesday to 3 = Friday) was modeled as a predictor for detachment from negative events and detachment from positive events as well.

TABLE 3 Unstandardized coefficients from multilevel modeling predicting morning and end-of-work affect.

Predictors	Morning negative affect			Morning positive affect			End-of-work negative affect			End-of-work positive affect		
	Estimate	SD	95% CI	Estimate	SD	95% CI	Estimate	SD	95% CI	Estimate	SD	95% CI
Intercept	1.39	0.03	[1.33, 1.46]	2.72	0.05	[2.62, 2.82]	1.44	0.04	[1.39, 1.53]	3.02	0.05	[2.92, 3.12]
Level-2 predictors												
Neuroticism (NEU)	-	-	-	-	-	-	-	-	-	-	-	-
Extraversion (EX)	-	-	-	-	-	-	-	-	-	-	-	-
Level-1 predictors												
Day of data collection	0.00	0.00	[-0.00, 0.01]	0.01	0.01	[-0.00, 0.02]	0.01	0.01	[-0.00, 0.02]	-0.03	0.02	[-0.07, 0.00]
Weekday ^a	-0.00	0.01	[-0.02, 0.01]	0.01	0.01	[-0.01, 0.04]	-0.02	0.01	[-0.05, -0.00]	0.05	0.02	[0.01, 0.09]
DETNEG	0.03	0.02	[-0.01, 0.08]	-0.05	0.03	[-0.09, 0.00]	0.05	0.03	[-0.01, 0.10]	-0.00	0.03	[-0.06, 0.06]
DETPOS	-0.02	0.02	[-0.07, 0.02]	-0.01	0.02	[-0.05, 0.04]	-0.00	0.02	[-0.05, 0.05]	-0.01	0.03	[-0.07, 0.04]
NEGRUM	0.16	0.03	[0.10, 0.22]	-0.04	0.04	[-0.11, 0.03]	0.02	0.04	[-0.06, 0.10]	-0.02	0.04	[-0.10, 0.06]
SOLSEEK	-0.05	0.03	[-0.11, 0.01]	0.01	0.04	[-0.06, 0.09]	-0.03	0.04	[-0.10, 0.04]	0.05	0.04	[-0.04, 0.13]
POSNUM	-0.01	0.02	[-0.05, 0.04]	0.06	0.04	[-0.01, 0.12]	0.00	0.03	[-0.06, 0.06]	-0.03	0.04	[-0.11, 0.05]
GOALGEN	-0.01	0.03	[-0.06, 0.04]	0.05	0.04	[-0.02, 0.13]	0.04	0.04	[-0.03, 0.12]	-0.04	0.05	[-0.12, 0.06]
Positive events	-	-	-	-	-	-	-0.15	0.05	[-0.25, -0.05]	0.39	0.07	[0.26, 0.52]
Negative events	-	-	-	-	-	-	0.73	0.11	[0.53, 0.94]	-0.37	0.11	[-0.60, -0.15]
Morning PA	-	-	-	-	-	-	0.01	0.03	[-0.04, 0.06]	0.23	0.04	[0.16, 0.31]
Morning NA	-	-	-	-	-	-	0.18	0.06	[0.03, 0.30]	-0.06	0.06	[-0.17, 0.05]
Cross-level moderators												
DETNEG × NEU	-	-	-	-	-	-	-	-	-	-	-	-
DETPOS × EX	-	-	-	-	-	-	-	-	-	-	-	-
Residual variance	0.10	0.00	[0.09, 0.10]	0.23	0.01	[0.21, 0.25]	0.11	0.01	[0.10, 0.12]	0.18	0.01	[0.16, 0.21]
Variance explained	4.2%			1.2%			7.3%			6.0%		

Note: Sample size: 1699 days from 243 persons. Estimates are unstandardized, resulting from one overall analysis predicting both job-related cognitions (Table 2) and morning and end-of-work affect (Table 3). Abbreviations: CI, credible interval; DETNEG, detachment from negative events; DETPOS, detachment from positive events; GOALGEN, forward-oriented goal generation; NA, negative affect; NEGRUM, backward-oriented negative rumination; PA, positive affect; POSRUM, backward-oriented positive rumination; SOLSEEK, forward-oriented solution seeking.

^aWeekday (ranging from 0 = Tuesday to 3 = Friday) was modeled as a predictor for detachment from negative events and detachment from positive events as well.

estimate = 0.011, 95% CI [0.003, 0.025]. Thus, Hypotheses 4a and 4c were supported, but Hypothesis 4b was not.

Hypothesis 5 referred to backward-oriented positive rumination and forward-oriented goal generation during the evening as predictors of morning positive affect. Analysis showed that neither backward-oriented positive rumination, $\gamma = .06$, 95% CI [−0.01, 0.12], nor forward-oriented goal generation, $\gamma = .05$, 95% CI [−0.02, 0.13], were related to morning positive affect.⁸ The relationship between backward-oriented positive rumination and morning positive affect did not differ from the relationship between forward-oriented goal generation and morning positive affect, estimate = 0.003, 95% CI [−0.134, 0.132]. Thus, the data do not support Hypothesis 5.

Hypothesis 6 stated serial indirect effects from lack of detachment from positive events to end-of-work positive affect. Morning positive affect was positively related to end-of-work positive affect, $\gamma = .23$, 95% CI [0.16, 0.31] (Table 3). However, neither the serial indirect effect of backward-oriented positive rumination, estimate = 0.004, 95% CI [−0.001, 0.011], nor the serial indirect effect of forward-oriented goal generation, estimate = 0.003, 95% CI [−0.003, 0.009], on end-of-work positive affect via morning positive affect were significant. The difference between these two nonsignificant indirect effects was not significant, estimate = 0.001, 95% CI [−0.009, 0.011]. Thus, Hypothesis 6 was not supported.

Hypothesis 7 stated that neuroticism influences the relationships between lack of detachment from negative events on the one hand and backward-oriented negative rumination and forward-oriented solution seeking on the other hand. As shown in Table 2, neuroticism moderated the relationship between lack of detachment from negative events and backward-oriented negative rumination, estimate = 0.11, 95% CI [0.05, 0.18]. Simple slope analysis revealed that when neuroticism was high (+1 SD), the negative relationship between lack of detachment from negative events and backward-oriented negative rumination, estimate = 0.45, 95% CI [0.34, 0.54], was stronger than when neuroticism was low (−1 SD), estimate = 0.24, 95% CI [0.14, 0.34], panel a in Figure 2. Neuroticism also moderated the relationship between lack of detachment from negative events and forward-oriented solution seeking, estimate = 0.07, 95% CI [0.00, 0.13]. When neuroticism was high (+1 SD), the negative relationship between lack of detachment from negative events and forward-oriented solution seeking, estimate = 0.34, 95% CI [0.24, 0.43], was stronger than when neuroticism was low (−1 SD), estimate = 0.22, 95% CI [0.13, 0.31], panel b in Figure 2. Thus,

Hypotheses 7a and 7b were supported. Standardized effect sizes, however, were small, standardized estimate = 0.108, 95% CI [0.054, 0.164] for backward-oriented negative rumination, and standardized estimate = 0.076, 95% CI [0.004, 0.144] for forward-oriented solution seeking.⁹

Going beyond our hypothesis tests, we examined if the serial indirect effects of lack of detachment from negative events on end-of-work negative affect, via backward-oriented negative rumination and morning negative affect, differed between high versus low levels of neuroticism. Indeed, the negative indirect effect of lack of detachment from negative events on end-of-work negative affect was stronger for high neuroticism (+1 SD), estimate = 0.012, 95% CI [0.004, 0.025], than for low neuroticism (−1 SD), estimate = 0.006, 95% CI [0.002, 0.014], with a significant difference between the indirect effects, estimate = 0.005, 95% CI [0.001, 0.013].

Hypothesis 8 proposed that extraversion influences the relationships between lack of detachment from positive events and backward-oriented positive rumination as well as forward-oriented goal generation. Extraversion moderated both relationships (Table 2), estimate = 0.06, 95% CI [0.00, 0.11], and estimate = 0.10, 95% CI [0.03, 0.17], respectively. Simple slope analysis showed that the positive relationship between lack of detachment from positive events and backward-oriented positive rumination was stronger when extraversion was high (+1 SD), estimate = 0.41, 95% CI [0.31, 0.50], than when it was low (−1 SD), estimate = 0.30, 95% CI [0.20, 0.39], panel c in Figure 2. Similarly, the positive relationship between lack of detachment from positive events and forward-oriented goal generation was stronger when extraversion was high (+1 SD), estimate = 0.34, 95% CI [0.26, 0.43], than when it was low (−1 SD), estimate = 0.21, 95% CI [0.12, 0.29], panel d in Figure 2. Thus, data were in line with Hypotheses 8a and 8b. Standardized effect sizes were very small, standardized estimate = 0.057, 95% CI [0.005, 0.108] for backward-oriented positive rumination, and standardized estimate = 0.088, 95% CI [0.026, 0.149] for forward-oriented goal generation.¹⁰

7.2 | Additional analysis

We argued that lack of psychological detachment from work is related to subsequent affect via specific job-related cognitions during the evening. As our data are correlational, it might be that prior affect had an impact on lack of detachment, job-related cognitions, and next-day

⁸When testing two additional models with only backward-oriented positive rumination and forward-oriented goal generation, respectively, as single predictors of morning and end-of-work negative and positive affect, backward-oriented positive rumination positively predicted morning positive affect, $\gamma = .08$, 95% CI [0.03, 0.13], and was indirectly related to end-of-work positive affect via morning positive affect, estimate = 0.018, 95% CI [0.007, 0.033]. The serial indirect effect from lack of detachment from positive aspects of one's work to end-of-work positive affect via backward-oriented positive rumination and morning positive affect was significant, estimate = 0.006, 95% CI [0.002, 0.011]. Similarly, forward-oriented goal generation positively predicted morning positive affect, $\gamma = .09$, 95% CI [0.04, 0.14], and was indirectly related to end-of-work positive affect via morning positive affect, estimate = 0.020, 95% CI [0.008, 0.035]. The serial indirect effect from lack of detachment from positive aspects of one's work to end-of-work positive affect via forward-oriented goal generation and morning positive affect was significant, estimate = 0.005, 95% CI [0.002, 0.009].

⁹We conducted post-hoc power analyses for the cross-level interaction effects based on standardized input information, using the SIMR package in R (Green & MacLeod, 2016), as recommended by Arend and Schäfer (2019). Because the standardized point estimates for the cross-level interaction effects were (very) small, statistical power for the cross-level interaction effects was small, with power estimates of 0.205 and 0.118, respectively. To help readers to plan future studies with similar cross-level interaction effects of personality, we provide results from power simulations in Table S10. The simulations demonstrate that power for standardized effect sizes below 0.100 is generally low, and also for standardized effect sizes around 0.100, power remains low until one reaches an unrealistically large sample size.

¹⁰As a consequence, post-hoc power computed with SIMR (Green & MacLeod, 2016) was low, with power estimates of 0.074 and 0.121, respectively.

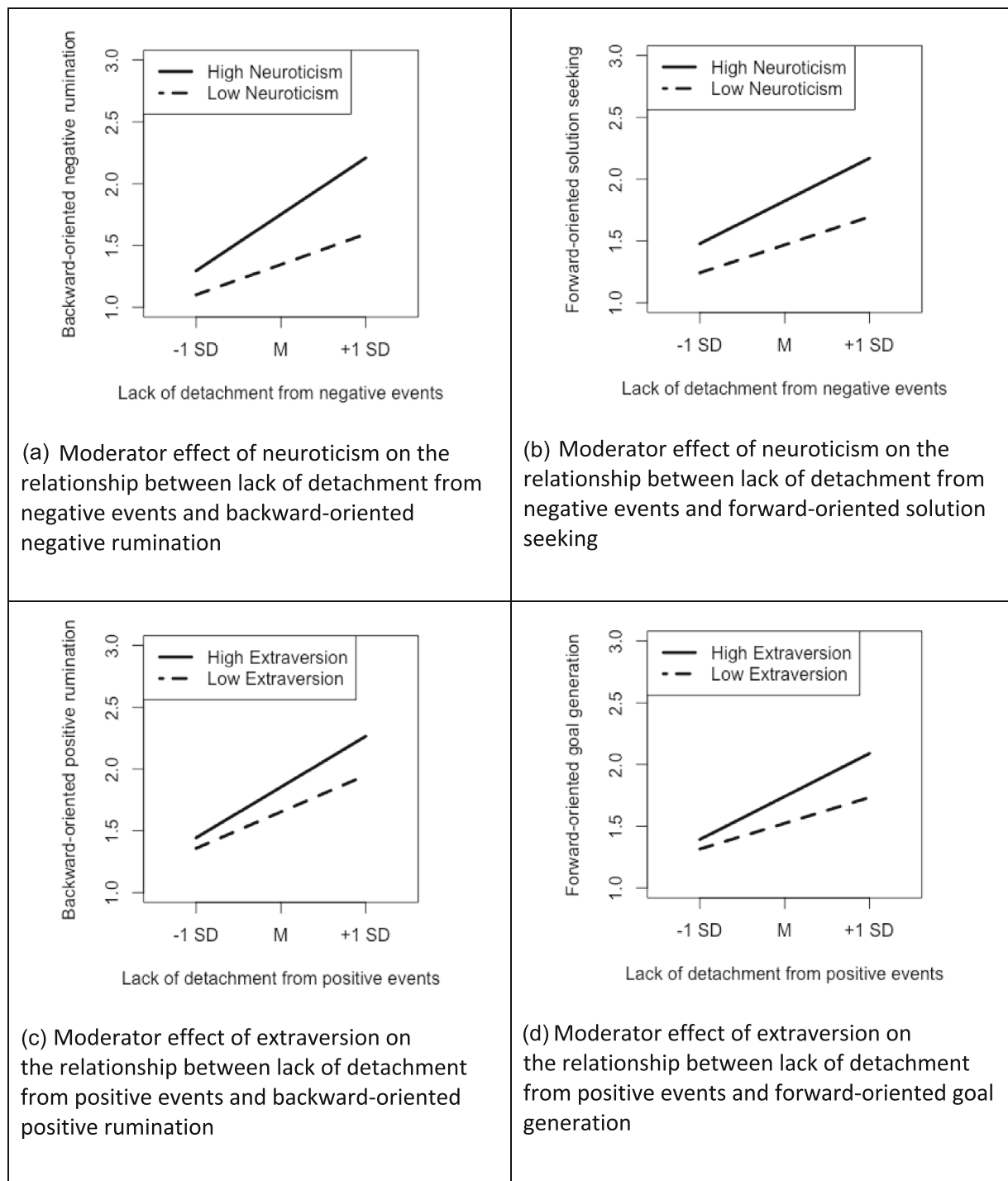


FIGURE 2 Moderator effects of neuroticism and extraversion.

effect, rendering the empirical associations between our core study variables spurious. To rule out this possibility, in an additional analysis, we controlled for end-of-work negative and positive affect on the previous day. In detail, we specified paths from person-mean centered previous-day end-of-work affect on lack of detachment, job-related cognitions, next-day morning affect, next-day work events, and next-day end-of-work affect. As Tables S7 to S9 show, end-of-work affect on the previous day indeed predicted lack of

detachment from work, job-related cognitions, morning affect, and work events, mostly in a valence-congruent way. Importantly, however, findings from our main analyses did not change, with one exception: The interaction effect between neuroticism and lack of detachment from negative events on forward-oriented solution seeking became nonsignificant. Despite this nonsignificant interaction effect, overall, the additional analysis suggests that prior affect cannot explain our core study findings.

8 | DISCUSSION

Our study examined the cognitive mechanisms that translate lack of detachment from work into unfavorable affective states the next day. Building on control theory, we found that lack of detachment from negative and positive events predicted job-related backward- and forward-oriented cognitions during the evening in a valence-congruent manner. Backward-oriented negative rumination during the evening was positively related to morning negative affect and showed an indirect positive effect with end-of-work negative affect via morning negative affect. However, none of the other types of job-related cognitions was related to subsequent affect. The relationships between detachment from negative events and backward-oriented negative rumination as well as forward-oriented solution seeking were stronger for persons high on neuroticism, whereas the relationships between lack of detachment from positive events and backward-oriented positive rumination as well as forward-oriented goal generation were stronger for persons high on extraversion.

8.1 | Theoretical implications

Our study brings the recovery literature to a better understanding of the mechanisms that link lack of psychological detachment from work to impaired well-being. We found that on days when employees do not detach from work at the end of the workday, they have more job-related cognitions later during the evening. Maybe unsurprisingly, lack of detachment from negative events mainly predicted negative cognitions and lack of detachment from positive events mainly predicted positive cognitions. Interestingly, however, lack of detachment from positive events also predicted cognitions about how to overcome a negative situation (i.e., forward-oriented solution seeking). It seems that the mental activation of more positive content caused by a lack of detachment from positive events infused a more positive outlook on an initially negative situation and therefore fostered thoughts about how to overcome such a situation. Thus, not detaching from positive events might help to see a negative situation in a more positive light.

Previous research on job-related cognitions and rumination during leisure time has either differentiated between negative versus positive valence (Meier et al., 2016) or between various rumination modes (Querstret & Cropley, 2012). In our study, we integrated the valence perspective with a temporal-direction perspective and found that four types of job-related cognitions can be clearly differentiated. This differentiation allowed us to examine in more detail the type of job-related cognition that is most harmful for next-day affect. Only backward-oriented negative rumination was related to morning and end-of-work negative affect and served as the linking mechanism between lack of detachment and next-day affect. This finding suggests that lack of detachment from work exerts its influence on unfavorable affective states by eliciting negative thoughts that center around what has happened and that keep the person mentally trapped in the past. When testing the four cognition types in separate models

(see Footnotes 7 and 8), all were significant valence-congruent predictors of negative and positive affect, respectively, suggesting that all four cognition types play a role when examined in isolation. In the overall analyses with all four types of job-related cognitions, backward-oriented negative rumination outperformed the predictive power of the other job-related cognitions. It might be that this type of job-related cognition immediately increases negative affect (Huffziger et al., 2012) and narrows attention (Whitmer & Gotlib, 2013), which makes this type of thought particularly persistent and powerful, overriding the impact of the other types of job-related thoughts.

Interestingly, lack of detachment from negative events was an equally strong predictor for backward-oriented negative rumination and forward-oriented solution seeking. This is a noteworthy finding for control theory as cognitive attempts to reduce the discrepancy between a desired and the actual state (i.e., forward-oriented solution seeking) were not more likely than dwelling on the discrepancy (i.e., backward-oriented negative rumination). Thus, the principle of discrepancy reduction might be less prevalent in employees' daily life than originally stated within control theory (Carver & Scheier, 1998).

Our pattern of findings also implies that job-related cognitions that focus on positive content are rather ineffective in fostering positive affect when jointly examined with backward-oriented negative rumination. Of note, we assessed rather specific positive thought content that was rooted in the past workday. Previous studies that found that positively toned job-related cognitions predict next-day states used rather broad measures of job-related cognitions, referring to positive reflections about one's work in general (Meier et al., 2016; Sonnentag et al., 2021). Thus, broad measures of positive job-related cognitions might be more effective in predicting next-day positive states than more narrow measures.

Finally, our study showed that personality influences the strength of the relationship between lack of detachment and job-related cognitions, in addition to strong main effects of neuroticism and extraversion.¹¹ These findings suggest that personality influences the downstream consequences of lack of psychological detachment from work on negative affect. With these findings, our study adds to personality research within organizational behavior. It demonstrates that personality is not only important by influencing processes happening at work (Judge et al., 2002; Wilmot et al., 2019) but also by influencing processes happening off work when employees should recover and replenish their energetic and affective resources.

Although we uncovered significant moderator effects of neuroticism and extraversion, we need to note that the effect sizes were small. Main effects of the personality traits, particularly of neuroticism, were substantially larger. Thus, our findings are interesting in the light of trait-activation theory (Tett et al., 2021). This theory describes that specific traits become particularly relevant and exert their influence in specific situations, implying that neuroticism is

¹¹Standardized effect sizes of neuroticism's main effect on backward-oriented negative rumination and forward-oriented solution seeking were 0.233, 95% [0.165, 0.301] and 0.195, 95% [0.122, 0.269], respectively. Standardized effect sizes of extraversion's main effect on backward-oriented positive rumination and forward-oriented goal generation were 0.107, 95% [0.026, 0.187] and 0.122, 95% [0.036, 0.203], respectively.

activated in negative-event situations that potentially constitute a threat (DeYoung, 2015) and extraversion is activated in positive event-situations that incorporate opportunities for psychological rewards (DeYoung, 2015). The significant interaction effects partly reflect this trait-activation perspective, but the main effects suggest that neuroticism and extraversion are more powerful in directly shaping job-related cognitions.

8.2 | Limitations and directions for future research

As is the case with many daily-survey studies (Gabriel et al., 2019), we used self-report measures what might have caused common method bias (Podsakoff et al., 2003). We took countermeasures to minimize this bias. First, we implemented three measurement occasions per day so that we separated the assessment of most of the constructs and, thus, reduced the likelihood of inflated empirical relationships between variables. Second, we used different response formats for variables we assessed at the same point in time (job-related cognitions and morning affect). Third, we person-mean centered our day-level variables, removing all between-person variance from these variables. Thus, person-specific response tendencies that often contribute to inflated relationships between variables (Podsakoff et al., 2003) cannot explain the findings. Finally, we should note that most of our constructs refer to states and processes that can be best captured via self-report (i.e., cognitions, affects).

We assessed job-related cognitions retrospectively in the next morning, which might have resulted in some recall bias. With this deliberate choice, however, we followed other studies that used similar designs (Chawla et al., 2020; Lanaj et al., 2014). Importantly, we used morning assessments of job-related cognitions to temporally separate the assessment of these cognitions from the assessment of lack of detachment. Assessing both lack of detachment and job-related cognitions in the evening might have led to inflated relationships between the two sets of constructs. Moreover, evening assessments of job-related cognitions might have missed cognitions that occurred late in the evening, including cognitions occurring shortly before falling asleep. Finally, evening assessments might have even led to some measurement reactivity by triggering job-related cognitions.

As our data are correlational, strong conclusions about causality are not possible. The additional analysis, however, demonstrated that core findings remained robust when controlling for prior affect, that is, when taking into account that prior affect influenced some of the study variables. Of note, these additional findings suggest that affect, lack of detachment from work, and job-related cognitions during the evening might show a reciprocal relationship that potentially reinforce each other.

Our research points to additional avenues for future research. First, because our study focused on processes operating at the day level, it cannot speak to the potential longer term processes of reacting to lack of detachment with specific types of job-related cognitions. For instance, people who consistently respond to a lack of

detachment from negative events with negatively toned cognitions might experience a decline in job satisfaction over time, whereas people who only sporadically show this negative reaction might be able to uphold their job satisfaction. Moreover, although forward-oriented solution seeking and positively toned cognitions did not predict subsequent affect when examined in a joint model, these cognitions could have an impact over a longer period. Again, consistency of cognitions across time might play a role. Regular positively toned cognitions might result in higher job involvement, whereas sporadically occurring positively toned cognitions might not have this effect.

Second, it would be important to address the question of what can disrupt the process from backward-oriented negative rumination to morning negative affect. Research has shown that deliberate positive self-reflection and self-compassion exercises in the morning can set a positive tone for the upcoming workday (Lanaj et al., 2019; Schabram & Heng, 2022). Accordingly, it would be interesting to examine if these exercises are also effective in buffering the detrimental impact of evening negative job-related cognitions on next-morning negative affect.

Third, our study showed that neuroticism and extraversion influence job-related cognitions when not detaching from work. Future research might want to study the relevance of personality for other aspects of the recovery process. For instance, neuroticism and extraversion might play an even stronger role in the link between job events and lack of detachment and they might shape longer term reactions to lack of detachment from work on health and well-being. Future research may also examine other individual-difference variables as moderators in the relationship between lack of detachment and job-related cognitions. For instance, self-efficacy might be particularly relevant for engaging in forward-oriented versus backward-oriented thinking after not having detached from work.

Fourth, as we focused on affect as outcome of lack of detachment and job-related cognitions, it would be interesting to test in future research if particularly forward-oriented cognitions actually translate into any problem-solving or goal-generation behavior or even into proactive and creative behavior. Considering personality as a moderator, this might be particularly the case when employees have a highly proactive personality (Crant, 1995).

In addition, it would be interesting to examine which specific work events hinder versus help psychological detachment and subsequent job-related cognitions. According to control theory, events pointing to goal discrepancies versus goal attainment should be particularly relevant and construal level of the events could play a role as well (Watkins, 2008). With our rather general assessment of work events, we could not address the role of specific event features but encourage other researchers to do so.

Finally, our pattern of findings is important for research practice when addressing similar research questions. When testing the four types of job-related cognitions in separate models, all were significant predictors of negative and positive affect, respectively. In one overall model, however, only backward-oriented negative rumination predicted morning negative affect. These results highlight that studies including only positively framed variables, without also taking

negatively framed variables into account, might overestimate the role of positively framed variables. Similarly, in other cases, studies that include only negatively framed variables, while omitting positively framed ones, might result in similarly biased findings. Accordingly, our study showed that it is important to simultaneously take negatively framed and positively framed study constructs into account.

8.3 | Practical implications

Our research offers some practical implications. First and foremost, it is important to psychologically detach from negative work events at the end of the workday. Whereas the majority of past intervention studies focused on overall detachment from work (Karabinski et al., 2021), our study highlights the importance of detaching from the negative. For instance, this could be done through deliberate boundary management between work and nonwork life (e.g., by explicitly planning for leisure time; Haun et al., 2022). When it comes to positive events, full detachment is not desirable, and employees could benefit from deliberately recalling positive events and sharing them with others (Ilies et al., 2024; Smith et al., 2014).

Considering the detrimental impact of negative affect in organizational life (Matta et al., 2014), it is important to avoid negative rumination and to reduce the possibility that negative rumination translates into negative affect in the morning and throughout the workday. For instance, deliberate distraction and engagement in leisure activities that elicit positive affect may help to reduce the likelihood of backward-oriented negative rumination. In addition, daily routines and practices that set a positive tone for the day may be effective in overcoming the unfavorable impact of backward-oriented negative rumination.

9 | CONCLUSION

Overall, our study showed that lack of detachment from negative work events and lack of detachment from positive work events are associated with distinct job-related cognitions and that only backward-oriented negative rumination translates lack of detachment from negative events into next-day negative affect. This type of job-related cognition is particularly powerful in shaping subsequent negative affect. Neuroticism and extraversion play a role in the relationship between lack of detachment from work and job-related cognitions, with persons high on neuroticism showing the most adverse trajectory from lack of detachment from negative events to next-day negative affect.

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CONFLICT OF INTEREST STATEMENT

There is no conflict of interest.

DATA AVAILABILITY STATEMENT

Data will be available from the first author upon request.

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SUPPORTING INFORMATION

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

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