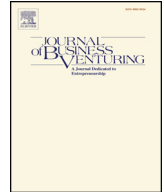




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Entrepreneurs' stressors and well-being: A recovery perspective and diary study

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ABSTRACT

Although entrepreneurs are said to have extremely stressful work, how they may be able to maintain their well-being in light of this is only poorly understood. Newly integrating the challenge-hindrance stressor framework with the stressor-detachment model of recovery from work stress, we investigate how specific challenge and hindrance stressors—cognitive and emotional demands—impact entrepreneurs' well-being by influencing their ability to detach and recover from work stress. Our diary study yielded 386 day-pair data points from 55 entrepreneurs. Challenge and hindrance stressors inhibited psychological detachment from work in the evening through increasing problem-solving pondering and work-related affective rumination, which diminished entrepreneurs' well-being the next morning. These effects are robust to alternative explanations (e.g., objectively measured sleep efficiency) and differ from relationships observed across entrepreneurs. Our findings elucidate the nature of stressors and the micro-foundational mechanisms of stress and recovery.

1. Executive summary

Elizabeth has led her software development firm for almost seven years. She loves challenging projects and the sense of achievement she feels after completing a project successfully, even if it involved much strenuous work. She enjoys the sense of progress and developing new programs and tools. On such days she feels energetic and vigorous. Yesterday, though, she faced an extra challenge at work: on top her usual busyness, something went wrong with the app she was developing for a local hospital. For the entire evening, including over dinner and when trying to fall asleep, she considered how to resolve the error. The following day, she woke up feeling dejected and in bad spirits. She remembers being in a similar state of mind about six weeks ago, on the day after an unpleasant salary negotiation with her new IT technologist. She kept worrying about that negotiation and whether she might lose the technologist throughout her son's school play that evening and late into the night.

Entrepreneurs' well-being is receiving increasing attention (Wiklund et al., 2019) because it is connected to a range of positive outcomes including firm performance (Stephan, 2018) and feeling successful (Wach et al., 2016). Yet, as the example of Elizabeth illustrates, the entrepreneurial work setting is complex, intense, uncertain, and stressful. *How can entrepreneurs maintain high well-being despite their stressful work?* To answer this question, entrepreneurship research needs deeper understanding of the nature of entrepreneurs' work stressors and the micro-foundational mechanisms of how such stressors affect their well-being.

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In this study, we account for the possibility that certain stressors have positive—challenging—effects (e.g., developing new programs) whereas others have negative—hindering—effects (e.g., conflict during salary negotiation) on entrepreneurs' well-being, as proposed in the challenge-hindrance stressor framework (LePine et al., 2005). Because entrepreneurs cannot easily distance themselves cognitively and emotionally from their firms, we investigate entrepreneurs' processes of detachment and recovery from their workday stressors to protect their well-being. To do so, we build on the stressor-detachment model (Sonnetag and Fritz, 2015).

We conduct a daily diary study and analyze data collected from 55 entrepreneurs over 12 days. We find that high cognitive demands are positively associated and high emotional demands negatively associated with entrepreneurs' well-being at the between-person level. In the short term, however, spikes of both types of work stressors (cognitive and emotional) during the workday impair entrepreneurs' recovery in the evening by making it difficult for them to detach from work and, in turn, feel energized and rested the next morning.

Our results highlight the need for more research into the diverse types of stressors in entrepreneurs' work and the central role of recovery for entrepreneurs' well-being. The challenge-hindrance stressor framework offers a springboard for such theorizing: it draws attention to stressors such as emotional demands that have been overlooked in entrepreneurship research, and enriches understanding of the seemingly paradoxical effects of cognitive demands. Our findings on the effects of stressors and detachment differ from those obtained using samples of employees. This suggests a need for more research to truly understand entrepreneurs' unique work situation and their well-being. Such research should account for different levels of analyses (within-person vs. between-person effects) and time perspectives (short-term processes from one day to the next vs. average effects over time).

As it may be difficult for entrepreneurs to reduce their stressors, devising recovery strategies that allow them to detach from work stressors in non-work time is especially important for maintaining well-being. We advise entrepreneurs to engage in absorbing recovery activities (e.g., physical exercise, meditation, socializing) that enable them to completely switch off after work. Moreover, those around entrepreneurs—investors, business partners, mentors, and coaches—should support entrepreneurs' efforts to look after their well-being and take time off work.

2. Introduction

“The reality is great highs, terrible lows and unrelenting stress. Don't think people want to hear about the last two.” (Elon Musk, tweeting in reply to a comment on his amazing life).

“All we need is the commitment to get enough sleep. Take time to recharge our mental and emotional batteries, put away our phones and laptops and tablets regularly, and try to introduce some stress-reduction tools into our lives.” (Arianna Huffington, after collapsing from exhaustion at her desk and breaking her cheek: *Financial Times*, 2014).

“Remember to make time for self-care. It's a vicious cycle: you're working so much that you forget to eat right or go to bed on time, so you wake up late, which puts you behind, so you work late again, and wake up at an even greater deficit. Soon, you're burned out and want to avoid working altogether.” (Aaron Orendorff, founder of iconiContent).

Interest in entrepreneurs' well-being is growing (Stephan, 2018; Wiklund et al., 2019). It is key to the very existence of their firms, increasing their opportunity recognition, persistence (Wincent et al., 2008), and firm performance (see Stephan's (2018) review). Entrepreneurs also view their well-being as indicative of their success (Wach et al., 2016). Given the importance of well-being, it seems imperative to understand how entrepreneurs achieve or maintain it, especially considering the high levels of work stressors they face.

Compared to paid employees, entrepreneurs' work is more challenging and complex and involves high levels of uncertainty, which make it extremely demanding and stressful (e.g., Cardon and Patel, 2015; Patzelt and Shepherd, 2011; Rauch et al., 2018). These demands are intensified by entrepreneurs' very direct connection to their work results, employees, and business. They have difficulty distancing themselves emotionally, cognitively, or indeed legally from their accountability. Entrepreneurs' work is mentally demanding: they must solve complex problems, act under time pressure, and switch between diverse tasks (Frese et al., 2000). Entrepreneurs' work can also be emotionally demanding and draining due to conflicts with customers, suppliers, or employees (Lechat and Torres, 2017; Schonfeld and Mazzola, 2015). Such stressors are common for exceptional wealth-creating entrepreneurs like Elon Musk and for “everyday” entrepreneurs (Aldrich and Ruef, 2018; Welter et al., 2017)—the many millions of owner-managers who run the small businesses forming the backbone of European and American economies (U.S. Small Business Administration, 2018; Eurostat, 2019) and who often seek a reasonable income to be able to afford a good life, rather than extraordinary growth and wealth (Stephan et al., 2015).

To understand entrepreneurs' stressors, past research has drawn on stressor-strain theories validated for employees (e.g., Kahn et al., 1964; Karasek, 1979), and proposed that all stressors negatively impact entrepreneurs' well-being (Stephan, 2018). Yet not all stressors appear to have such universally adverse effects on entrepreneurs. For instance, in a study across 15 European countries, Millán et al. (2011) find that long working hours actually positively affect job satisfaction (a form of work-related well-being). Moreover, entrepreneurs typically self-select into their stressful occupations and may even enjoy the challenge that certain work stressors pose (Baron et al., 2016). Such findings challenge the traditional view that all stressors impair well-being and suggest that our theoretical understanding of entrepreneurs' stress is underdeveloped.

One avenue to advance understanding of entrepreneurs' stress is to consider the nature of different stressor types. Work in psychology now refines traditional stressor-strain theories by distinguishing challenge and hindrance stressors (LePine et al., 2005). Challenge stressors, such as cognitive demands or time pressure, are work demands that entail the possibility of future gains and personal growth (Crawford et al., 2010). *By contrast, hindrance stressors, such as hassles, role conflict, or role ambiguity, are work demands that entail constraints and increase strain* (Crawford et al., 2010; LePine et al., 2004). *Whereas challenge stressors positively*

influence motivation, performance, and job satisfaction, hindrance stressors negatively affect these outcomes (e.g., Podsakoff et al., 2007).

The challenge-hindrance stressor framework (LePine et al., 2005) thus offers a new perspective to understand entrepreneurs' work stressors in a more nuanced and realistic manner. By integrating this framework into research on entrepreneurs' well-being, we can account for the possibility of certain stressors having ambivalent or even positive effects on entrepreneurs' well-being (Stephan, 2018) and entrepreneurial processes (Rauch et al., 2018).

Although research has started to document entrepreneurs' stressors (e.g., Stephan, 2018), understanding of the processes through which they impact entrepreneurs' well-being remains underdeveloped. We cannot simply generalize insights on stress processes from employees to entrepreneurs, as their work is uniquely demanding. Entrepreneurship researchers have begun to investigate long-term stress processes, and have linked entrepreneurs' chronic stressor exposure to physiological changes, specifically in allostatic load (Patel et al., 2019; Rauch et al., 2018; Stephan and Roesler, 2010). However, research has not yet theoretically and empirically examined the micro-foundations of how stress processes affect entrepreneurs in the short term (e.g., from one day to another). By understanding these micro-foundational stress processes, we could support entrepreneurs to better manage stress and maintain high well-being, despite their stressful work.

As two of the above quotes illustrate, some entrepreneurs see "taking time to recharge" as a way to deal with stressful work. We suggest that a key pathway of stressors' impact on entrepreneurs' well-being is through impairing detachment and recovery from work in non-work time; that is, high levels of stressors deny entrepreneurs their "time to recharge." Recovery is an important mechanism that helps individuals to stay engaged and healthy, despite extreme levels of work stressors, by allowing the body to "reset" and avoid physiological accumulation of stress (allostatic load; e.g., Sonnentag, 2018). One way to recover from work stress is by detaching mentally from work during non-work time, including not thinking about work in the evening (Sonnentag and Fritz, 2015).

In sum, current research offers limited understanding of the nature of stressors and of the processes through which they shape entrepreneurs' well-being. It is especially surprising how little we know about detachment and recovery processes,¹ considering that they likely play a critical role in maintaining entrepreneurs' well-being (Stephan, 2018).

We conduct a diary study to investigate how work stressors and detachment processes impact entrepreneurs' well-being. We analyze data collected from 55 entrepreneurs over 12 days, comprising 386 data points of lagged "day-pairs." In the evening after work on day *d*, we measure two types of workday stressors (cognitive and emotional demands) and two processes of impaired detachment (work-related problem-solving pondering and affective rumination). We test their effects on entrepreneurs' well-being measured the next morning (on day *d* + 1). We conduct multilevel analysis to distinguish day-level stress processes (within-person) and differences across entrepreneurs (between-person) (McCormick et al., 2018; Sonnentag and Lischetzke, 2018). The within-person effects relate daily fluctuations in work stressors to detachment in the evening and well-being the next morning (intraindividual process). The between-person effects can be seen as a proxy for average effects aggregated over time (McCormick et al., 2018), reflecting how differences in work stressors between entrepreneurs affect their well-being. Between-person effects are commonly theorized in the cross-sectional studies² that dominate research on entrepreneurs' well-being (Stephan, 2018).

Our study makes several contributions. First, we advance research on entrepreneurs' stress by introducing the challenge-hindrance stressor framework (LePine et al., 2005) to entrepreneurship research. This develops a new understanding of how and why different work stressors (challenge vs. hindrance stressors) influence entrepreneurs' well-being in opposing directions (positively and negatively, respectively, at the between-person level). Moreover, we illuminate how daily surpluses in challenge and hindrance stressors suppress entrepreneurs' well-being. Our findings open new avenues for research on entrepreneurs' stress and well-being. For instance, they draw attention to overlooked emotional stressors and identify other challenge stressors with potentially positive effects on entrepreneurs' well-being.

Second, we contribute to emerging research on the importance of recovery for entrepreneurs (e.g., Weinberger et al., 2018; Williamson et al., 2019) by studying how work stressors affect well-being from one day to another. We newly identify psychological detachment processes during non-work time in the evening as mechanisms that mediate work stressors' effect on entrepreneurs' well-being the next day. We introduce two different types of recovery-impeding experiences (problem-solving pondering and work-related affective rumination) related to cognitive and emotional stress processes. Our study thereby builds on and extends the stressor-detachment model (Sonnentag and Fritz, 2015) to understand entrepreneurs' well-being, providing a basis for future research on their stress and recovery. We also complement prior emphasis on the negative impact of stress on entrepreneurs' well-being (Cardon and Patel, 2015; Stephan, 2018) by offering a more hopeful account, highlighting how entrepreneurs can thrive by regulating their recovery during non-work time.

Third, our findings highlight the importance of accounting for different analysis levels and temporal perspectives (Lévesque and Stephan, 2020) when theorizing on entrepreneurs' well-being (Wiklund et al., 2019). Across entrepreneurs (at the between-person level aggregated over time), challenge stressors positively affected well-being. Yet in the short-term, from one workday to the next, dealing with challenge stressors impeded entrepreneurs' detachment from work and, in turn, depleted their well-being. This pattern

¹ We found a total of five studies that link detachment to constructs related to entrepreneurs' well-being. One cross-sectional study associated workaholism with burnout and psychosomatic complaints (Taris et al., 2008). A further cross-sectional study related home-work interference to self-reported insomnia (Kollmann et al., 2019). One semi-longitudinal study related physical, social, and leisure activity positively to self-reported health (Gunnarsson and Josephson, 2011). Two very small sample studies established a positive correlation between taking vacation and well-being (Rau et al., 2008; Vesala and Tuomivaara, 2015). In related research, two diary studies found that sleep efficiency and quality enhanced innovative idea generation (Weinberger et al., 2018; Williamson et al., 2019).

² In fact, cross-sectional studies conflate within- and between-person effects (McCormick et al., 2018).

indicates that entrepreneurs' well-being suffers on days when they experience more stressors than usual, because this “overloads” recovery processes. Furthermore, the mediating effects of impaired detachment occurred only at the within-person level, which highlights the value of a short-term micro-foundational perspective. It suggests that studies focusing only at the between-person level can mask important causal processes such as recovery (McCormick et al., 2018). In sum, our findings caution against generalizing effects across analysis levels and show the need for more time-sensitive theorizing on entrepreneurs' well-being (e.g., systematically considering different time spans from one workday, to one week, to several months).

3. Theoretical background

3.1. Entrepreneurs' well-being

Psychological well-being implies living in a good state (Warr, 2013, p. 77). When studying well-being, researchers often measure negative well-being, such as psychological strain and distress³ or impaired mental health (Topp et al., 2015). Our study focuses on positive well-being, because it stimulates creativity, growth mindset, and flourishing (e.g., Fredrickson, 2001; Keyes, 2013)—all important outcomes for entrepreneurs. Yet entrepreneurs' work settings also entail many stressors that suppress positive well-being.

One characteristic of entrepreneurs' work is high uncertainty (McMullen and Shepherd, 2006; Rauch et al., 2018). It might be unclear at the beginning of an entrepreneur's workday which tasks they will do. Some days might require intensely cognitively demanding work and extensive problem-solving, whereas others might involve managing interpersonal relationships and conflicts. Such uncertainty likely results in high *variability* in the levels of entrepreneurs' work stressors from one day to the next. Consequently, their well-being levels may also vary. However, research on entrepreneurs' well-being is predominantly conducted cross-sectionally and from a between-person perspective (considering differences in average well-being across entrepreneurs). This neglects that entrepreneurs' well-being varies over time. For instance, of the 144 studies in a review of entrepreneurs' mental health and well-being (Stephan, 2018), only three adopted a within-person perspective that can identify short-term changes in well-being (Foo et al., 2009; Totterdell et al., 2006; Uy et al., 2017).

The few within-person studies on entrepreneurs have revealed substantial variability in their weekly experience of work demands (stressors) and psychological strain (Totterdell et al., 2006), their daily positive and negative affect (Foo et al., 2009; Uy et al., 2017), their weekly effort and passion (Gielnik et al., 2015), and their daily sleep and idea generation (Weinberger et al., 2018; Williamson et al., 2019). For example, studying 65 self-employed portfolio workers over 26 weeks, Totterdell et al. (2006) found that weekly work demands increased psychological strain (anxiety and depression) while work autonomy decreased it. Studying 46 entrepreneurs in a business incubator twice daily for 24 days, Foo et al. (2009) showed that daily negative affect led them to focus on tasks that were immediately required whereas daily positive affect steered their effort toward tasks geared to the future. Finally, Uy et al. (2017) studied 63 entrepreneurs in an incubator and measured their affect twice daily for 15 consecutive days. The researchers created an innovative measure of entrepreneurs' affect regulation skill (affect spin), and found this skill to be negatively related to entrepreneurs' psychological strain, which was measured once.

3.2. Influences on entrepreneurs' well-being and work stress

As revealed by Stephan's (2018) recent review of research on entrepreneurs' well-being, the most frequently studied predictors of well-being are entrepreneurs' work characteristics (chiefly work demands and work autonomy) and entrepreneurs' personal characteristics (personality traits, skills, and motivations). Other correlates of well-being include financial and firm characteristics, social characteristics (e.g., social support, work-family conflict), and aspects of context. Stephan (2018) also observed reliance on relatively old theoretical models. For instance, research on work stressors has built on the role stressor model (Kahn et al., 1964), used a broad measure of job demands (workload: Karasek, 1979), or relied on working hours as a proxy for job demands (Millán et al., 2011).

Most studies in Stephan's (2018) review reported the expected negative relationship of such work stressors with entrepreneurs' well-being, including work-related well-being (job satisfaction). However, a few studies presented counter-intuitive findings. Bradley and Roberts (2004) found that work demands increased job satisfaction for a subset of entrepreneurs (new starters), while Millán et al. (2011) reported a positive relationship of working hours with job satisfaction. Stephan (2018) suggests that entrepreneurs may appraise some work stressors as entailing opportunities for personal growth and future achievement, and others as hindering these. She calls for future research to consider the challenge-hindrance stressor framework (LePine et al., 2005) to enable more accurate understanding of entrepreneurs' work stressors.

Stressors are generally defined as “the stimuli that induce the stress process” that results in psychological strain (anxiety, tension, and exhaustion) (Podsakoff et al., 2007, p. 439). Work stressors (also termed job demands) are “those physical, social, organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs” (Demerouti et al., 2001, p. 501). Examples are a high work pressure and emotionally demanding interactions with clients or customers (Bakker and Demerouti, 2017).

Surprisingly, we do not know how, i.e., through what mechanisms, work stressors impact entrepreneurs' well-being. In line with stressor-strain outcome models (Koeske and Koeske, 1993), research tests direct relationships between stressors and well-being

³ Among the most popular well-being measures is the General Health Questionnaire or GHQ-12 (Goldberg, 1978), which measures strain or distress as anxious and depressed moods.

(Stephan, 2018). Yet gaining insight into the mechanisms that mediate work stressors' effect on well-being would advance theoretical understanding of entrepreneurs' stress processes. It might also unearth new intervention opportunities to help entrepreneurs cope with their stressful work. We build on the stressor-detachment model (Sonnentag and Fritz, 2015) to explore entrepreneurs' recovery in non-work time as an important mechanism linking work stressors to well-being.

We next develop our hypotheses. We start by examining the effects of challenge and hindrance stressors on well-being and then consider impaired recovery as a mechanism mediating this relationship. Our hypotheses will consider both between- and within-person effects, aligning with the two different research streams we build on. Research on entrepreneurs' stressors and well-being is dominated by between-person studies using cross-sectional research designs. Conversely, research on detachment and recovery is typically conducted from a within-person perspective and employs diary-study designs. Our multilevel approach systematically examines both: (1) the average effects of entrepreneurs' work stressors on their well-being over time, capturing differences across entrepreneurs (McCormick et al., 2018); and (2) the short-term effects of day-to-day variations in work stressors on entrepreneurs' detachment from work and their well-being.

3.3. Challenge-hindrance stressor framework

The challenge-hindrance stressor framework (LePine et al., 2005) was introduced to make sense of the mixed findings in research on employee stress. Instead of proposing universally negative effects of stressors, it theorizes distinct effects of challenge and hindrance stressors on outcomes such as individual performance and satisfaction. *Challenge stressors* are work demands that a person evaluates as entailing opportunities to learn and achieve personal goals or growth; they trigger positive emotions and prompt increased effort (LePine et al., 2005, p.765). Typical challenge stressors include high workload, job demands, job complexity, and high responsibility (Cavanaugh et al., 2000; LePine et al., 2005). By contrast, *hindrance stressors* are work demands that "are appraised as having the potential to harm personal growth or gain, trigger negative emotions and a passive or emotional style of coping (e.g., withdrawing from the situation, rationalizing)" (LePine et al., 2005, p.765). Thus, dealing with hindrance stressors is straining, does not involve a sense of accomplishment, and results at best in adequate performance (Webster et al., 2011). Typical hindrance stressors are organizational politics, red tape, role ambiguity, and concerns about job security (Boswell et al., 2004; LePine et al., 2005).

Hindrance stressors lead to hindrance appraisals, whereas challenge stressors can invoke both challenge and hindrance appraisals, although challenge appraisals dominate (Webster et al., 2011). This corresponds with the findings of individual studies and meta-analyses, in which challenge stressors are positively and hindrance stressors negatively related to work-related outcomes, such as increased motivation, engagement, performance, and job satisfaction (Crawford et al., 2010; LePine et al., 2005). Both challenge and hindrance stressors can increase strain in the form of worries, tension, and anxiety (LePine et al., 2005). Yet challenge stressors are additionally associated with a sense of enthusiasm and thriving in challenging conditions, owing to the expectation of future goal attainment (Cavanaugh et al., 2000).

Entrepreneurs' work demands can also be categorized into challenge and hindrance stressors. For instance, entrepreneurs might experience mentally taxing tasks (cognitive demands) as challenging but also gain a sense of achievement and progress in work. Intense cognitive demands are work stressors that require concentrated information processing, such as when problems must be solved or when new, complex, or multifarious tasks must be completed correctly or under time pressure (e.g., de Jonge & Dormann, 2006). Such cognitive demands are typical work stressors for entrepreneurs (Hyytinen and Ruuskanen, 2007; Mueller et al., 2012). Entrepreneurs are also likely to experience emotional demands as hindering work progress and interfering with goal attainment. As work stressors, emotional demands include emotionally charged interactions with others at work (Heuven et al., 2006) and the emotional dissonance when felt emotions diverge from those one is socially expected to display (Holman et al., 2008). Entrepreneurs report their work to be emotionally demanding, especially their interpersonal relationships and conflicts with customers, suppliers, or employees (Lechat and Torres, 2017; Schonfeld and Mazzola, 2015).

3.3.1. Challenge stressors: cognitive demands and entrepreneurs' well-being

Entrepreneurs self-select into their stressful careers and are typically self-confident, optimistic, forward-looking, and resilient (Baron et al., 2016). With such a mindset, they are particularly likely to appreciate the potential for future goal attainment that their cognitively challenging work currently entails and interpret it as sign of progress. In contrast to employees for whom challenge stressors increase strain (e.g., LePine et al., 2005), entrepreneurs are likely better equipped to reap the well-being benefits of challenge stressors. Thus, we expect high cognitive demands to positively impact entrepreneurs' well-being at the between-person level (i.e., across entrepreneurs) and the within-person level (i.e., from one day to the next). Entrepreneurs who regularly experience higher levels of cognitive demands in their work are more likely to experience higher well-being as they appreciate the opportunities for development and goal attainment (between-person effects).

We also expect entrepreneurs who experience more cognitive demands than usual on a certain workday to report higher well-being the next day (within-person effects). As reviewed in Section 3.1, there is likely considerable daily variation in entrepreneurs' cognitive demands. For instance, cognitive demands can be extremely high when pitching to an investor, working with a supplier to solve a problem, or preparing a patent application. On such a day, an entrepreneur may experience a sense of progression and feel that the day's work has paved the way for future accomplishments (e.g., even if they did not obtain investor funding, they may have received feedback on how to improve). The few prior day-level studies on challenge stressors, albeit focused on employees, support the positive effect of daily challenge stressors on well-being. These studies found that daily challenging demands (e.g., time pressure) enhanced employees' daily engagement (Baethge et al., 2018; Garrick et al., 2014). Thus:

H1: Challenge stressors (cognitive demands) enhance entrepreneurs' well-being at the (a) between-person level and (b) within-person level.

3.3.2. Hindrance stressors: emotional demands and entrepreneurs' well-being

Entrepreneurs' well-being likely suffers when they experience high emotional demands (i.e., hindrance stressors) in their work. Emotional demands typically arise from entrepreneurs' interactions with the people on whom they depend to achieve business goals (e.g., employees, customers, suppliers, banks). Indeed, entrepreneurs report that conflicts with others (e.g., over late payments) are a main stress source (Lechat and Torres, 2017; Schonfeld and Mazzola, 2015).

As part of their work, entrepreneurs must display emotions that may be incongruent with those they experience. For instance, rather than express anger about late payment, they must maintain civil interaction with a customer to obtain the payment and possible future orders. Such interactions drain self-regulatory resources in entrepreneurs (Uy et al., 2017) and employees (Hülshager and Schewe, 2011) alike. Thus, high emotional demands deplete entrepreneurs' energy and divert attention and effort from running their business, thereby inhibiting personal growth and goal attainment, and acting as hindrance stressors (see LePine et al., 2005; Rodell and Judge, 2009). Indeed, emotional demands have been found to relate positively to work-related strain in entrepreneurs (Dijkhuizen et al., 2016). Thus, we expect entrepreneurs' who more regularly experience emotional demands in their work to have lower well-being than entrepreneurs who experience lower emotional demands (between-person effects). We equally expect that high emotional demands on a particular workday, for instance due to an unproductive meeting or disagreeing with an employee, will impair entrepreneurs' well-being in the short term, i.e., from one day to the next (within-person effect). Thus:

H2: Hindrance stressors (emotional demands) diminish entrepreneurs' well-being at the (a) between-person level and (b) within-person level.

3.4. Recovery: psychological detachment and perseverative thinking

After experiencing stressful workdays, people need to psychologically detach from work to recover and maintain their well-being (Sonnentag and Fritz, 2015; Sonnentag et al., 2017). Psychological detachment is "an individual's sense of being away from the work situation" (Etzion et al., 1998, p. 579), and implies feeling mentally disconnected from work during non-work time. Psychological detachment facilitates unwinding from work stressors and recharging. It is a recovery experience that is essential for well-being (Bennett et al., 2018; Sonnentag, 2018). A lack of psychological detachment is characterized by continuing, repetitive mental engagement with work (e.g., inability to stop thinking about work and contemplating work problems in leisure time). It "overlaps with concepts such as repetitive thought, worry, or rumination" (Sonnentag and Fritz, 2015, p. 74).

According to the stressor-detachment model (Sonnentag and Fritz, 2015), psychological detachment plays a crucial role in the stressor-strain process. The model highlights that work stressors not only trigger a stress reaction at work but can also cause sustained activation in non-work time; this spillover effect harms well-being (Sonnentag, 2018; Sonnentag and Fritz, 2015). Thus, one way in which work stressors decrease well-being is through impeding psychological detachment from work during non-work time (Sonnentag, 2018; Wendsche and Lohmann-Haislah, 2017). Because higher levels of stressors lead to higher levels of this sustained activation, detachment from work becomes particularly difficult, leading to continuous thinking and worrying about work in non-work time (Bennett et al., 2018; Wendsche and Lohmann-Haislah, 2017).

Continuous thinking about work in the absence of immediate work stressors is known as perseverative thinking (Brosschot et al., 2006; Croypley and Zijlstra, 2011). Defined as the "repeated or chronic activation of the cognitive representation of one or more psychological stressors" (Brosschot et al., 2005, p.114), it involves "repetitive, aversive, and often intrusive thought patterns" (Flaxman et al., 2012, p.8) focused on a perceived problem or stressor (Brosschot et al., 2006; Kirkegaard Thomsen, 2006). Perseverative thinking prolongs exposure to work stressors through their mental representations, resulting in sustained activation of stress-related physiological and emotional responses, and diminished well-being and health (Brosschot et al., 2006; Flaxman et al., 2012).

As reviewed in Section 2, we know very little about the effects of entrepreneurs' work stressors on their psychological detachment and well-being, despite recovery and detachment being particularly important for entrepreneurs given their stressful work. Research on entrepreneurs' recovery is rare and only emerging. Two cross-sectional studies have examined impaired recovery. One study associated entrepreneurs' continued engagement with work (workaholism) with burnout and psychosomatic complaints (Taris et al., 2008). The other examined how home-work interference affects self-reported insomnia (Kollmann et al., 2019). Another semi-longitudinal study positively linked physical, social, and leisure activities to entrepreneurs' self-reported health (Gunnarsson and Josephson, 2011). Finally, two diary studies found that sleep, as a recovery indicator, enhanced innovative idea generation (Weinberger et al., 2018; Williamson et al., 2019).⁴

In sum, the evidence from employee research and emerging evidence from entrepreneur research suggests that psychological detachment is an important mechanism mediating how stressors affect well-being. After a very stressful workday, entrepreneurs are less likely to be able to psychologically detach from work that evening. Instead, they may engage in perseverative thinking and experience intrusive and repetitive thoughts, such as trying to generate ideas for developing their firms or worrying about sales.

Recent recovery research differentiates two aspects of perseverative thinking: problem-solving pondering and work-related affective rumination (Croypley and Zijlstra, 2011). Problem-solving pondering is a more productive form of perseverative thinking,

⁴ Two further studies with very small samples established a positive correlation between taking vacation and well-being (Rau et al., 2008; Vesala & Tuomivaara, 2015).

whereas affective rumination entails negative emotions, especially worrying. We expect challenge stressors to induce problem-solving pondering and hindrance stressors to cause affective rumination.

3.4.1. Challenge stressors, problem-solving pondering, and well-being

We suggest that challenge stressors (high cognitive demands) are particularly likely to trigger problem-solving pondering in entrepreneurs' non-work time, in turn increasing their well-being. High challenge stressors are positively associated with work engagement (Crawford et al., 2010) and autonomous work motivation, whereby work appears meaningful and joyful (Tadić Vujčić et al., 2017). Challenge stressors also increase positive feelings during the workday (Cavanaugh et al., 2000) and generate positive affect at the end of the day (Tadić Vujčić et al., 2017), causing prolonged activation that spills over to non-work time and may interfere with entrepreneurs' recovery. Instead of completely switching off, entrepreneurs facing high cognitive demands likely engage in problem-solving pondering: "a form of thinking that may be characterized by prolonged mental scrutiny of a particular problem or an evaluation of previous work ... to see how it can be improved, but ... does not involve the emotional process that sustains arousal" (Cropley and Zijlstra, 2011, p.11).

Although problem-solving pondering prevents psychological detachment from work in non-work time, it might not necessarily diminish entrepreneurs' well-being. Rather, problem-solving pondering can be a resource-gaining experience, involving emotionally neutral and constructive thoughts that aid progression toward solving work-related problems (Cropley and Zijlstra, 2011). Entrepreneurs might enjoy thinking about how to improve their performance. For example, when dealing with a cognitively demanding task, such as introducing a new product to market, they will probably consider potential customers and the most effective product launch strategy after finishing work (e.g., while traveling home or eating dinner). By mentally testing different solutions, entrepreneurs engaged in problem-solving pondering move closer to attaining goals and experience positive emotions and increased well-being.

These positive effects may occur at both the between- and within-person levels. From a between-person perspective, entrepreneurs who typically experience higher cognitive demands (e.g., because their products or services are more complex) are more likely to regularly engage in problem-solving pondering and experience higher well-being than entrepreneurs who experience lower cognitive demands. We predict the same pattern in the short term (within-person perspective). Entrepreneurs handling an extremely challenging demand on a particular workday might continue to ponder work issues that evening, which may help them develop new solutions to work problems and thereby generate positive emotions that increase their well-being the next day. Overall, we expect problem-solving pondering to mediate the positive effect of cognitive demands on well-being at the between-person and within-person levels. Thus:

H3: The positive effect of challenge stressors (cognitive demands) on well-being is mediated by problem-solving pondering at the (a) between-person level and (b) within-person level.

3.4.2. Hindrance stressors, work-related affective rumination, and well-being

Hindrance stressors (emotional demands) are likely to lead to more "unproductive" perseverative thinking in entrepreneurs' non-work time. Emotional demands elicit negative emotional reactions that persist and turn into work-related affective rumination in non-work time (Sonnetag and Fritz, 2015; Widmer et al., 2012). Affective rumination is "a cognitive state characterized by the appearance of intrusive, pervasive, recurrent thoughts, about work, which are negative in affective terms" (Cropley and Zijlstra, 2011, p. 10). These intrusive thoughts entail dysfunctional emotions, e.g., feelings of worry, tension, or annoyance, stemming from the negative work events that triggered them (Binnewies et al., 2009). Thus, affective rumination prolongs exposure to the emotional stressor, its accompanying negative emotions, and the psychophysiological activation they generate (Brosschot et al., 2005). It, thereby, inhibits recovery processes and harms well-being. For instance, employee studies have found that recurring worries about work-related issues during non-work time produce higher negative affect (Wang et al., 2013) and higher salivary cortisol (Cropley et al., 2015).

An entrepreneur who experienced conflict with an employee during the day (high emotional demands) may continue contemplating this situation during a family dinner, while watching TV, or when trying to sleep. This may lead the entrepreneur to feel tense, annoyed, or agitated, either with themselves or the other party. Each time these thoughts recur, self-regulatory resources need to be mobilized to handle the consequent negative emotions; this makes work-related affective rumination especially draining and, thus, harmful to well-being.

Work-related affective rumination is likely to mediate the negative effect of emotional demands on well-being at both the between- and within-person levels. First, entrepreneurs who more frequently encounter conflict with stakeholders (i.e., higher emotional demands) will regularly experience higher work-related affective rumination in non-work time and will, in turn, experience lower well-being. Second, at the within-person level, a specific day with more hindrance stressors (e.g., having to dismiss an employee) will increase work-related affective rumination that evening, leading to lower well-being the next day. Thus:

H4: The negative effect of hindrance stressors (emotional demands) on well-being is mediated by work-related affective rumination at the (a) between-person level and (b) within-person level.

Fig. 1 summarizes our research model.

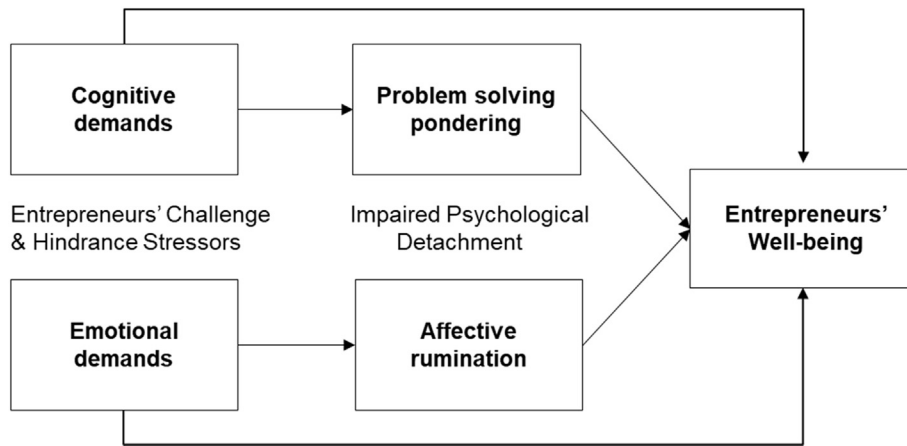


Fig. 1. Conceptual model of entrepreneurs' stress-recovery processes and well-being.

4. Methodology

4.1. Data collection

We conducted a 12-day diary study with repeated measures to separate the between- and within-person effects of work stressors on well-being (Curran and Bauer, 2011; Raudenbush and Bryk, 2002). Each evening, we collected daily data, combining and adapting the methods of day reconstruction (Kahneman et al., 2004) and experience sampling (Uy et al., 2010). We used day reconstruction to capture entrepreneurs' experience of cognitive and emotional demands during their workdays; we used experience sampling to capture entrepreneurs' momentary experience of work-related perseverative thinking, i.e., problem-solving pondering and work-related affective rumination (mediator variables), in the evening. In the morning of each following day, we used experience sampling to assess well-being (dependent variable). Overnight, we assessed objective sleep efficiency (control variable).

Resource constraints prevented surveying all the entrepreneurs concurrently, so data were collected between April 2014 and March 2015, i.e., some participated earlier and others later. The typical procedure was as follows. Consenting entrepreneurs participated in the study for 12 consecutive calendar days from a Monday to the following Friday. Entrepreneurs completed a demographic questionnaire online ($n = 43$) or in paper-and-pencil form ($n = 12$) at the beginning of the study. Each evening, trained research assistants made five-minute calls to the entrepreneurs at prearranged times after their working day had ended ($M = 8:52$ p.m.; $SD = 02:19$; $n = 386^5$). The interviewers asked standardized questions, which entrepreneurs answered using rating scales they had received beforehand. We handed out morning protocols for each day and asked entrepreneurs to rate their well-being every morning after waking up. Entrepreneurs wore Actiwatch wristband devices that recorded their sleeping times, from 18:00 on the first Monday to 18:00 on the last Friday.

At the within-person level, we analyzed relationships across consecutive working days, i.e., *day-pairs*, with the independent and mediator variables measured on day d , and the dependent variable, well-being, in the morning of the next day ($d + 1$).

4.2. Sample

Our sample are “everyday entrepreneurs,” i.e., owner-managers and self-employed (Aldrich and Ruef, 2018; Welter et al., 2017), which fits the longstanding occupational definition of entrepreneurs as individuals who work for their own account and risk (e.g., Gorgievski and Stephan, 2016; Hébert and Link, 1982). We recruited entrepreneurs via our private networks and during entrepreneurship events. Initially, 128 entrepreneurs expressed interest in participating. We offered feedback on sleep efficiency, well-being, and the study's results to encourage participation. We also guaranteed anonymity and voluntary participation. When scheduling dates, 85 individuals were willing to participate (response rate of 66.41%). After excluding (i) three persons who dropped out, (ii) eight managers without ownership, and (iii) 17 participants with missing data, our final sample comprised 55 entrepreneurs (42.97% of 128).

We excluded non-working days⁶ (i.e., \leq four hours' work), sick days (Winzeler et al., 2014), and days with missing values⁷ for the dependent, independent, or control variables. After this data cleaning process, we excluded participants for whom fewer than three

⁵ In five cases, entrepreneurs completed a written version of this interview because it was too late to call them. In another five cases, we conducted the interview the next day because the entrepreneurs were not contactable in the evening. Excluding these ten cases did not change the results reported in Tables 2 and 3.

⁶ This refers to the independent and control variables, which we collected on day d . As we collected the dependent variable, well-being, on day $d + 1$, we include entrepreneurs' well-being the next morning for working days (84.5%), non-working days (14.2%), and non-specified days (1.3%).

⁷ These occurred due to technical problems, participants not completing morning protocols, or not participating in evening interviews.

“day-pairs” of data were available. This resulted in 386 day-pairs, with three to nine per participant ($M = 7.02$; $SD = 1.45$), which is comparable to the average number of data points per participant used in similar entrepreneurship studies (Gielnik et al., 2015). Notably, one data point is a day pair containing lagged data (independent and mediator variables measured at day d and well-being the next morning $d + 1$), similar to Foo et al. (2009). The 386 data points represent 63.80% of 605 potential days for the 55 entrepreneurs (55×11). This does not bias our estimation procedures as multilevel analysis can accommodate unequal day samples per participant (Tabachnick and Fidell, 2013).

Participants were between 27 and 62 years old ($M = 40.56$; $SD = 10.22$), mostly male (85.5%), and either German (98.2%) or Austrian (1.8%). Most had a higher education degree (85.5%) and lived with a partner (78.8%), while 38.2% had one to three children aged under 18 living at home. Almost all of their businesses were based in Saxony (94.55%), and all but one had been founded < 25 years before the survey (the exception was founded in May 1949). Most entrepreneurs were founders ($n = 45$; 81.8%); the others owned and managed firms founded by someone else ($n = 10$, 18.2%). Most firms had been operating in the market for at least 3.5 years ($N = 36$, 65.5%), while 58.2% ($N = 32$) of firms had done so for more than five years. In terms of entrepreneurial experience, entrepreneurs had worked in their firms for 8.73 years on average ($SD = 8.74$, Range: 21 weeks to 44 years). Most entrepreneurs had employees (85.5%, $N = 47$); only eight participants were self-employed with no employees. The average number of employees was 11.55 ($SD = 24.27$; Range: 0–166). According to the EU definition of SMEs, 39 entrepreneurs (70.9%) owned micro businesses with fewer than 10 employees, 14 (25.2%) owned small businesses with 10 to 49 employees, and two (3.6%) owned medium-sized businesses with 50 or more employees ($n = 2$; 3.6%), mainly in the service sector (87.3%). In 2013, participants' average turnover was EUR 1.4 million ($n = 49$; $SD = 3.76$; Range: EUR 0.01–19.80 million). To rule out the impact of sample characteristics on our results, we performed robustness checks controlling for whether a business: a) was established vs. newly founded (younger/older than 3.5 years); b) had been operating in the market for more vs. less than five years; and c) had employees vs. comprised a self-employed entrepreneur. The results are reported in Section 5.3.

4.3. Measures

We used standardized 5-point Likert scales (1 = totally disagree; 5 = totally agree) to assess study variables. As is common in diary studies, we tried to minimize the number of items to avoid demoralizing participants, given the demands of multiple measurements over 12 days (Foo et al., 2009; Scollon et al., 2003; Uy et al., 2010; Uy et al., 2015).

4.3.1. Dependent variable: well-being

To measure entrepreneurs' daily well-being in the morning protocols, we used the German version of the World Health Organization Well-Being Index (WHO-5) (Brähler et al., 2007). Because the WHO-5 refers to the past two weeks, we changed the referent to measure daily well-being. The five items were, “In this moment, I feel...”: “cheerful and in good spirits”; “calm and relaxed”; “active and vigorous”; “fresh and rested”; and “that my daily life is filled with things that interest me.” Cronbach's alpha was 0.87 ($N = 386$) across the day sample.

4.3.2. Independent variables: challenge and hindrance work stressors

During the evening telephone interviews, we assessed challenge and hindrance work stressors with two items each, taken from the German version of the Demand-Induced Strain Compensation Questionnaire (DISQ) (Dormann et al., 2004). Two-item scales and even single-item scales are common in diary research, both generally and for entrepreneurs, to enhance response rates and minimize participants' burden (Foo et al., 2009; Scollon et al., 2003; Uy et al., 2010; Uy et al., 2015). As the DISQ was developed for employees, we selected items applicable to the entrepreneurial work setting. Following Eisinga et al. (2013), we calculated Spearman-Brown reliability estimates, which were equal to the Cronbach's alpha values reported below.

Challenge stressors were measured as *daily cognitive demands* with two items from the DISQ. We changed the referent to the specific work day: “Today, during my work, I have had to...”: “display high levels of concentration and precision”; and “do a lot of mentally taxing work.” Cronbach's alpha was 0.67 ($N = 386$). We selected these items because they focus on information processing, which is essential for entrepreneurial work settings. A confirmatory factor analysis confirmed good reliability (Squared Multiple Correction (SMC) > 0.40).

Hindrance stressors were measured as *daily emotional demands* with two further items from the DISQ. We changed the referent to the specific work day: “Today, during my work, I have had to...”: “do a lot of emotionally draining work”; and “display emotions (e.g., toward employees, colleagues, suppliers, or clients) that are inconsistent with my current feelings.” We selected these two items for their fit with the entrepreneurial work context, which can entail emotionally draining interactions and conflicts with clients, employees, and suppliers (e.g., Lechat and Torres, 2017). Cronbach's alpha was 0.60 ($N = 386$), which is acceptable in this context for a two-item scale, given that Cronbach's alpha increases with the number of items in a scale (Cortina, 1993). Furthermore, a confirmatory factor analysis confirmed good reliability for the two daily items (SMC > 0.40).

4.3.3. Mediators: problem-solving pondering and work-related affective rumination

Problem-solving pondering was measured with five items from the German version of the Work-Related Rumination Questionnaire (WRRQ) (Cropley et al., 2012; Querstret and Cropley, 2012). We changed the referent to daily assessment in the evening interviews. Sample items were “Today, after work, I have...”: “tended to think of how I can improve my work-related performance”; and “found myself re-evaluating something I have done at work.” Cronbach's alpha was 0.81 ($N = 386$).

Daily work-related affective rumination was measured with another five items from the German WRRQ (Cropley et al., 2012;

Querstret and Cropley, 2012). Again, the referent was changed to daily assessment in the evening interviews. Sample items were “Today, after work, I have...”: “become tense when I thought about work-related issues”; and “been annoyed by thinking about work-related issues.” Cronbach's alpha was 0.83 ($N = 386$).

4.3.4. Control variables

At the between-person level, we controlled for age (in years) and gender (0 = female, 1 = male) as reported by entrepreneurs in the demographic questionnaire. Previous research often controls for the effects of entrepreneurial experience and firm performance (Gielnik et al., 2015; Uy et al., 2013). We operationalized entrepreneurial experience as tenure, i.e., the length of time the entrepreneurs have led their firms. Firm performance was measured with four items (Cronbach's $\alpha = 0.90$, $N = 55$) that captured entrepreneurs' satisfaction with the firm's profit, revenue, and financial situation and with their own personal income. A sample item was “How satisfied are you with your personal income?” The response scale ranged from 1 = very satisfied to 5 = very dissatisfied.

At the within-person level, we controlled for time, i.e., the consecutive number assigned to each working day analyzed for each participant. This variable controls for changes in the dependent variable's linear trajectory. We also controlled for well-being on the previous morning (day d), as the autocorrelation of the dependent variable (well-being on day $d + 1$).

We controlled for entrepreneurs' daily sleep efficiency at the between-person and within-person levels. As an alternative indicator of recovery, controlling for sleep allows us to rule out an alternative explanation for the effects of perseverative thinking. We measured sleep efficiency via actigraphic devices worn by entrepreneurs as a wristband (Actiwatch 2, Philips Respironics, PA, USA). The Actiwatch is equipped with an accelerometer that registers motion from the non-dominant wrist. It creates raw scores of activity for 24 h a day. Actigraphy data were recorded in 30-s intervals, which is a standard threshold (Weiss et al., 2010). We analyzed sleep data, including “total time in bed” (hours), “total time asleep” (hours), and “sleep efficiency,” using standard algorithms (Respironics, 2009). Sleep efficiency was calculated by time asleep as a percentage of total time in bed. The Actiwatch is a reliable and valid instrument for objectively assessing sleep (Sadeh, 2011). Actigraphy measurements using this device closely correlate with data obtained through polysomnography (Electroencephalography (EEG) sleep laboratory data) (Rupp and Balkin, 2011).

4.4. Statistical analyses

4.4.1. Confirmatory factor analyses

We employed confirmatory factor analyses (CFAs) to establish our measures' construct validity. We first compared a five-factor model incorporating cognitive demands, emotional demands, problem-solving pondering, work-related affective rumination, and well-being with a restricted model in which those five variables loaded onto one factor. The unrestricted five-factor model ($\chi^2 = 498.44$, $df = 146$, $p \leq 0.001$, RMSEA = 0.08, CFI = 0.87) had a significantly better model fit ($\Delta\chi^2 = 1307.58$, $df = 6$, $p < 0.0001$) than the single-factor model ($\chi^2 = 1806.02$, $df = 152$, $p \leq 0.001$, RMSEA = 0.17, CFI = 0.41).

Second, we conducted a CFA to confirm that cognitive and emotional demands are separate constructs. The unrestricted two-factor model in which the items of cognitive and emotional demands loaded on separate factors ($\chi^2 = 22.621$, $df = 4$, $p \leq 0.01$, RMSEA = 0.10, CFI = 0.93) fitted the data significantly better ($\Delta\chi^2 = 57.46$, $df = 2$; $p < 0.0001$) than the one-factor model ($\chi^2 = 80.08$, $df = 2$, $p \leq 0.01$, RMSEA = 0.32, CFI = 0.60). This indicates good discriminant validity for our measures of the challenge and hindrance stressors.

Third, we conducted a CFA to confirm that problem-solving pondering and affective rumination represent two distinct constructs. The two-factor model ($\chi^2 = 205.70$, $df = 34$, $p \leq 0.001$, RMSEA = 0.12, CFI = 0.88) fitted the data significantly better ($\Delta\chi^2 = 376.45$, $df = 1$, $p < 0.0001$) than the model in which all items loaded on one factor ($\chi^2 = 582.15$, $df = 35$, $p \leq 0.001$, RMSEA = 0.20, CFI = 0.62).

Fourth, we conducted a CFA to confirm that emotional demands, work-related affective rumination, and well-being are distinct constructs. The unrestricted three-factor model ($\chi^2 = 192.98$, $df = 51$, $p \leq 0.001$, RMSEA = 0.09, CFI = 0.93) fitted the data significantly better ($\Delta\chi^2 = 815.13$, $df = 3$, $p < 0.0001$) than the model in which all items loaded on one factor ($\chi^2 = 1008.11$, $df = 54$, $p \leq 0.001$, RMSEA = 0.21, CFI = 0.50). This demonstrates that these three constructs are separate and that our measures have good discriminant validity.

4.4.2. Multilevel analysis

Our data have a nested structure, with the within-person level (Level 1) nested in the between-person level (Level 2), and daily data nested within individual entrepreneurs. Multilevel analysis (Raudenbush and Bryk, 2002) allowed us to account for this hierarchical data structure and establish a temporal data sequence (Curran and Bauer, 2011). We employed multilevel structural equation modeling (Preacher et al., 2011).

At the between-person level, we centered variables at their mean across the sample ($N = 55$). We included the person-means (i.e., the average scores for each entrepreneur across study days) for all independent variables. At the within-person level, we removed between-person variation by person-mean centering all daily independent and control variables, except for time. These centered within-person variables represent daily deviations from the person-mean scores across all analyzed days. Such centering is standard procedure in diary studies to separate out more stable person effects from daily variation (e.g., Foo et al., 2009; Sonnentag and Lischetzke, 2018). It avoids multicollinearity and produces more stable estimations (Field, 2013). Our dependent variable (well-being) and between-person control variables (age, gender, entrepreneurial experience, and firm performance) remained uncentered (Tabachnick and Fidell, 2013).

This approach allowed us to separately model the differences across individuals over time and the short-term variations for each

individual at the within-person level, which is a strength of diary and multilevel studies (as comprehensively discussed by McCormick et al., 2018). We used full maximum likelihood estimation to obtain accurate estimates of fixed effects and enable comparison of fit indices between the models using likelihood ratio tests (e.g., Estrin et al., 2013). We estimated the models with fixed slopes (random intercept models).

4.4.3. Testing hypotheses

We tested our hypotheses through multilevel structural equation modeling in STATA v14. We first calculated the null model with the intercept as the only predictor, followed by Model 1 that included the between-person control variables (age, gender, firm performance, entrepreneurial experience, and objective sleep efficiency) and within-person control variables (time, well-being on the previous day, and objective sleep efficiency). Model 2 includes our independent variables (challenge and hindrance stressors at the between- and within-person levels) and the control variables. We tested the improvement from one model to the next using the log-likelihood statistic ($-2 \cdot \log$). In Model 3 we added our Level 1 within-person mediators (problem-solving pondering and work-related affective rumination) and their person-means at the between-person Level 2. Model 3 is the full model as presented in Fig. 1.

To test the significance of the mediating (indirect) effects, we followed Preacher et al.'s (2010) methodology for multilevel models. We tested the same mediating relationships at Level 2 (between-person) and Level 1 (within-person) simultaneously. This approach avoids conflated estimations of within-person relationships, since otherwise between-person relationships might be detected as within-person relationships. Table 3a and b present these results. We tested direct effects paths a and b and indirect effects paths a*b for significance. The direct effect of stressors (independent variables) on well-being (dependent variable) was not required to be significant in order to test for indirect effects (Hayes, 2009; Zhao et al., 2010).

5. Results

5.1. Descriptive statistics

We used the variance estimates from the null model to calculate the intra-class correlation (ICC) as the ratio of between-person to total variance (Tabachnick and Fidell, 2013). Within-person variance accounted for over half of the total variance in well-being (51.08%), 71.25% in cognitive demands, 64.74% in emotional demands, 52.93% in problem-solving pondering, and 67.25% in work-related affective rumination. Thus, multilevel analysis was appropriate to test our hypotheses. Table 1 displays all variables' means, standard deviations, and correlations.

Over half of entrepreneurs (62%, $N = 34$) assessed their well-being as low or very low ("not good at all or very little" or "a little"), while only three (5%) reported "good" or "excellent" well-being. Regarding work stressors, 25% ($N = 14$) "rather agree" or "absolutely agree" that they experience high cognitive demands, while 67% ($N = 37$) "completely disagree" or "rather disagree" that they face high emotional demands. Regarding psychological detachment in the evening, 33% ($N = 18$) reported not engaging in problem-solving pondering (answering "completely disagree" or "rather disagree") and 73% ($N = 40$) reported no or little work-related rumination ("completely disagree" or "rather disagree").

5.2. Hypotheses tests

Model 1 in Table 2, which only included the control variables, did not fit the data significantly better than the null model ($\Delta -2 \log = 14.71$, $\Delta df = 8$, $p = 0.065$). Model 2 included cognitive and emotional demands at the within- and between-person levels and showed significant improvement over Model 1 ($\Delta -2 \log = 15.16$, $\Delta df = 4$, $p = 0.004$). In Model 3 we added problem-solving pondering and affective rumination as mediator variables at both levels to test the indirect effects of challenge and hindrance work stressors on entrepreneurs' daily well-being. The predictors in our hypothesized model explain 21% of the variance in well-being at the between-person level and 8% at the within-person level, beyond the variance explained by the control variables (see Pseudo- R^2 estimates in Table 2).

5.2.1. Direct effects of challenge and hindrance stressors on entrepreneurs' well-being

H1a and H1b predicted direct positive effects of cognitive demands on entrepreneurs' well-being. Cognitive demands positively predicted entrepreneurs' well-being at the between-person level ($\beta = 0.50$, $p = 0.001$, Table 2 (top), Model 2), thus supporting H1a. However, H1b was not supported since cognitive demands did not significantly relate to well-being at the within-person level ($\beta = -0.01$, $p = 0.847$, Table 2 (bottom), Model 2).

In line with H2a, emotional demands negatively predicted entrepreneurs' well-being at the between-person level ($\beta = -0.34$, $p = 0.005$, Table 2 (top), Model 2). However, contrary to H2b, we found no effect of emotional demands on well-being at the within-person level ($\beta = -0.03$, $p = 0.587$, Table 2 (bottom), Model 2).

5.2.2. Indirect effects of challenge and hindrance stressors on entrepreneurs' well-being via perseverative thinking

We proceeded stepwise to test the indirect effects of challenge and hindrance stressors on entrepreneurs' well-being via perseverative thinking (H3 and H4). The results are reported in Table 3. First, we tested the model without indirect effects to obtain estimates for the total effects (paths c) of between- and within-person cognitive demands and emotional demands on entrepreneurs' well-being (Table 3). Second, we tested the complete hypothesized model (Fig. 2; Table 2, Model 3) containing between- and within-person problem-solving pondering (paths a, b, c, c': Table 3 (top)) and work-related affective rumination (paths a, b, c, c': Table 3

Table 1
Means, standard deviations, and zero-order correlations.

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
<i>Level 1</i>														
1 Well-being (day d + 1)	2.79	0.83	-	0.14**	-0.16**	-0.12*	-0.26**	0.52**	-0.01	0.05	0.11*	0.08	0.35**	0.03
2 Cognitive demands (day d)	3.63	0.85	0.32*	-	0.10*	0.11*	0.05	0.14**	-0.04	0.20**	0.18**	-0.25**	0.15**	0.00
3 Emotional demands (day d)	1.84	0.90	-0.31*	0.18	-	0.12*	0.47**	-0.19**	-0.03	0.04	0.06	-0.26**	-0.06	0.09
4 Problem-solving pondering (day d)	2.41	0.91	-0.02	0.09	0.14	-	0.34**	-0.06	-0.04	0.04	-0.22**	-0.11*	-0.21**	0.15**
5 Affective rumination (day d)	1.71	0.75	-0.37**	-0.08	0.61**	0.32*	-	-0.25**	-0.04	-0.01	-0.13**	-0.06	-0.17**	0.096
6 Well-being (day d)	2.75	0.83	0.52**	0.31*	-0.29*	-0.05	-0.41**	-	-0.01	0.02	0.15**	0.06	0.36**	0.04
7 Time	4.16	2.22	0.05	0.11	0.05	-0.02	-0.29*	0.13	-	-0.05	0.06	-0.07	-0.05	0.01
8 Sleep efficiency	86.50	6.79	0.13	0.48**	-0.05	0.04	-0.17	0.08	0.05	-	0.15**	-0.17**	0.10*	0.01
<i>Level 2</i>														
9 Age	40.56	10.22	0.16	0.30*	0.08	0.32*	-0.24	0.22	0.26	0.22	-	-	-	-
10 Gender ^a	0.85	0.36	0.07	-0.41**	-0.36**	-0.18	-0.05	0.03	-0.25	-0.24	-0.13	-	-	-
11 Entrepreneurial experience ^b	8.73	8.74	0.42**	0.24	-0.08	-0.32*	-0.27*	0.44**	-0.05	0.16	0.61**	-0.04	-	-
12 Firm performance	2.84	0.98	0.03	0.00	0.16	0.23	0.17	0.05	-0.04	0.00	-0.03	-0.16	-0.01	-

Note: Correlations above the diagonal are within-person correlations (N = 386). Correlations below the diagonal are between-person correlations (N = 55). *p ≤ 0.05; **p ≤ 0.01 (2-tailed);^a 0 = Female, 1 = Male; ^b number of years entrepreneur leads the firm. Means and standard deviations of daily variables are aggregated across all days.

Table 2
Multilevel estimates for models with daily well-being the next morning (day d + 1) as dependent variable.

	Model 0				Model 1				Model 2				Model 3			
	Est	SE	z	p	Est	SE	z	p	Est	SE	z	p	Est	SE	z	p
Intercept	2.79	0.09	32.73	0.000	1.50	1.42	2.03	0.042	2.24	1.36	1.65	0.099	2.40	1.37	1.75	0.079
<i>Between-person variables (level 2)</i>																
Age					-0.01	0.01	-1.12	0.261	-0.01	0.01	-1.21	0.226	-0.01	0.01	-1.35	0.177
Gender ^a					0.19	0.21	0.88	0.380	0.21	0.21	0.99	0.320	0.30	0.22	1.37	0.170
Firm performance					0.06	0.08	0.74	0.462	0.09	0.07	1.26	0.208	0.08	0.07	1.23	0.218
Entrepreneurial experience					0.00***	0.00	-3.60	0.000	0.00***	0.00	-3.40	0.001	0.00***	0.00	3.39	0.001
Sleep efficiency					0.01	0.02	0.80	0.425	-0.01	0.01	-0.80	0.422	-0.01	0.02	-0.88	0.381
Cognitive demands									0.50***	0.15	3.25	0.001	0.47**	0.15	3.06	0.002
Emotional demands									-0.34**	0.12	-2.83	0.005	-0.17	0.16	-1.09	0.275
Problem-solving pondering													0.11	0.12	0.96	0.335
Affective rumination													-0.31+	0.19	-1.66	0.098
<i>Within-person variables (level 1)</i>																
Time					0.00	0.01	0.10	0.918	0.00	0.01	0.10	0.924	-0.00	0.01	-0.09	0.928
Well-being (day d)					-0.03	0.06	-0.56	0.576	-0.03	0.06	-0.60	0.547	-0.06	0.05	-1.04	0.299
Sleep efficiency					0.00	0.01	0.29	0.770	0.00	0.01	0.32	0.746	0.00	0.01	0.36	0.722
Cognitive demands (day d)									-0.01	0.05	-0.19	0.847	0.02	0.05	0.46	0.640
Emotional demands (day d)									-0.03	0.05	-0.54	0.587	0.03	0.05	0.63	0.532
Problem-solving pondering (day d)													-0.16***	0.05	-3.26	0.001
Affective rumination (day d)													-0.13*	0.06	-2.09	0.036
-2 log (lh)	-409.99				-402.64				-395.06				-1603.43			
$\Delta -2 \log$ (Chi-Square, df, p-value)						14.71	df = 8	p = 0.0650		15.16	df = 4	p = 0.0044				
AIC	825.99				827.28				820.12				3268.86			
Level 2 intercept variance σ_w^2	0.34	0.08			0.25	0.06			0.18	0.05			0.18	0.04		
Level 1 intercept variance σ_w^2	0.37	0.03			0.37	0.03			0.37	0.03			0.34	0.03		
Δ Pseudo-R2 relative to Model 1 and 2 respectively									Level 2	21%			Level 2	Level 1	0%	
									Level 1	0%			Level 2	Level 1	8%	

Note: Est = Estimate (unstandardized), SE = Standard error, AIC = Akaike Information Criterion, Σ_w^2 = within-person intercept variance, σ_w^2 = between-person intercept variance, N at between-person level = 55, N at within-person level = 386. + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$, ^a 0 = Female, 1 = Male. Pseudo-R2 relative to previous model.

Table 3

Multilevel structural equation modeling: Total, direct, and indirect effects of stressors on well-being via perseverative thinking.

	Est	SE	z	p	95% Conf. Interval	
Cognitive Demands > Problem-solving Pondering > Well-being (H3a and H3b)						
<i>Between-person level</i>						
c (Step 1): Total effect of cognitive demands on well-being	0.50	0.15	3.25	0.001	0.20	0.80
c' (Step 2): Direct effect of cognitive demands on well-being	0.47	0.15	3.06	0.002	0.17	0.77
a (Step 2): Direct effect of cognitive demands on problem-solving pondering	0.09	0.06	1.49	0.136	-0.03	0.21
b (Step 2): Direct effect of problem-solving pondering on daily well-being	0.11	0.12	0.96	0.335	-0.12	0.35
ab (Step 3): Indirect effect of cognitive demands via problem-solving pondering on well-being	0.01	0.01	0.81	0.418	-0.01	0.03
<i>Within-person level</i>						
c (Step 1): Total effect of cognitive demands on well-being	-0.01	0.05	-1.09	-0.847	-0.01	0.08
c' (Step 2): Direct effect of cognitive demands on well-being	0.02	0.05	0.46	0.642	-0.07	0.11
a (Step 2): Direct effect of cognitive demands on problem-solving pondering	0.12	0.05	2.50	0.012	0.03	0.22
b (Step 2): Direct effect problem-solving pondering on well-being	-0.16	0.05	-3.26	0.001	-0.26	-0.06
ab (Step 3): Indirect effect cognitive demands via problem-solving pondering on well-being	-0.02	0.01	-1.98	0.047	-0.04	-0.00
Emotional Demands > Affective Rumination > Well-being (H4a and H4b)						
<i>Between-person level</i>						
c (Step 1): Total effect of emotional demands on well-being	-0.34	0.12	-2.83	0.005	-0.58	-0.11
c' (Step 2): Direct effect of emotional demands on well-being	-0.17	0.16	-1.09	0.275	-0.49	0.14
a (Step 2): Direct effect of emotional demands on affective rumination	0.51	0.03	16.17	0.000	0.44	0.57
b (Step 2): Direct effect of affective rumination on well-being	-0.31	0.19	-1.66	0.098	-0.68	0.06
ab (Step 3): Indirect effect of emotional demands via affective rumination on well-being	-0.16	0.10	-1.65	0.099	-0.34	0.03
<i>Within-person level</i>						
c (Step 1): Total effect of emotional demands on well-being	-0.03	0.05	-0.54	0.590	-0.12	0.07
c' (Step 2): Direct effect of emotional demands on well-being	0.03	0.05	0.63	0.532	-0.06	0.12
a (Step 2): Direct effect of emotional demands on affective rumination	0.30	0.04	7.44	0.000	0.22	0.38
b (Step 2): Direct effect of affective rumination on daily well-being	-0.13	0.06	-2.09	0.036	-0.24	-0.01
ab (Step 3): Indirect effect emotional demands via affective rumination on well-being	-0.04	0.02	-2.02	0.044	-0.08	-0.00

Note: Est = Estimate (unstandardized). SE = Standard Error. N at between-person level = 55. N at within-person level = 386. Controls: age, gender, firm performance, entrepreneurial experience, sleep efficiency, time, within-person well-being the previous day.

(bottom)). Third, we tested the indirect effects (paths a*b) for significance, which indicates mediation.

H3a and H3b predicted that problem-solving pondering mediates the positive effect of cognitive demands on entrepreneurs' well-being. Table 3 (top) shows that between-person cognitive demands did not significantly increase between-person problem-solving pondering (path a). Further, between-person problem-solving pondering did not significantly increase entrepreneurs' well-being (path b). The indirect effect was also insignificant: $B = 0.01$, $p = 0.418$, $CI: [0.01, -0.03]$. Therefore, H3a is not supported.

As reported in Table 3 (top), at the within-person level we found a significant positive effect of cognitive demands on problem-solving pondering (path a) and a significant negative effect of problem-solving pondering on well-being (path b). The indirect effect of day-specific cognitive demands on well-being via problem-solving pondering (path ab) was also significant: $B = -0.02$, $p = 0.047$, $CI: [-0.04, -0.00]$. Thus, we found support for a mediation effect, but the negative impact of cognitive demands and of problem-solving pondering on well-being are opposite to the effects H3b predicted. High challenge stressors during a workday increased problem-solving pondering in the evening, in turn decreasing well-being the next morning.

H4a and H4b predicted that work-related affective rumination mediates the negative effect of emotional demands on entrepreneurs' well-being. Table 3 (bottom) shows that between-person emotional demands significantly increased between-person work-related affective rumination (path a). However, between-person work-related affective rumination did not significantly reduce well-being, $B = -0.31$, $p = 0.098$ (path b), and the indirect effect of emotional demands on well-being the next morning (path ab) was also not significant, $B = -0.16$, $p = 0.099$, $CI: [-0.34, 0.03]$. Thus, H4a is not supported.

As reported in Table 3 (bottom), at the within-person level we found a significant positive effect of emotional demands on affective rumination (path a) and a significant negative effect of affective rumination on well-being (path b). The indirect effect of day-specific emotional demands on well-being via work-related affective rumination in the evening (path ab) was also significant, $B = -0.04$, $p = 0.044$, $CI: [-0.08, -0.00]$, thus supporting the mediating effect proposed in H4b. High hindrance stressors during a workday increased work-related affective rumination in the evening, in turn decreasing well-being the next morning. The results are summarized in Fig. 2.

5.3. Robustness checks

We explored the curvilinear (inverse u-shaped) effects of cognitive demands on entrepreneurs' well-being at the between- and within-person levels. There may be an upper threshold for the positive effect of between-person cognitive demands (e.g., entrepreneurs who regularly work under extremely high cognitive demands). We tested a possible curvilinear relationship by including an additional quadratic term for between-person and within-person cognitive demands in the multilevel regression on well-being. These quadratic terms were not significant, and the likelihood ratio tests showed no significant improvement over the original model ($\Delta -2 \log = 1.25$, $\Delta df = 2$, $p = 0.534$).

We tested our final model on a smaller sample excluding 10 participants who, on some study days, may not have been in recovery

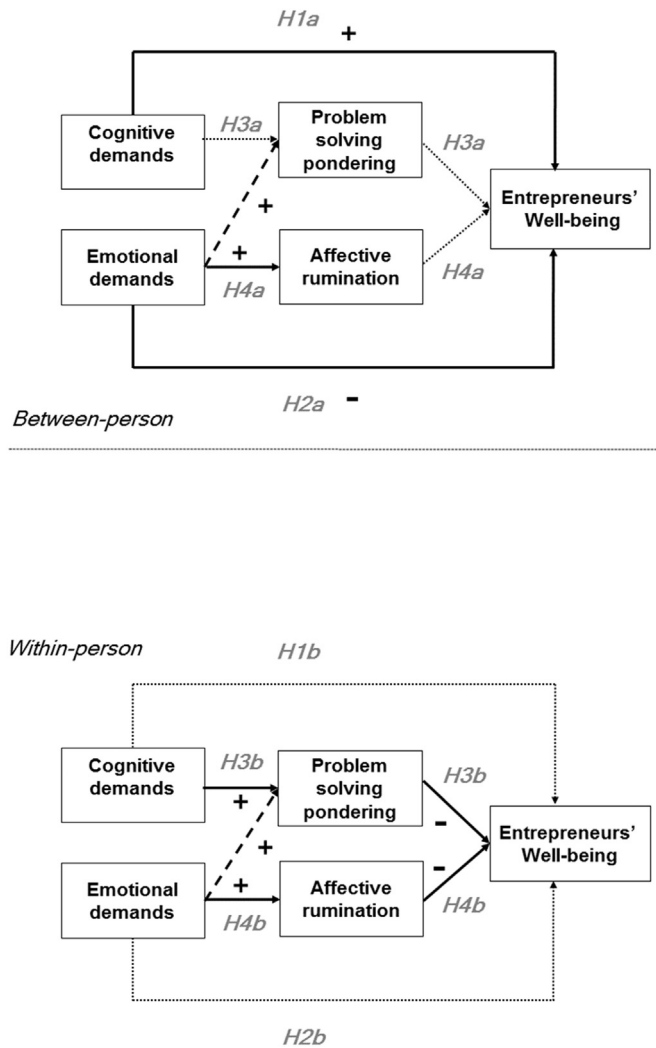


Fig. 2. Summary of findings at the between-person and within-person levels. Solid lines denote significant paths, dotted lines denote nonsignificant paths, and dashed lines denote additional paths found in the robustness check.

mode at the time of the evening interview: they were just about to finish work or planned to continue working afterward. The direction and pattern of our results remained unchanged. At the within-person level, the indirect effect of emotional demands on well-being via affective rumination changed slightly in its significance, from $p = 0.044$, $CI: [-0.08; -0.00]$ to $p = 0.053$, $CI: [-0.07; -0.0005]$. This change reflects lower statistical power in a considerably smaller sample ($N = 45$ vs. 55).

Furthermore, we tested an expansion of our research model (Fig. 1) to explore whether challenge stressors may also lead to affective rumination and hindrance stressors to problem-solving pondering. We thank two reviewers for this suggestion. We added paths from challenge stressors to affective rumination at between- and within-person levels. These additional paths were not significant, indicating that challenge stressors did not indirectly affect well-being via affective rumination at the between- and within-person levels. Next, we tested a further alternative model that specified an indirect effect of hindrance stressors on well-being via problem-solving pondering at the between- and within-person levels. The direct effect of hindrance stressors on problem-solving pondering was positive and significant at the within-person level, $B = 0.12$, $SE = 0.05$, $z = 2.46$, $p = 0.014$, $CI: [0.02, 0.22]$, and the between-person level, $B = 0.11$, $SE = 0.05$, $z = 1.98$, $p = 0.047$, $CI: [0.00, 0.21]$. The indirect effect of hindrance stressors on well-being via problem-solving pondering was negative and significant at the within-person level, $B = -0.02$, $SE = 0.01$, $z = 1.96$, $p = 0.050$, $CI: [-0.04; -0.00]$, but not significant at the between-person level, $B = 0.01$, $SE = 0.01$, $z = 0.87$, n.s. $CI: [-0.015, 0.0396]$. Introducing these additional paths did not change our existing results. Specifically, the indirect effect of emotional demands on well-being via affective rumination remained significant at the within-person level ($p = 0.044$) and the between-person level ($p = 0.099$), as Table 3 reports. The alternative model showed better fit than our hypothesized model ($LR \chi^2(2) = 9.92$, $p = 0.007$). Consequently, we added the paths from hindrance stressors (i.e., emotional demands) to problem-solving pondering to our final model (dashed lines in Fig. 2).

Finally, we re-ran our final model several times adding further control variables to account for sample characteristics. We

controlled for the age of the entrepreneur's firm by: (a) established (≥ 3.5 years) vs. newly founded (< 3.5 years); and (b) active in the market for more vs. less than five years. We also controlled for whether the firm had employees or the entrepreneur was self-employed. These control variables were unrelated to our outcome variable and adding them did not change the pattern, direction, or size of the reported effects.

6. Discussion

This study advances understanding of entrepreneurs' stress and well-being by drawing attention to diverse stressors and highlighting psychological detachment as a key mechanism through which entrepreneurs' stressors influence their well-being. Our multilevel diary design offers unique insights from a micro-foundational perspective.

6.1. Advancing understanding of entrepreneurs' work stressors

Our study highlights the different types of stressors for entrepreneurs and conceptualizes them by introducing to entrepreneurship research the challenge-hindrane stressor framework (LePine et al., 2005). This advances understanding of entrepreneurs' work stressors by nuancing past research that considers only workload and work intensity, and complements the dominant view that all stressors are “bad” for entrepreneurs' well-being (e.g., Stephan, 2018). For instance, we document that cognitive demands as challenge stressors can enhance entrepreneurs' well-being over time (at the between-person level). This elucidates why entrepreneurs can experience high well-being despite high levels of work stressors.

However, unlike in employee research (for a daily study, see Baethge et al., 2018), we found that challenge stressors had short-term negative—instead of the expected positive—effects on well-being. We believe this finding highlights the unique nature of entrepreneurs' work. Given their overall high and persistent levels of stress, particularly challenging days can induce exhaustion and “overload” entrepreneurs' recovery resources. Daily spikes on top of already high cognitive demands likely evoke extensive problem-solving pondering that no longer leads to problem solutions, making it difficult to appreciate a possible upside of challenge stressors in terms of goal progress. Entrepreneurs will instead feel “stuck” and experience strain when expending mental energy on repetitively considering the same problem. By contrast, for a typical employee, a challenging day may be exceptional, allowing them to appreciate the upside of intense work and engage in constructive problem-solving pondering that evening. Conversely, we find an average positive effect of challenge stressors over time at the between-person level, in line with the notion that entrepreneurs “know what they work for” and gain well-being from challenging work that allows them to realize business goals.

In sum, our results suggest that the same stressor can act as a challenge or hindrance stressor, depending on the sample (entrepreneurs vs. employees), analysis level (between- vs. within-person), and time perspective (effects aggregated over time vs. short-term day-to-day effects). Future work is needed to understand how entrepreneurs make challenge and hindrance appraisals, and how these relate to work outcomes such as performance, creativity, and motivation to well-being. Research should also explore the sources of challenge and hindrance stressors. For instance, what are the roles of external and internal influences such as market conditions or entrepreneurs' approach to structuring and “crafting” their work?

Our results also draw new attention to the critical role of hindrance stressors, specifically emotional demands. Emotional demands impaired entrepreneurs' well-being directly at the between-person level and indirectly via increasing perseverative thinking at the within-person level. Moreover, in contrast to employee research (see meta-analysis by Bennett et al., 2018; Van Laethem et al., 2019), hindrance stressors (not challenge stressors) had stronger negative effects on recovery. Given this importance of hindrance stressors in the entrepreneurial work setting, future research should theoretically and empirically consider the emotional stressors arising from entrepreneurial work. Such research can draw on rich insight on the importance of emotions for understanding a range of other entrepreneurial processes (Cardon et al., 2009; Foo et al., 2009; Gielnik et al., 2015; Jenkins et al., 2014; Shepherd, 2003; Uy et al., 2017). Our study highlighted interpersonal interactions that are core to entrepreneurs' work as relevant emotional hindrance stressors; other hindrance stressors specific to entrepreneurs, such as bankruptcy risk or employee illness, need research attention.

6.2. The role of recovery and psychological detachment for entrepreneurs' well-being

Our study complements, reinforces, and extends emerging research on the role of recovery for entrepreneurs' well-being (Gunnarsson and Josephson, 2011; Kollmann et al., 2019; Taris et al., 2008; Weinberger et al., 2018; Williamson et al., 2019) by building on the stressor-detachment model (Sonnentag and Fritz, 2015). Overall, our findings highlight the unique role of psychological recovery for entrepreneurs' well-being, which is unsettled by continued perseverative thinking about work (problem-solving pondering and affective rumination). Our results are strengthened by our diary research design and controlling for sleep efficiency as an indicator of physiological recovery.

Our study introduces two distinct recovery-impeding experiences (problem-solving pondering and work-related affective rumination) that are respectively related to cognitive and emotional stress processes. Our findings confirm that both experiences impair daily well-being in the short term. Regarding affective rumination, our results align with prior findings that impaired detachment from work stressors diminishes well-being. Yet our results for problem-solving pondering are counter to our expectation. We had assumed that problem-solving pondering would benefit entrepreneurs' well-being in the short-term, as documented in research on employees (Firoozabadi et al., 2018; Syrek et al., 2017).

Complementing existing accounts of entrepreneurs as highly resilient and stress-resistant individuals who easily cope with entrepreneurial work demands (e.g., Baron et al., 2016), our results suggest that entrepreneurs' recovery capacity can easily be

“overloaded” on days with high levels of challenge or hindrance stressors. These findings seem consistent with the view that entrepreneurs care deeply about their work, as part of their identity (e.g., Cardon et al., 2009). They, therefore, work very hard and find it difficult to detach from their work in the evening, which impedes their recovery from work stress and, in turn, diminishes well-being.

Despite our finding that impaired psychological detachment negatively impacts on well-being, psychological detachment can be a double-edged sword for entrepreneurs. Increased problem-solving pondering and a lack of detachment may impair recovery and diminish well-being in the short-term (as shown in our study), but may also enhance performance at the between-person level. For instance, Weinberger et al. (2018) reported that entrepreneurs who typically engaged in more problem-solving pondering (i.e., detached less from work) had more creative ideas. Similarly, meta-analytic findings from employee research show that lack of detachment relates positively to creativity, innovative behaviors, and helping others at work (Wendsche and Lohmann-Haislah, 2017). The possible trade-offs inherent in entrepreneurs' recovery experiences need further exploration, to ascertain when and how they positively influence both performance and well-being.

6.3. Toward more time-sensitive theorizing on entrepreneurs' well-being

Our study's design and findings highlight the importance of accounting for different analysis levels and temporal perspectives (Lévesque and Stephan, 2020) when theorizing on entrepreneurs' well-being (Wiklund et al., 2019). Specifically, it is worthwhile considering the within-person level, which captures short-term processes from one day to the next, alongside the between-person level, which captures average relationships across entrepreneurs aggregated over time (McCormick et al., 2018). Our findings point to some unique theoretical processes across these two levels. The mediating effects of impaired detachment between stressors and well-being were only detected on the day level. This highlights the value of developing a short-term micro-foundational perspective on entrepreneurs' stress and well-being, and contrasting it directly with the much more common between-person-level perspective.

Current research on entrepreneurs' well-being is dominated by cross-sectional studies comparing entrepreneurs and thus emphasizing between-person effects (Stephan, 2018). Yet such research risks masking important micro-level processes such as in recovery (McCormick et al., 2018; Sonnentag and Lischetzke, 2018; Sonnentag et al., 2017). Moreover, there was more within- than between-person variation in all our study constructs, and more within-person variation than has been documented in employee research (McCormick et al., 2018). This reinforces arguments that the greater uncertainty faced by entrepreneurs is reflected in higher variability of work characteristics and well-being (Stephan, 2018), which makes diary research on entrepreneurs' stress and well-being a powerful yet still underutilized tool to advance entrepreneurship theory (Uy et al., 2010). Future research should exploit the possibilities of diary studies more fully to develop time-sensitive theory on entrepreneurs' well-being, and to pursue opportunities for multilevel theory building by testing parallel theoretical processes at the within- and between-person levels (McCormick et al., 2018; Sonnentag et al., 2017).

6.4. Limitations and future research directions

Notwithstanding our study's several strengths, particularly the longitudinal diary design that allowed us to analyze effect directionality, it also has limitations. First, we rely on self-reported data, as is common in diary and daily studies (Foo et al., 2009; Uy et al., 2015). This aligns with our interest in studying entrepreneurs' subjective experience of their work stressors, perseverative thinking, and well-being. Stressors that are not subjectively experienced as demanding by entrepreneurs are less likely to influence their well-being, no matter how objectively cumbersome they may appear to other people. Moreover, entrepreneurs' subjective experience of well-being is related to objective outcomes such as persistence and firm performance (Stephan, 2018; Wincnet et al., 2008). Nevertheless, future entrepreneurship research should break new ground by combining subjective and objective measures of stressors. Other novel research avenues include triangulating entrepreneurs' well-being with perceptions from their partners, colleagues, and spouses, and expanding the investigation of well-being to objective health indicators (e.g., ambulatory blood pressure, heart rate, or physical illnesses).

Second, we used a convenience sample of entrepreneurs from Saxony in Germany, potentially limiting the generalizability of our results. Compared to a representative sample of German entrepreneurs from the European Social Survey (ESS), our sample was younger ($M_{\text{Study}} = 40.56$ vs. $M_{\text{ESS}} = 50.76$, $N_{\text{ESS}} = 208$) and had more males (85.5% vs. 72.5%_{ESS}, $N_{\text{ESS}} = 209$). Our sample included mainly “everyday” entrepreneurs operating in established and less growth- and high-tech-oriented firms (Welter et al., 2017), in contrast to the dominant focus on the “Silicon Valley model of entrepreneurship” and high impact ventures, i.e., “gazelles” and “unicorns” (Aldrich and Ruef, 2018). Our insights thereby complement past research using experience sampling methods, which have focused especially on entrepreneurs in the pre-launch phase or based in business incubators (Foo et al., 2009; Uy et al., 2017).

Third, reliability was moderate for the emotional ($\alpha = 0.60$) and cognitive ($\alpha = 0.67$) demands, as we used two-item scales to limit participants' effort. This approach is common in diary studies, including on entrepreneurs (Foo et al., 2009; Gielnik et al., 2015; Uy et al., 2015; Uy et al., 2010). Cronbach's alpha is known to decrease with the number of items (Cortina, 1993), and we found good construct validity in our factor analyses. In fact, our results may be a conservative test of the effects of stressors on perseverative thinking and well-being, because scale unreliability lowers the chances of finding significant relationships. Nevertheless, future research may consider longer scales.

Finally, we analyzed lagged relationships (stressors and detachment on day d and well-being on day $d + 1$) and also controlled for the autocorrelation of the dependent variable (daily well-being). This allows us to draw conclusions on the direction of effects, i.e., that work stressors and perseverative thinking influence well-being. However, additional reverse processes may exist (Sonnentag,

2015). For instance, on a given day, reduced well-being might affect entrepreneurs' perception of work stressors, triggering spirals of increasing or decreasing well-being over weeks and months (Hobfoll, 2002). Future studies could address such relationships and might also explore how within- and between-person level stressors interact across levels. For instance, how do day-specific stressors develop over longer time spans of several weeks or months? Entrepreneurs may be able to compensate for a certain frequency, intensity, or pattern of day-specific spikes in intense work demands. However, a steady increase may lead to chronic health problems (Dhabhar, 2018).

Our study also has implications for future research. First, organizational behavior studies typically relate the challenge-hindrance stressor framework to indicators of negative well-being such as strain, depression, anxiety, or health complaints (LePine et al., 2005). Our study expands this research by considering the outcome of positive well-being. Future research may take a broader view of entrepreneurs' well-being by distinguishing hedonic and eudaimonic well-being, the latter referring to the "realization of personal potential, purposeful life engagement, effective management of complex environment" (Ryff, 2019, p. 646). As current strains that pave the way to future accomplishment, forward-looking challenge stressors might be especially closely linked to entrepreneurs' eudaimonic well-being. To capture the ambivalence inherent in challenge stressors (Webster et al., 2011; Widmer et al., 2012), future research should study their effects on entrepreneurs' positive and negative well-being simultaneously.

Second, future studies could incorporate and theorize more fully how entrepreneurs' personal characteristics impact stress processes, such as in learning to deal with stress (Rauch et al., 2018). For example, entrepreneurs are often characterized by high trait positive affect (Baron et al., 2012), self-efficacy (Bradley and Roberts, 2004), and psychological capital (Baron et al., 2016). These personality traits and the experience of passion (Cardon et al., 2009) may help to buffer stressors' detrimental effects on well-being. However, passion may be a doubtful advantage since it may also inhibit detachment from work by increasing perseverative thinking (Spivack et al., 2014; Taris et al., 2008).

Finally, we suggest some future research avenues to advance understanding of entrepreneurs' recovery. First, qualitative studies could be conducted to identify the recovery strategies entrepreneurs use. Second, quantitative research could expand the scope of the detachment strategies investigated from physical activity, socializing, and sleep to weekends off and vacations. Such research should include measures of how rested entrepreneurs felt after recovery activities. Third, studies could investigate how the organization of work itself, such as frequent and scheduled (short) rest breaks throughout the workday, may aid recovery at work (for a meta-analysis on breaks for employees, see Wendsche et al., 2016). Considering the intensity of entrepreneurs' work and their strong attachment to it, short rest breaks may be particularly beneficial for recovery, while also perhaps allowing them to "gain perspective" and stimulating their creativity.

6.5. Implications for practice

Our findings offer insight on how entrepreneurs could deal with work stressors to maintain high well-being. They may design their work to avoid or reduce day-specific spikes of intense cognitive demands. They may also anticipate high demands arising from approaching deadlines, additional orders, or the year-end tax return by delegating parts of this work to employees or outsourcing it to third parties. Regarding emotional demands, entrepreneurs may seek training to enhance their abilities to self-regulate emotions and develop conflict-management strategies (e.g., Leon-Perez et al., 2016). They could also apply emotion-focused coping strategies such as seeking emotional support (Patzelt and Shepherd, 2011; Uy et al., 2013).

As entrepreneurs' jobs are highly uncertain and demanding, it might be difficult to alleviate their high levels of work stressors. Instead, they might reduce the negative impact of work stressors on their well-being by striving to completely mentally disengage from their work during non-work time to facilitate recovery. Our study suggests that any type of continued psychological engagement with work impairs entrepreneurs' well-being. Thus, psychological detachment from work seems a powerful approach for entrepreneurs to maintain high well-being. Possible strategies include engaging in absorbing leisure activities (Casper and Sonnentag, 2020), meditation and mindfulness (Hülshager et al., 2014), and physical exercise and socializing (Granath et al., 2006; Sonnentag and Fritz, 2007). Nevertheless, it might be tough for entrepreneurs to stop work-related perseverative thinking in the evening. They may try to turn perseverative thinking into reflection on the positive aspects of their work (cf. Daniel and Sonnentag, 2014). Such positive reflection might allow reappraisal of stressful work situations, potentially leading to stress reduction (Lazarus, 1991).

Finally, entrepreneurs' mentors, coaches, and board members should encourage them to care for their well-being and to make time for recovery to protect it. Ultimately, entrepreneurs' well-being is a driver of firm performance (Stephan, 2018).

7. Conclusion

This study offers new insights into entrepreneurs' stress and well-being. By building on the stressor-detachment model (Sonnentag and Fritz, 2015), it highlights impaired psychological detachment and recovery processes as a key mechanism through which stressors influence well-being. It also introduces the differentiation of challenge and hindrance stressors (LePine et al., 2005) to research on entrepreneurs' well-being, and finds distinct negative but also positive effects of stressors on well-being. Moreover, our multilevel diary design offers unique insights from a micro-foundational, day-to-day, within-person perspective to the research on entrepreneurs' stressors and well-being. This approach complements the between-person perspective dominating research on entrepreneurs' well-being to date.

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Author statement

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