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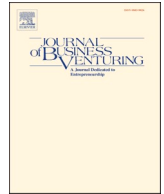
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Job burnout and work engagement in entrepreneurs: How the psychological utility of entrepreneurship drives healthy engagement

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ABSTRACT

What is the real value of entrepreneurship? We propose a framework of psychological utility by integrating Job Demands-Resources (JD-R) theory with a recovery approach from a personal agency perspective. We hypothesize that personal agency together with the positive JD-R pattern of entrepreneurship generates outstanding psychological utility, which maintains and rewards a healthy, strong work engagement that spills over to off-work time. This benefits entrepreneurs, but also their businesses reliant on strong work engagement that avoids burnout. We validate our framework by means of panel data comprising four waves (348 entrepreneurs and 1002 employees), where we also analyze different types of entrepreneurs.

1. Introduction

Since the outset of entrepreneurship research, the wider positive contributions of entrepreneurs to the economy have been frequently highlighted (e.g., regarding job creation, innovation, industry evolution, or growth; see Audretsch, 1995; Haltiwanger et al., 2013; Schumpeter, 1934). However, the value of entrepreneurship may also lie in benefits that accrue to the individual entrepreneurs themselves—the individual payoff to entrepreneurship as personal utility (Baumol, 1990; Douglas and Shepherd, 2002; Lévesque et al., 2002; Van Praag and Versloot, 2007). Despite its prominent role particularly in economics, personal utility is still often referred to as a black box (Kahneman et al., 1997; Kahneman and Thaler, 1991; Kaplan and Schulhofer-Wohl, 2018).

This black box of personal utility in the context of entrepreneurship is important to unpick since such utility should have particularly important implications for entrepreneurs' persisting motivation and personal well-being as well as their businesses.

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Entrepreneurs might not only accrue such benefits as passive recipients, but also proactively, as intentional agents in their own positive development (Bandura, 1989; Heckhausen and Schulz, 1995; Lerner and Busch-Rossnagel, 1981), where entrepreneurship is an instrument to maximize the utility of work via personal agency (Douglas and Shepherd, 2000; Frese, 2009). Hence, to the extent that individuals are motivated to maximize and realize their own utility via personal agency (Simon, 2000), we argue that entrepreneurs, compared to non-entrepreneurs, derive outstanding personal utility¹ proactively from their work. The actual personal utility of entrepreneurial work has been subject to ongoing debate, particularly with respect to underlying psychological processes (Benz and Frey, 2008; Douglas and Shepherd, 2000; Lévesque et al., 2002; Monsen et al., 2010; Shane, 2008; Van Praag and Versloot, 2007).

Two often used perspectives to approach personal utility are the economic versus the psychological lens (Kaplan and Schulhofer-Wohl, 2018). On the one hand, *economic* (or financial) personal utility focuses on the economic value of work. Some entrepreneurship studies have shown, however, that “the majority of entrepreneurs would earn higher incomes as wage employees” (Van Praag and Versloot, 2007, p. 377; but for a critical view, see also Åstebro and Chen, 2014), suggesting that the economic benefits of entrepreneurship are often not much better (or perhaps even less) than in comparable employed work. Thus, entrepreneurship might offer other types of personal utility, otherwise entrepreneurship as a career choice and everyday work role should be rather less popular and personally satisfying than it is (Benz and Frey, 2008).

On the other hand, to go beyond such ‘simple utility’ (Monsen et al., 2010), entrepreneurship scholars have begun to focus on non-economic (non-financial) personal utility—a phenomenon we can summarize as *psychological utility*. Compared to the traditional economic model (Robinson, 1962), newer interpretations of the utility concept seek to integrate latest insights from psychology to derive a more psychologically realistic understanding of utility, which also considers the subjectivity and complexity of individual psychological processes, and thus the boundaries of rationality (Kahneman and Thaler, 1991; Kahneman et al., 1997; Simon, 2000). While integrating psychological insights into utility models has been highlighted as one of the “most compelling and influential” (Loewenstein, 1999, p. 315) contributions of psychology to economics, contemporary utility-focused entrepreneurship research has yet to witness a deeper integration of recent psychological insights.

Applying a focus on *positive* potential and outcomes for an entrepreneur, psychological utility can be understood, conceptualized, and researched from a positive psychology perspective—“a science of positive subjective experience, positive individual traits, and positive institutions [that] promises to improve quality of life and prevent [...] pathologies” (Seligman and Csikszentmihalyi, 2000, p. 5). From this perspective, and consistent with previous discussions in entrepreneurship research, we define the psychological utility of entrepreneurship as *the entrepreneur's positive subjective experience (while avoiding negative psychological outcomes) as return to their own work engagement, positive traits, and a positive institutional environment, and in contrast to non-entrepreneurial work*. In other words, such utility covers not only the mere psychological rewards and benefits of own entrepreneurship (Kaplan and Schulhofer-Wohl, 2018), but places them into perspective in comparison to own, on-going investments into an entrepreneurial career (the psychological payoffs to this investment), also as juxtaposed to other career options and types of work (e.g., employed work; Goethner et al., 2012).

Highlighting such psychological utility that contrasts a more traditional understanding of utility is something that urgently has been called for in the entrepreneurship literature. In fact, a growing body of conceptual and empirical work has emphasized outcome-oriented psychological factors, such as job satisfaction or happiness (e.g., Stephan, 2018; Wiklund et al., 2019; Van Praag and Versloot, 2007) as well as expected/anticipated utility shaping the choice for an entrepreneurial career (Douglas and Shepherd, 2000, 2002). Despite this research interest, our knowledge of the complex psychological utility processes (e.g., with respect to the mechanisms leading to such experienced outcomes, and *how* entrepreneurs can actually maximize psychological utility) remains limited. A notable exemption is Benz and Frey's (2008) work on procedural utility—the utility entrepreneurs derive from the process of decision making—and *how* instrumental outcomes are generated in entrepreneurship (see also Frey et al., 2004).

Here we address the *experienced* psychological utility of entrepreneurship and the underlying processes that indicate *how* entrepreneurs maximize such utility. Consistent with our definition of psychological utility, we develop a testable model, combining a stress and motivation model, the Job Demands-Resources (JD-R) theory (Bakker et al., 2014; Demerouti et al., 2001), with a work recovery approach (Bennett et al., 2018; Sonnentag et al., 2022). It is important to note, however, that we do not claim this to be the only way of advancing our understanding of the psychological utility of entrepreneurship, which, by its very nature, should be highly complex.² At its core this approach enables us to investigate an intriguing psychological mechanism, that is, how entrepreneurs seem unconcerned by burnout risks or their strong work engagement. We show that this mechanism may form the core for our understanding of the high psychological utility that entrepreneurs proactively derive from work.

Entrepreneurship scholars have recently called for conceptual and empirical research that captures the complexity of motivation and stress processes specific to entrepreneurial work (Nikolaev et al., 2020; Stephan, 2018; Wiklund et al., 2019), also with an eye to the practical implications — asking, for example, how entrepreneurs can avoid negative, and maximize positive, psychological work outcomes. There has also been a recent call to investigate eudaimonic well-being in entrepreneurs (e.g., as compared to hedonic well-being), which emphasizes personal agency and related “multiple facets of well-being such as purposeful engagement, realization of personal potential, autonomy, mastery, quality ties to others, and self-acceptance” (Ryff, 2019, p. 647). The model we develop is based upon key characteristics of how entrepreneurs can avoid negative, and maximize positive, psychological outcomes.

¹ In this paper, utility is understood as the *actually experienced* utility while working as an entrepreneur, as opposed to *expected future* utility, relevant for example for occupational choice processes (Kahneman et al., 1997).

² A common emphasis in economic research is that utility is a black box, rendering this a phenomenon that is rather complex and difficult to directly measure and test (Kahneman et al., 1997; Kahneman and Thaler, 1991; Robinson, 1962). With the integration of testable, concrete psychological models and concepts it becomes possible to break this complexity down (Simon, 2000). We regard our study as one such example.

We present original panel survey data comprising four waves collected at two-month intervals (348 entrepreneurs and 1002 employees). Our results confirm the notion that entrepreneurship offers better psychological utility than employed work because it represents a more positive JD-R pattern (positive, energizing motivation activation pattern outweighing a negative, depleting stress process). We also find that entrepreneurs show higher work engagement than employees, interpretable as an agentic utility maximization process (investments in a positive JD-R job setting that offers outstanding utility). In the same vein, entrepreneurs indeed engage less in traditional off-work recovery via psychological detachment, which might place them at risk for burnout; yet they are protected by the positive JD-R pattern and also conserve maximized psychological utility derived from entrepreneurial work (by avoiding specific costs). Finally, we establish that, within the entrepreneurial population, it is the solo entrepreneurs that particularly benefit from high psychological utility.

Taken together, our findings advance scholarly knowledge in three ways. First, our overall contribution proffers new theoretical and empirical insights into the complex psychological utility of entrepreneurship and its underlying mechanisms, and how entrepreneurs can, and do, actually maximize such utility offered by their work—an important research gap in contemporary entrepreneurship research, as stressed above. The second (nested) type of contributions represents specific insights into a psychological mechanism of entrepreneurial stress, motivation, and recovery. We provide novel and robust empirical evidence on the scope and prevalence of work engagement and job burnout in entrepreneurs, as well as its underlying mechanisms (as compared to employed individuals). By combining JD-R theory with the recovery approach to illuminate how motivational and stress processes operate holistically in entrepreneurs we also contribute to the small but growing research on the role of recovery in preventing ill-being and promoting well-being in entrepreneurs (Wach et al., 2021; Williamson et al., 2021). Finally, our third type of contribution lies in a more nuanced understanding of the heterogeneity of entrepreneurs and its implications for psychological utility (such as solo entrepreneurs vs. employer entrepreneurs, but also novice vs. serial entrepreneurs, young vs. mature firms, and firms of different sizes). Although this ‘heterogeneity challenge’ has been frequently highlighted in entrepreneurship research, it nevertheless remains but seldomly addressed by means of study designs that attempt to account for it (Davidsson, 2016).

2. Theoretical framework and hypotheses development

We begin with our psychological utility framework (Fig. 1), which guided us to develop the concrete hypotheses that break down stress, motivation, and recovery processes, and which together are indicative of psychological utility (Fig. 2). In combination these hypotheses explain why, and how, entrepreneurs maintain a healthy high work engagement and derive outstanding psychological utility.

2.1. Personal agency and engagement as the epitome of entrepreneurship: maximizing utility or risk for negative outcomes?

One foundation of our utility framework draws from the personal agency paradigm in psychology (Bandura, 1989; Heckhausen and Schulz, 1995), which emphasizes that individuals typically seek and thrive on personal control and mastery in challenging task environments (such as entrepreneurship), thereby in turn resulting in better performance of these challenging tasks. Successful entrepreneurship relies on the personal agency of an individual entrepreneur—the strong and persistent motivation to engage in their daily work, be it to start, run, or grow a business, and the individual freedom and autonomy to make own choices and regulate own entrepreneurial actions (Frese, 2009; Shane et al., 2003). Entrepreneurs typically need to engage in a wide variety of work tasks (Lazear, 2005), while often being psychologically ‘on alert’ on a continual basis to stay in control of concrete operational issues and deal with uncertainty, risk, and contingency, even while remaining open to new opportunities (Tang et al., 2012). Hence, it is not surprising that a myriad of entrepreneurship theories and studies highlight the role of personal agency (e.g., Frese, 2009; Newman et al., 2019; Shane et al., 2003).³ In addition, and in light of the importance of such a continual engagement in a complex task environment, scholars have emphasized energizing processes as essential components for entrepreneurs to be able to function psychologically and to be ‘in control’ (Stephan, 2018; Shir and Ryff, 2021; Wiklund et al., 2019), as shown for example in prior research on entrepreneurial passion (Cardon et al., 2009; Stroe et al., 2018).

Debate has ensued, however, over whether personal agency and the strong and persistent engagement—fueled by motivation processes—could also come at significant psychological costs for entrepreneurs, such as high stress/burnout (Baron et al., 2016; Fernet et al., 2016; Hessels et al., 2017; Kollmann et al., 2019; see also Lerman et al., 2021). In the occupational health literature, over-engagement and strong, persisting work passion have been linked to the risk of burnout, for instance due to conflict with other life activities and a lack of recovery (Sonnentag et al., 2022; Sonnentag and Fritz, 2015; Vallerand et al., 2010). Since such work engagement requires significant self-regulation, the psychological resources driving such self-regulation deplete over time (Muraven and Baumeister, 2000), thereby potentially impeding entrepreneurs' ability to function psychologically (Nikolaev et al., 2020). Moreover, the detrimental effect of stressors that might be prevalent in entrepreneurial work (Lerman et al., 2021; Stephan, 2018) may be amplified through strong and persistent work engagement, particularly if recovery processes are impaired (Sonnentag and Fritz, 2015). Indeed, some studies indicate that “entrepreneurs have stressful jobs—high work demands that require intense effort and concentration” (Stephan, 2018, p. 296; see also Lerman et al., 2021; Palmer et al., 2021; Wei et al., 2015). Work and occupational health experts describe entrepreneurs' working conditions as “characterized by long working hours and the potential for stress and

³ However, to the best of our knowledge such an agency perspective to date has not been prominently applied in psychological utility-focused entrepreneurship research.

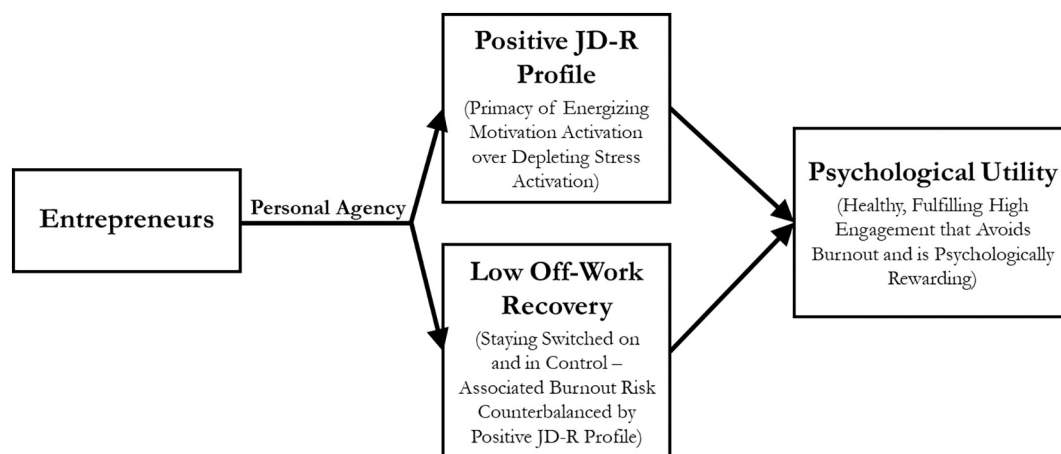


Fig. 1. Psychological utility framework: How entrepreneurs proactively derive psychological utility via high work engagement (investing engagement in work offering a positive, energizing, and rewarding JD-R profile job), which also spills over to non-work time.

health-related issues" (OECD, 2017, p. 110).

However, a very different story is told by research indicating that entrepreneurs experience less, and not more, stress than non-entrepreneurs (Baron et al., 2016; Hessels et al., 2017). Here we build on this positive view, by stressing that personal agency in entrepreneurship does not only drive the entrepreneurial process as the 'engine room', but is also a mechanism by which entrepreneurs maximize psychological utility: the personal agency of entrepreneurs as the freedom and intrinsic driver to reap, protect, and maximize psychological utility offered by their job. These two positive roles of personal agency in entrepreneurs (i.e., the 'engine room' effect beneficial for their businesses, and the utility maximization beneficial for themselves) represent two sides of the same coin, possibly also reinforcing each other. For example, more work engagement to build, run, and grow the business can be accompanied by more psychological utility,⁴ which in turn incentivizes continued strong work engagement.

Guided by our agency-based psychological utility framework (Fig. 1), we identify two pathways by which personal agency is linked to psychological utility in entrepreneurs. First, entrepreneurs' personal agency drives their continuous work engagement in the context of the specific demands and resources associated with their job. Second, it also fuels their psychological engagement during off-work time (associated with a lack of off-work recovery) in a sense that it protects psychological utility, as explained in the following.

Our guiding framework (see Fig. 1) represents the overall, novel theoretical rationale for our study, from which we derive a concrete research model that combines a motivation and stress theory (JD-R theory) with a recovery approach. It is this research model, in its totality, that enables submitting our utility framework to a concrete empirical examination. While our guiding framework represents the overall, novel theoretical rationale for our study, with its holistic emphasis on the integration of motivation, stress, and recovery factors and mechanisms, in the following we also deem it important to launch our hypotheses development with a discussion of the JD-R theory and the work recovery approach. This is also pertinent because particularly the JD-R theory itself has yet to be introduced properly in the entrepreneurship literature.⁵

2.2. The Job Demands-Resources (JD-R) theory

JD-R theory is usually understood as an integrated theory of occupational motivation and stress (Bakker et al., 2014). With its dual focus on avoiding negative outcomes (e.g., burnout) and promoting positive ones (such as energized, healthy work engagement), JD-R theory cleaves to the logic of positive psychology to address psychological utility (Seligman and Csikszentmihalyi, 2000; see also Sweetman and Luthans, 2010), and has become one of the most influential theories relating to job performance, motivation, and well- and ill-being at work (Bakker et al., 2014).

To date, JD-R theory has been applied in numerous occupational health and performance studies. For example, currently JD-R theory helps to explain, describe, and make predictions about employee burnout, work engagement, and various aspects of job performance (e.g., efficiency and productivity), motivational outcomes (e.g., learning and proactive behavior), and health-related outcomes (e.g., depression and anxiety disorders, and absenteeism due to illness) (Bakker et al., 2014; Bakker and Demerouti, 2017). There is clear evidence from prior occupational health research on the need to conceptualize and research motivation and stress processes in an integrative (and at the same time parsimonious) manner (Bakker and Demerouti, 2017). A myriad of research has

⁴ Due to the personal investments (=high work engagement) in a job setting that represents a positive JD-R pattern, and because of positive spillover processes of healthy high engagement to non-work time (see Fig. 1).

⁵ At first glance, it might seem that such an isolated focus on JD-R theory and the work recovery approach in the following sections distracts from the psychological utility focus of this study. We deem it essential, however, to provide these separate overviews as this allows readers to understand our framework and derived research model better.

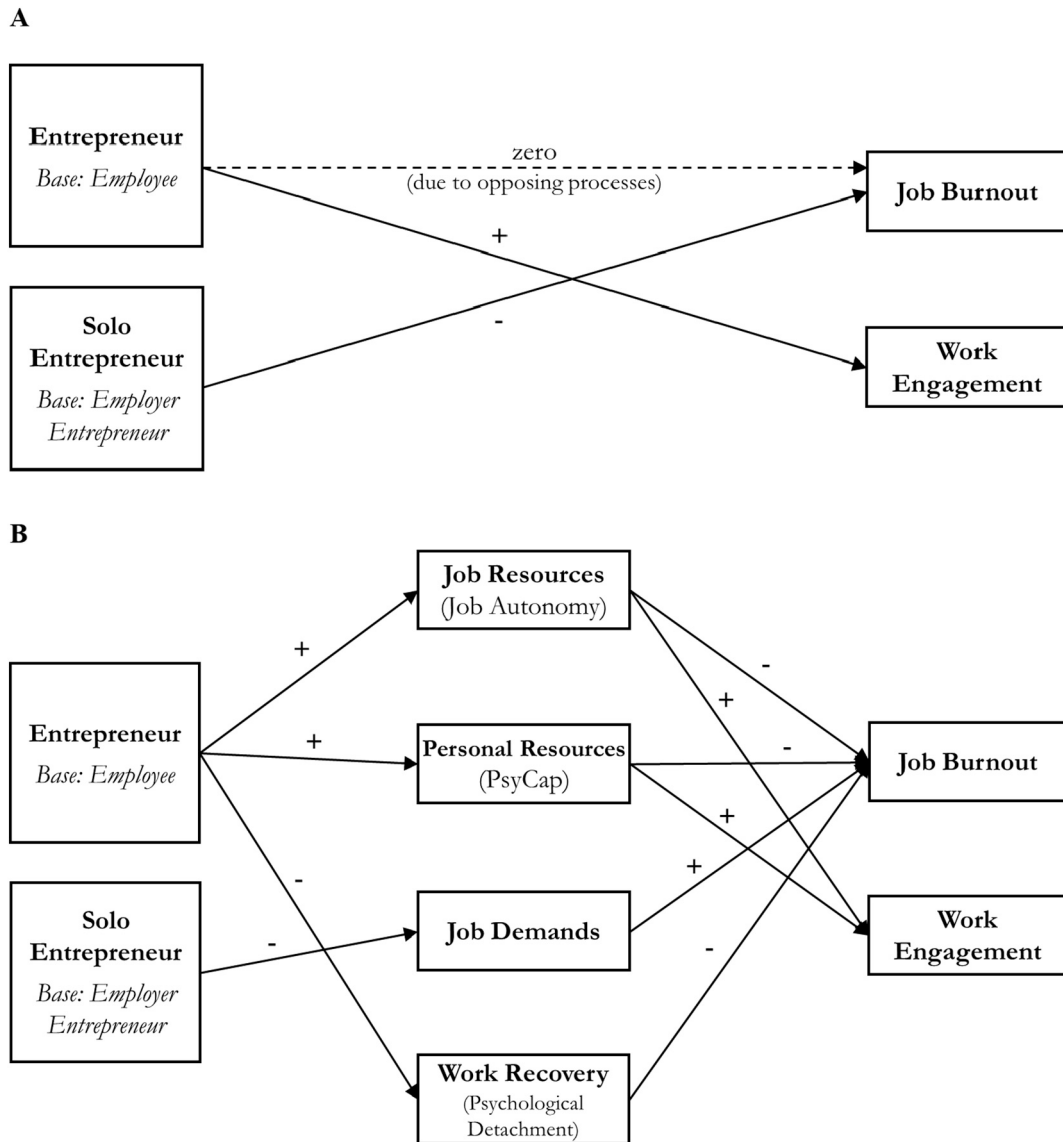


Fig. 2. Research model: hypothesized effects with direct paths (A) and mediation paths (B).

Note: Entrepreneurship (being an entrepreneur, as opposed to being an employee) does not have a direct effect on burnout (A), but this is due to the positive indirect effect of work recovery and the negative indirect effect of job and personal resources (B). The dashed line represents a null effect; the solid lines represent a positive (+) or negative (–) effect.

shown that such a dual-process view can help uncover the complex drivers of motivation and stress (as well as well- and ill-being) specific to certain occupations and types of jobs, such as those in which strong work engagement entails an elevated threat of burnout, e.g., for nurses (Van der Colff and Rothmann, 2009), teachers (Hakanen et al., 2006), or police officers (Hu et al., 2017).

Previous entrepreneurship research has already targeted individual (yet isolated) components of JD-R theory, such as job demands (e.g., Lerman et al., 2021), job resources (e.g., Hessels et al., 2017), and personal resources (e.g., Baron et al., 2016), yet there is a lack of both an integrative model and an integrative empirical test. Integrating such determinants and processes is vital for reflecting the complexity of well-being and motivation (Nikolaev et al., 2020). Moreover, this also enables researchers to examine the additional variance in the outcome variables that is explained by each determinant and process (Kautonen et al., 2015).

2.2.1. Job burnout and work engagement as central outcomes

Two central outcomes in JD-R theory are job burnout and work engagement. Job burnout is defined as “a prolonged response to chronic emotional and interpersonal stressors on the job” (Maslach, 2003, p. 189) and is expressed by feelings of exhaustion, cynicism, and a sense of inefficacy (Maslach et al., 2001). Exhaustion is characterized by strain and overtaxing from work; cynicism is described as a loss of interest and distal attitude to work (e.g., not appreciating work as meaningful); and feelings of inefficacy are often

characterized by a sense of incompetence (Schaufeli et al., 2002). Burnout can affect both physical and mental health, with far-reaching consequences for individuals. Workers with high levels of job burnout tend to be physically, mentally, and emotionally exhausted when performing their tasks; hence, they are less effective at accomplishing their goals and show lower levels of well-being and job performance (Bakker et al., 2008; Taris, 2006). The WHO (2019) acknowledges burnout in the 11th Revision of the International Classification of Diseases (ICD-11) as an occupational phenomenon (rather than medical condition). However, is job burnout a commonplace phenomenon in entrepreneurs? The notion that burnout levels do differ across occupations has been well supported in the literature (Schutte et al., 2000). While job burnout has become an important topic in business research over the past decades (Cordes and Dougherty, 1993), burnout among entrepreneurs has been studied less exhaustively than in the context of other occupations (Mäkinen et al., 2020; Wei et al., 2015); and the limited number of studies present mixed and inconclusive evidence. In our model we define the absence of burnout (e.g., despite continuously high work engagement) as a necessary condition for psychological utility.

Work engagement, in turn, is described as a positive, fulfilling work-focused mental state. Thus, such a focus on work engagement follows a positive psychology perspective (Sweetman and Luthans, 2010). Cardinal indicators of work engagement are high levels of vigor, dedication, and absorption (Bakker, 2011; Schaufeli et al., 2006). Vigor refers to high levels of energy and mental resilience while working, as well as the desire to invest effort in the task at hand and persist even when facing difficulties. Dedication describes a sense of high significance, challenge, inspiration, enthusiasm, and pride in one's work, which leads to a greater commitment to task performance and the overall role played in an organization. Absorption is characterized as being fully concentrated and happily engrossed in one's work; time passes quickly, and it may be difficult to disconnect from the task being performed (Schaufeli et al., 2002; Toth-Kiraly et al., 2021). Work engagement helps individuals to be goal-oriented, to focus on the task at hand, and to bring more energy and enthusiasm to the job, thereby typically enabling them to perform better and achieve higher levels of well-being compared with individuals who are less engaged (Hopstaken et al., 2015). Very high work engagement can also have negative consequences; for example, over-engagement and workaholism can lead to psychological ill-being in at-risk occupations and job settings (Sonnetag and Fritz, 2015; Toth-Kiraly et al., 2021). Therefore, the presence of *healthy* work engagement contributes to psychological utility in our model.

2.2.2. Job demands and resources, and associated stress and motivation processes

JD-R theory sets its main focus on two types of job characteristics that are deemed to shape and maintain job burnout and work engagement in characteristic ways: job demands and job resources (Bakker and Demerouti, 2017). Job demands are defined as “those physical, social, or 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). Job demands are not necessarily negative, but when many of them exist simultaneously and substantial effort is required to meet them, they may turn into stressors in certain circumstances (Bakker et al., 2010). Examples of job demands are high work pressure stemming from activities that demand a high level of cognition or emotionally exacting interaction with people (e.g., colleagues, patients, or customers). Job resources, on the other hand, refer to “those physical, psychological, social, or organizational aspects of the job that may do any of the following: (a) be functional in achieving work goals; (b) reduce job demands and the associated physiological and psychological costs; (c) stimulate personal growth and development” (Demerouti et al., 2001, p. 501). Examples of job resources are job control/autonomy, participation in decision-making, performance feedback, supervisor support, task variety, and opportunities for growth.

Job demands and resources activate two distinct and independent processes: (health-impairment/depleting) stress processes, and (energizing) motivational processes (Bakker et al., 2014; Bakker and Demerouti, 2017). In JD-R theory, job demands are strong predictors of job burnout (i.e., stress processes), whereas job resources are strong predictors of work engagement (i.e., motivational processes) (Demerouti et al., 2001). These pathways produce unique outcomes related to either stress or motivational processes (Bakker and Demerouti, 2017).

In addition to job demands and job resources, the JD-R model also incorporates personal resources as an important component that can also have an impact on both job burnout and work engagement (Bakker et al., 2014). Personal resources broadly refer to people's psychological capital (Baron et al., 2016) and their beliefs about “their ability to successfully control and have an impact on their environment” (Bakker, 2011, p. 266). Prior studies found that personal resources positively relate to desired outcomes, such as motivation, goal-setting, job performance, and life satisfaction (Judge et al., 2004; Youssef and Luthans, 2007). As such, JD-R theory suggests that personal resources (e.g., positive self-evaluations such as optimism or self-efficacy) can play a role similar to that of job resources, meaning that they have a direct, positive effect on work engagement and are able to buffer the undesirable impact of negative job demands on stress (Bakker and Demerouti, 2017).

2.3. The work recovery approach

Entrepreneurship scholars have lately begun to highlight work recovery among entrepreneurs (Wach et al., 2021; Williamson et al., 2021), yet this has yet to be integrated into stress and motivation models (such as JD-R theory). It is also crucial to address the fundamental question of which type of recovery is actually useful for entrepreneurs. So far, some entrepreneurship studies appear to indicate that entrepreneurs require particular support to realize recovery experiences, although it is still fairly unclear just how stressful entrepreneurial work typically is and what kind of value off-work recovery, for instance, would actually have for entrepreneurs.

In the occupational health literature, work recovery is recognized as an important process that helps to avoid ill-being in high engagement and stressful jobs by replenishing internal resources necessary for restoring an individual's mental, physical, and

emotional energy (Bennett et al., 2018; Sonnentag et al., 2022; Sonnentag and Fritz, 2015). To date little is known about how such work recovery operates concretely in the context of entrepreneurial stress (Stephan, 2018; Williamson et al., 2021); and this research problem is pertinent because an entrepreneur's drive to maintain strong work engagement over long periods, coupled with limited opportunities for work recovery, can come at the cost of burnout or workaholism (Gorgievski et al., 2010; Stroe et al., 2018; Toth-Kiraly et al., 2021; Wach et al., 2021).

Consequently, a better understanding of the *combined* experience of job demands, job and personal resources, and work recovery is necessary to advance our knowledge of the relationship between stress and well-being in entrepreneurs. Here, we essentially develop and test an opposing process model⁶ of entrepreneurship and burnout, where high work engagement (driven by better job and personal resources), coupled with low recovery from work (the 'always on alert'/'switched-on' pattern) subjects entrepreneurs to the risk of burnout due to a lack of winding down, yet better job and personal resources actually serve to protect them from burnout. These mechanisms represent opposing processes, where the former increases burnout while the latter decreases it (see also Murayama and Elliot, 2012; MacKinnon et al., 2007). This subsequently leads us to assume that entrepreneurs might *not* show burnout levels that differ from those of employees, although entrepreneurs are critically at risk of burnout.

Work recovery is defined as diversionary, relaxation or mastery-oriented experiences "during which individual functional systems that have been called upon during a stressful experience return to their prestressor levels" (Sonnentag and Fritz, 2007, p. 205). Diversionary experiences refer to psychologically disengaging from the job and imply the cessation of thinking about job-related problems, or mentally switching off from work; in other words, to detach from work psychologically after the daily work is done, also called 'off-work recovery' (Sonnentag et al., 2022; Sonnentag and Fritz, 2015). Relaxation experiences are associated with leisure activities (e.g., meditation or recreational walks), where the body can reach a state of low physiological and psychological activation and increased levels of positive affect (Boyatzis et al., 2021; Richardson and Rothstein, 2008; Sianoja et al., 2018). Mastery-oriented experiences refer to challenging and/or learning experiences that occur outside of the job (Sonnentag and Fritz, 2007). As highlighted above, work recovery helps employees gain and replenish internal resources and, thus, restore their mental, physical, and emotional energy (Richardson and Rothstein, 2008; Sonnentag and Fritz, 2015; Wach et al., 2021). Therefore, work recovery is essential to sustain workers' well-being and performance over time (Bennett et al., 2018; Williamson et al., 2021).

Intriguingly, entrepreneurs and their entrepreneurial work are often described as adhering to an 'always on alert' pattern, which could impair proper recovery processes, thereby affecting the vital psychological detachment from work during leisure time (Wach et al., 2021). Such psychological detachment from work has received much attention in occupational health research in employees due to its potential protection against psychological ill-being (e.g., in research on mindfulness and related recreational well-being strategies such as yoga; see Pascoe et al., 2017). Recent research has begun to devote more attention to the role of work recovery in the specific context of entrepreneurship, but it remains unclear whether entrepreneurs require (and proactively seek) recovery processes that are similar to those of employees.

In the following sections, we elaborate a set of hypotheses aimed at explaining work engagement and job burnout in entrepreneurs versus employees, and also between solo entrepreneurs versus entrepreneurs who employ others. As noted earlier, these hypotheses form our research model (Fig. 2), which we derive from our guiding framework of psychological utility (Fig. 1). In this model, we essentially interpret entrepreneurial work as a positive JD-R profile of demands and resources with a primacy of energizing motivation activation over depleting stress activation. Related to this are implications for off-work recovery, particularly benefits and costs, and thus its usefulness and prevalence in entrepreneurs. The central components of our theorizing are also depicted in Table 1. The final research model, in its holistic entirety, subsequently reveals the unique psychological utility of entrepreneurship.

2.4. Mechanisms behind entrepreneurial burnout

We begin by focusing on the single mechanisms that shape burnout levels. Drawing from JD-R theory and the recovery approach, and building on existing research in the occupational health and entrepreneurship literature, we postulate an opposing process model of entrepreneurship and burnout that contains specific mediation mechanisms, as explicated in the following.

First, as also illustrated in Table 1, we expect that entrepreneurs engage less in off-work recovery (e.g., psychological detachment after daily work) than employees do. As stressed above, it has become a predominant view in occupational health research (which of course mostly focuses on employees) to see such psychological detachment after daily work as a key mechanism to prevent high stress and burnout (Sonnentag et al., 2022; Sonnentag and Fritz, 2007). From this stress perspective, one could argue that lower levels of such off-work recovery would put entrepreneurs at risk of burnout. As discussed earlier, entrepreneurship scholars have recently begun to emphasize such a lack of recovery from potentially stressful entrepreneurial work as a major challenge for the well-being and productivity of entrepreneurs (e.g., Wach et al., 2021; Williamson et al., 2021; see also Kollmann et al., 2019). The often-cited 'always on alert'/'always switched-on' pattern of entrepreneurial work, alongside many entrepreneurs' ambitions to remain engaged with their entrepreneurial endeavors even after official working hours, can be expected to result in less recovery.

Interestingly, from a personal agency perspective, this lack of off-work recovery might also have to do with certain psychological costs that entrepreneurs anticipate and, therefore, purposefully avoid (although such recovery might be useful from a stress perspective) (see also Table 1). Staying in control, despite the entrepreneurial uncertainty and (shifting) challenges often faced by entrepreneurs, has been described as a key psychological driver in entrepreneurs (Sarasvathy, 2009), which is consistent with agency

⁶ Hypothesizing and testing this type of opposing mediation model is still rather new to entrepreneurship, compared to other fields, where it is more established (e.g., Murayama and Elliot, 2012; O'Rourke and MacKinnon, 2018).

Table 1

Summary of assumed JD-R patterns and the related role of off-work recovery.

	JD-R pattern	Implication for dual process (stress vs. motivation) and resulting activation pattern		Off-work recovery		
				Psychological benefits	Psychological costs	Prevalence
Entrepreneurial work	‘Positive’ JD-R pattern^a (Gain focus: individual can prioritize maximization of psychological utility)	Amplified motivation process (Energized high engagement) Muted stress process (Better protected from stress)	Primacy of (healthy) energizing motivation activation	Low (Few benefits given the primacy of positive motivation activation that counterbalances burnout risks)	High (Switching off-on costs, loss of control, etc.)	Low (Costs higher than benefits)
Employed work	‘Negative’ JD-R pattern^b (Loss focus: individual has to prioritize avoiding negative outcomes)	Amplified stress process (Higher risk for burnout) Muted motivation process (Less energized, low engagement)	Primacy of (unhealthy) depleting stress activation	High (Important to counterbalance primacy of negative stress activation = actual recovery benefits)	Low (Less disruption of positive activation, lower switching off-on costs, less loss of control, etc.)	High (Benefits higher than costs)

^a ‘Positive’ stands for a more favorable pattern of elevated job and personal resources, with average (non-elevated) job demands (=primacy of motivation activation, according to JD-R theory).

^b ‘Negative’ stands for a less favorable pattern of lower job and personal resources, with average job demands (=primacy of stress activation, according to JD-R theory).

theories (Bandura, 1989; Heckhausen and Schulz, 1995; Lerner and Busch-Rossnagel, 1981). To stay in control, as the ‘pilot in the plane’ (Sarasvathy, 2009), entrepreneurs need to concentrate on a wide variety of job tasks and decision-making processes (Lazear, 2005), which are often not merely routines but responses to new situations. Hence, as noted earlier, this requires a certain ‘switched on’ mental state (Tang et al., 2012). Completely switching off after the daily work is done, and then switching on again the next day, could arguably produce an elevated cognitive load for entrepreneurs who need to oversee a complex set of tasks (Sweller, 1988). Since such entrepreneurial work task and decision-making processes often *do not* represent simple routines but require complex, entrepreneurial cognition and continuous adaptations to changing circumstances, from a cognitive load and motivational perspective it is actually beneficial to stay switched on to a certain degree after work. This ultimately lowers cognitive load and also helps entrepreneurs feel more in control (the captain in the plane on a flight is still the captain, even during recovery breaks). Nevertheless, it is central for our hypothesized model that, from a stress perspective, entrepreneurs might be more at risk of burnout if they avoid off-work recovery (Sonnentag et al., 2022)—and hence we model it as a risk factor (an indirect effect in Fig. 2 that would increase burnout in entrepreneurs).

Second, while less recovery from work might place entrepreneurs at risk for burnout, we also hypothesize that an important protective mechanism is to be found in entrepreneurs’ job and personal resources. In regard to job resources, research has established that entrepreneurs enjoy high levels of job autonomy, full participation in decision-making, and direct feedback and reward for their decisions and actions (Millán et al., 2013; Nordenmark et al., 2012). Job autonomy as a central job resource of entrepreneurs has been linked to lower stress levels in entrepreneurs (Hessels et al., 2017), and this is also regarded as increasing well-being (e.g., happiness) in entrepreneurs (Benz and Frey, 2008). In regard to personal resources, entrepreneurship scholars have highlighted the role of personality traits shared by many entrepreneurs and individuals who are attracted to entrepreneurship, traits that influence how one interprets and copes with stressors (Baron et al., 2016). Hence, self-selection could be at work in this context, implying that individuals who opt for entrepreneurship have certain psychological capacities (including personal resources) that predispose them to dealing more effectively with work-related stress. Here, prior research has shown that entrepreneurs exhibit more optimism than other individuals when dealing with complex or uncertain situations (Hmieleski and Baron, 2009), and their positive attitudes to self-efficacy are often considerably higher (Newman et al., 2019). Baron et al. (2016) have revealed higher levels of psychological capital in entrepreneurs than in other populations, and the authors speculate that such dispositions enable entrepreneurs to tolerate or manage the adverse effects of stress more efficiently—in other words, entrepreneurs might be less stressed than non-entrepreneurs.

Third, it is important to note that JD-R theory also indicates a positive relationship between job demands and job burnout. While entrepreneurial work is often assumed to entail particularly taxing job demands and stressors (OECD, 2017; Stephan, 2018), the evidence does not provide a clear picture of the differences in job demands between entrepreneurs and employees. For example, although prior research indicates that entrepreneurs tend to report longer working hours (Nordenmark et al., 2012), their subjective perception of job demands can be lower than that of wage workers (Parslow et al., 2004; Prottas and Thompson, 2006). Hessels et al. (2017, p. 183) have concluded that “there is little indication, however, that on average the level of job demand is different for the self-employed than for wage workers.” For these reasons we did not develop a hypothesis for the possible mediating effect of job demands

on job burnout.

Since we assume the existence of opposing processes—one that puts entrepreneurs at risk, and one that protects them—we consequently assume that entrepreneurs' burnout levels do not differ from those of employees. In other words, while there might be no statistically significant relationship between entrepreneurship and burnout, important dynamics behind this link are 'masked'. As highlighted by MacKinnon et al. (2007, p. 602), "there are several examples in which an overall X to Y relation may be nonsignificant, yet mediation exists." Hence, such opposing process models contribute to a better understanding of relationships and the complex dynamics that underlie them (Murayama and Elliot, 2012), as for instance has been the case in showing the effectiveness and mechanisms of psychological interventions in the absence of a given intervention's direct statistical effect (O'Rourke and MacKinnon, 2018).

Hypothesis 1. There are opposing mediation effects between being an entrepreneur vs. being employed on the one side, and burnout on the other (H1a, b vs. H1c).⁷

H1a. Entrepreneurs show *higher* levels of job resources – and job resources have a negative effect on burnout.

H1b. Entrepreneurs show *higher* levels of personal resources – and personal resources have a negative effect on burnout.

H1c. Entrepreneurs show *lower* levels of work recovery – and work recovery has a negative effect on burnout.

2.5. Mechanisms behind entrepreneurial engagement

Based on JD-R theory as part of our agency-based utility approach, we assume that entrepreneurs show higher levels of work engagement than employed individuals due to their (energizing) higher job and personal resources, and as a utility maximization process given the positive utility pattern offered by entrepreneurial work. First, compared with salaried individuals, individuals who choose to be entrepreneurs usually rate highly in several psychological traits that have been found to predict work engagement across occupations, such as achievement-related traits (e.g., self-efficacy, internal locus of control, and need for achievement), resilience, and general positive dispositions, such as optimism and hope (Simmons and Lovegrove, 2005; Sweetman and Luthans, 2010). Second, entrepreneurs might benefit in particular from a core job resource that is undeniably associated with entrepreneurial work: job autonomy and control (e.g., the ability to set priorities and to select and organize personal work tasks) (Millán et al., 2020; Nordenmark et al., 2012; Protas and Thompson, 2006). Having more autonomy and control at work allows entrepreneurs to organize their daily tasks and schedule, and to craft their job, as they please, thereby attaining a more meaningful and motivational work experience (and deriving what Benz and Frey (2008) have termed 'procedural utility'). In addition, the variety of tasks that entrepreneurs need to perform, as well as the creative character of their work, makes their job content richer in comparison with many other occupations; furthermore, this also helps to activate their intrinsic motivation and, thus, personal engagement levels (Bakker and Demerouti, 2017; Gagné and Deci, 2005; Gorgievski et al., 2010). We did not expect an effect of work recovery on work engagement, following previous recovery research (Kinnunen et al., 2011).

Hypothesis 2. Entrepreneurs experience higher work engagement levels than employed individuals because they benefit from (a) higher levels of engagement—enhancing job resources, and (b) higher levels of engagement—enhancing personal resources.

Taking *Hypotheses 1 and 2* together we thus assume that entrepreneurs, compared to employed individuals, experience the more positive JD-R pattern in terms of demands and resources (as also illustrated in Table 1). This boosts their high, healthy engagement, while avoiding negative outcomes (burnout)—two hallmarks of psychological utility as defined from a positive psychology perspective.

2.6. Differences between solo entrepreneurs and employer entrepreneurs

Our framework also allows us to make a more specific assumption for entrepreneurial subpopulations. Following earlier work indicating that stress, motivation, and recovery processes may differ between entrepreneurial groups (Baron et al., 2016; Bennett et al., 2021; Hessels et al., 2017; Stephan, 2018; Wach et al., 2021), we also developed assumptions when comparing solo entrepreneurs with employer entrepreneurs (i.e., those employing others in their businesses). Existing evidence that compares these two types of entrepreneurs is not clear in terms of the effect on stress, work engagement, and work recovery that arises from hiring employees. For example, Hessels et al. (2017) found that solo entrepreneurs show lower levels of stress compared to employer entrepreneurs, although other studies suggest that this effect is not consistent across samples of entrepreneurs (Fernet et al., 2016; Torrès et al., 2021). Similar results are found for work engagement and work recovery (Baron et al., 2016; Stephan, 2018; Williamson et al., 2021).

Here we assume that solo entrepreneurs might be able to derive the most psychological utility from their work, due to their particularly positive JD-R pattern. In other words, they might represent a prime example of the entrepreneurial utility mechanisms illustrated in Table 1. Specifically, we assume that solo entrepreneurs report perceiving less burnout because they face less stressful job demands than other entrepreneurs do. First, the businesses of entrepreneurs with employees tend to be larger, more complex, and more

⁷ Note that this assumption that this opposing mediation leads to non-significant differences in job burnout levels between entrepreneurs and employed individuals is not part of the actual hypothesis because we do not actually test such a null hypothesis in our analyses. It is merely our logical conclusion if opposing mediation (*Hypothesis 1*) is indeed present (MacKinnon, Fairchild & Fritz, 2007; see also Murayama and Elliot, 2012).

ambitious than those of solo entrepreneurs, which increases the number and variety of both tasks and working relationships (e.g., employees, providers, and clients). In addition, the process of growing a business increases the number of demands (e.g., higher number of clients and suppliers, and higher administrative and legal requirements) with which employer entrepreneurs need to deal, thereby reducing their capacity to influence (or control) what happens in their work environment and, thus, lowering their perception of job autonomy, in comparison to being a solo entrepreneur (Dijkhuizen et al., 2016; Fernet et al., 2016; Mäkinen et al., 2020). Second, running a larger and more complex business implies dealing with a higher workload (e.g., increased administrative, coordinating, or coaching activities), more diverse and psychologically demanding tasks (e.g., attracting and retaining clients, and securing financing), and higher work and emotional pressure arising from supervisory tasks and direct responsibility for employees' emotional and economic well-being (Fernet et al., 2016; Lazear, 2005; Prottas and Thompson, 2006), all of which are factors associated with higher levels of stress (Lerman et al., 2021; Mäkinen et al., 2020; Wei et al., 2015).

Hypothesis 3. Solo entrepreneurs experience lower job burnout levels than employer entrepreneurs because they face lower levels of burnout—enhancing job demands while maintaining high engagement levels.

3. Methods

3.1. Data

We used original panel survey data comprising four waves collected at two-month intervals using the proprietary Bilendi Panel in the United Kingdom in 2016 (www.bilendi.co.uk) (see also Kibler et al., 2019). We chose a two-month interval for the survey waves because we judged this to be sufficiently long to reduce common method bias (the respondent being unlikely to be biased by their responses to the previous wave) and improve causal inference, while at the same time being short enough to facilitate low attrition rates: Bilendi recommended conducting multi-wave studies within a timeframe of about six months, so as to ensure that the majority of the respondents stayed with the panel throughout the study.

Bilendi recruits panelists from a range of online sources, including partnerships, advertisements, social media, sponsored links, and referral programs. The recruitment of panelists is permission-based, ensures the absence of duplicate entries, and pays particular attention to representativeness in terms of the panel's regional, social, and age distribution. We compared the panel's gender, age, and occupation distribution with UK national statistics from the same year. While women are over-represented in the panel in comparison to national statistics (57 % vs. 50 %), the age distribution is very similar in different groups within the 25-to-65-year age bracket used in our survey (e.g., 23 % and 30 % of Bilendi panelists are 25–34 and 35–49 years old, respectively, compared to 23 % and 34 % nationally). Self-employed individuals are under-represented in the panel: the self-employment rate in the panel is 8 %, compared to 15 % nationally. Bilendi panelists receive loyalty points that can be exchanged for a wide range of goods or services, or a small cash incentive for participating in surveys.

The cover letter introducing the questionnaire clearly identified the study as 'academic research', acknowledged the names and affiliations of the research team, and assured respondents of their anonymity. The primary target group of the survey comprised 525 individuals identified by the service provider's database as 'entrepreneurs'. We also drew a random sample of 3000 individuals from the general adult population (between 25 and 65 years of age) included in the database. At the beginning of the survey we screened out those who were neither entrepreneurs nor employed in a commercial enterprise. To reduce heterogeneity and improve comparability with the focal sample of entrepreneurs, we restricted the employee sample to commercial enterprises. The research agency applied weighting procedures in data collection from the random sample to ensure that the final sample of employees we received through this procedure was representative of UK wage and salary employees in this age bracket, and that non-response bias was not an issue.

At baseline, 1085 employees and 414 entrepreneurs completed the questionnaire; the number of missing values or patterned responses was not excessive. The retention rates among entrepreneurs surveyed at baseline were 93 % in Wave 2, 64 % in Wave 3, and 54 % in Wave 4. Corresponding rates for employees were 97 %, 65 %, and 54 %. In each wave we ensured that the entrepreneurs were operating the same business and that the employees were in the same jobs as at baseline. Our analytic sample consists of those who participated in two or more waves (348 entrepreneurs and 1002 employees). This is because we use lagged variables as predictors to improve causal inference and reduce common method bias.

By using means comparisons, we found that entrepreneurs lost to follow-up were likelier to have lower levels of small administrative tasks that hinder the progress of their main work, and higher levels of role overload. They were also younger than those who participated in two or more waves. Among the employees, those who opted out of the survey after Wave 1 were on average likelier to be younger and have a higher level of education than employees in the analytic sample. The remaining characteristics included in our analysis were similar, regardless of attrition status. However, given that only 66 entrepreneurs and 83 employees did not participate in at least Wave 2 in addition to the baseline, the effects of attrition should not be overstated.

Although specifically targeting those 525 individuals known to be entrepreneurs make the data non-representative as a whole, having a sizable sample of entrepreneurs should ensure the reliability of the tests of our hypotheses. Due to the oversampling of entrepreneurs, we ran additional tests of non-response bias and representativeness for the final sample of entrepreneurs with the UK population of entrepreneurs. For this purpose, we conducted an archival analysis (Rogelberg and Stanton, 2007) by comparing the entrepreneur respondents' personal (gender, age) and firm characteristics (region, industry, number of employees) with those of the UK small-business population using data from the Office for National Statistics (2016a, 2016b).

The age density curves for entrepreneurs in the UK and those in our sample look similar: the density in the under-65 age group increases until individuals' mid-40s, thereafter declining with each additional year of age. The gender distribution in our sample is,

however, markedly different from the population: whereas only 21 % of UK entrepreneurs are women, the respective percentage in our sample is 43 %. Hence, we control for the effect of gender in our analysis. The regional distribution of the sample is very similar to the national distribution: London and the South East of England account for approximately one third of the sample, followed by the Midlands (15 %) and North West (11 %). Approximately one third of the sampled entrepreneurs operate in the service sector, which is similar to the population statistics. The major industry difference is the lower share of firms in the manufacturing and construction sectors in the sample compared to the population, and a higher share of firms classified as ‘other’ in our sample. This is most likely due to our survey using fewer categories than those listed in national statistics, thus leading more respondents to not finding an industry description that they felt was suitable for their business. The size distribution of the sampled businesses shows 92 % micro-enterprises (fewer than 10 employees), which is close to the national figure of 96 %. However, our sample contains fewer solo entrepreneurs (57 %) in comparison to the population (76 %). We take this into account by estimating separate models for entrepreneurs with and without employees.

3.2. Measures

3.2.1. Dependent variables

Job burnout was operationalized as emotional exhaustion from work by using a five-item scale, anchored at *very rarely* (1) and *very often* (5), by Maslach et al. (1996). Sample items include “I feel emotionally drained from my work”, and “I feel tired when I get up in the morning and have to face another working day”. Note that often job burnout is not only operationalized via such exhaustion but also via cynicism and inefficacy (Maslach et al., 2001). However, it is widely established that exhaustion is the cardinal indicator of burnout—especially from a stress perspective (Maslach et al., 2001).

Work engagement was measured with seven items adapted from the Utrecht Work Engagement Scale UWES-9 (Schaufeli et al., 2006). Sample items include “When I work, I feel full of energy”, and “I am enthusiastic about my work”. The items for both scales were measured on a five-point rating scale anchored at *very rarely* (1) and *very often* (5).

Although exhaustion and engagement have been associated with negative and positive work outcomes, respectively, prior studies have not included the entrepreneurial context. In order to ensure the nomological validity of our dependent variables, we examined their correlations with the logical consequences of being either exhausted or engaged with work: *life satisfaction*, *work satisfaction*, and *self-reported progress toward main work goals in the last 2 months*. All three variables were measured with single items on a percent scale from 0 to 100 %. As expected, exhaustion correlates negatively (Pearson correlation coefficients with life satisfaction, work satisfaction, and performance are -0.38 , -0.48 , and -0.31 , respectively; all $p < 0.001$) and engagement correlates positively (0.40 , 0.64 , and 0.40 ; all $p < 0.001$) with these outcomes.

3.2.2. Independent variables

3.2.2.1. Entrepreneurial status. Following Hessels et al. (2017), we examined two types of entrepreneurial status variables. First, we used one indicator variable to capture whether the person is an *entrepreneur* (coded as 1; vs. an employee in a commercial enterprise, coded as 0). Second, we also distinguished between *solo entrepreneurs* (operating a business with no employees other than themselves; coded as 1) and *employer entrepreneurs* (operating a business with employees; coded as 0).

3.2.3. Mediators

3.2.3.1. Job resources. We focused on personal autonomy at work as a key job characteristic in the entrepreneurial stress process identified in prior research (e.g., Kibler et al., 2019). We operationalized *autonomy* in terms of both work tasks and working hours, and measured this characteristic by using six items adapted from Semmer et al. (1999), including “How much can you influence the work tasks you undertake”, “To what extent can you decide how to accomplish a work task”, and “To what extent can you independently schedule a work day”. The scale items were measured on a five-point rating scale anchored at *never* (1) and *always* (5).

3.2.3.2. Personal resources. Following Baron et al. (2016), we measured *psychological capital* with the 12-item Psychological Capital Questionnaire (PCQ-12), which comprises the sub-dimensions of hope, optimism, resilience, and self-efficacy, and whose validity and reliability have been established in several prior studies (Avey et al., 2010). If the wording of the original items was aimed at employees, the respective item's wording was adjusted accordingly for the respondents who identified themselves as entrepreneurs. Sample items include “Currently, I am meeting the work goals that I have set for myself” (hope), “I can get through difficult times at work because I have experienced difficulty before” (resilience), “I feel confident presenting my work in meetings with important stakeholders” (self-efficacy/entrepreneurs), “I feel confident representing my work area in meetings with management” (self-efficacy/employees), and “I always look on the bright side regarding my work” (optimism). Responses could be given on a five-point rating scale anchored at *disagree strongly* (1) and *agree strongly* (5).

3.2.3.3. Job demands. We measured a list of five job demands, two of which capture potential *hindrance demands*: the extent to which the accomplishment of the main work tasks is hindered by small administrative tasks (*administrative task hindrance*), and the degree of ambiguity felt by an individual about their work role (*role ambiguity*). Administrative task hindrance was measured with a variable capturing how often interviewees felt that progress in their main work was hindered by necessary minor administrative tasks. We used

six categories from *very rarely or never* to *almost daily*. Role ambiguity was measured with a four-item scale adapted from Rizzo et al. (1970), including “Clear, planned goals and objectives exist for my work”, and “I know what my responsibilities are”. The items were measured on a five-point rating scale anchored at *disagree strongly* (1) and *agree strongly* (5). We reversed the item scores to create a scale of role ambiguity.

The remaining three job demands constitute potential *challenge demands*: the degree to which *role overload* and *time pressure* were experienced in work, as well as the extent of the total *workload*. Role overload was measured with two items adapted from Beehr et al. (1976) (see also Beehr et al., 2000): “It often seems there is too much work for one person to do”, and “The performance standards set for my work are too high”. The items were measured on a five-point rating scale anchored at *disagree strongly* (1) and *agree strongly* (5). Time pressure was captured with three items adapted from Semmer et al. (1999): “How often are you under time pressure at work”, “How often do you end up working longer than intended”, and “How often do you have to work at high speed”. The items were measured on a five-point rating scale anchored at *very rarely/never* (1) and *very often* (5). Workload was measured by asking the respondent to indicate the number of hours they worked per week over the last two weeks.

3.2.3.4. Work recovery. We operationalized work recovery with a four-item scale of psychological job detachment after work, adapted from Sonnentag and Fritz (2007) (e.g., “I forget about work”, “I distance myself from work”). This variable measures how respondents detach *mentally* from their daily work (e.g., during leisure time), which is often considered an essential protective mechanism in stress processes (Sonnentag & Bayer, 2005). This was measured on a five-point rating scale anchored at *disagree strongly* (1) and *agree strongly* (5).

3.2.4. Control variables

We controlled for gender, age, and education. We also controlled for the number of vacation days taken by respondents in the preceding two months (Bloom et al., 2009). We use a logarithmic transformation of the number of vacation days to correct for skewedness.

3.3. Analysis strategy

We chose to use structural equation modeling (SEM) for two reasons. First, almost all our variables consist of multi-item scales, and modeling these as latent variables allowed us to account for measurement error. Second, our hypotheses imply multiple mediation effects that are best tested by computing indirect effects in the SEM framework (Williams et al., 2009). Our model uses lagged predictors to improve causal inference and reduce common method bias; the dependent variables are from Wave t , while the mediators are from Wave $t-1$. The dependent variables and mediators are stable over time across the four survey waves: one-way analysis of variance (ANOVA) tests did not reveal significant means differences for any of these variables. The independent variables (entrepreneur/employed, and solo entrepreneur/entrepreneur with employees) and the control variables gender, age, and higher education degree are time invariant in our modeling context. The control variable that captures the number of vacation days in the preceding two months is taken from Wave t , because a recent vacation is likelier to influence present job burnout than a vacation taken several months ago (Bloom et al., 2009). Because our model can include multiple observations per respondent, we report cluster-robust standard errors in the structural models to account for the non-independence of two or more observations from the same respondent. The entire analysis was carried out with the software package Stata 15.

4. Results

4.1. Measurement model

Our SEM estimation strategy followed the two-step approach recommended by Anderson and Gerbing (1988), the initial step of which is to assess the dimensionality, reliability, and validity of the measurement scales prior to estimating the structural equations. We started by running an exploratory principal components analysis to identify whether the individual items constituting the measurement scales load satisfactorily on their intended factors. Since the loadings were low-factor, we decided to discard two items from the PSQ-12 scale: one relating to hope (“If I had a problem at work, I could think of many ways to solve it”) and one belonging to the resilience sub-dimension (“I can work effectively alone if I have to”). This still leaves two or three items for each sub-dimension within the psychological capital scale.

Next, we performed a confirmatory factor analysis (CFA). Because psychological capital comprises four sub-dimensions, we modeled it as a second-order latent variable; the latent variable ‘psychological capital’ predicts the latent variables ‘hope, resilience, self-efficacy, and optimism’, which in turn are associated with the respective observed variables. All other constructs were modeled as first-order latent variables. We ran the CFA separately for each survey wave. The standardized factor loadings were all significant at the $p < 0.001$ level, and the fit of the model with the data in each wave was satisfactory (Hu and Bentler, 1999); the comparative fit index (CFI) scores range from 0.948 to 0.951, the standardized root mean squared residual (SRMR) index values range from 0.048 to 0.051, and the root mean square error of approximation (RMSEA) scores range from 0.043 to 0.045.

Table A1 in the appendix reports the latent variable correlations in the CFA model alongside the Cronbach's alphas, composite reliabilities, and square roots of the average variance-extracted (AVE) scores for each factor. The Cronbach's alphas and composite reliabilities of all constructs exceed the recommended threshold level of 0.7, suggesting satisfactory reliability (Chin, 1998; Nunnally,

1978). Because the square root of each construct's AVE exceeds its correlation with the other latent variables, we concluded that the measurement model has good discriminant validity (Fornell and Larcker, 1981). While the values reported in Table A1 are based on the CFA for Wave 1, the results in all other waves are very similar. Furthermore, we estimated varying specifications of the CFA model, such as one factor explaining all items or the items of constructs with high latent variable correlations loading on a single factor. In every specification tested, the fit of the alternative model was significantly worse than in the original model, where all items load on their theoretically specified factors.

4.2. Descriptive statistics

Following Hessels et al. (2017), Table 2 displays the means and standard deviations and Table 3 the inter-correlations of all variables included in the analyses.

4.3. Structural model

4.3.1. Hypothesis tests

Table 4 displays the results for the models testing the effect on job burnout (exhaustion) and work engagement of being an entrepreneur, as compared with being an employee, whereas Table 5 presents the results for being a solo entrepreneur, as compared with being an employer entrepreneur. To facilitate comparability with Hessels et al. (2017) and the presentation's readability, the results tables omit the paths from the group dummies (entrepreneur vs. employee, and solo entrepreneur vs. employer entrepreneur) and the demographic control variables on the individual mediators, even though those paths are included in the structural model. Instead, following Hessels et al. (2017), we integrated the indirect effects in the main results tables as tests of the mediation hypotheses. In addition to the regression tables, Fig. 3 provides an overview of the significant coefficients for the paths from the independent group variables to the mediators, and from the mediators to the dependent variables.

Model 1 in Table 4 reveals that entrepreneurs have lower levels of job burnout than employees (whereas our initial conceptual model shown in Fig. 1 would have assumed a non-significant relationship). The coefficient of the entrepreneur dummy is negative and significant at the $p < 0.01$ level. The other regressions depicted in Table 4 examine the mediation effects behind this direct effect by first testing the effects of personal and job resources (Model 2), then the effect of work recovery (Model 3), followed by the effect of job demands (Model 4), and finally all of these together (Model 5). The results indicate some support for Hypothesis 1a: job resource 'autonomy' is a significant mediator of the effect on job burnout of being an entrepreneur in comparison to being an employee. However, psychological capital as a personal resource is not a significant mediator, and the same applies to work recovery (although entrepreneurs show significantly less recovery from their daily work than do employees; see Table 2). Thus, Hypotheses 1b and 1c are not supported.

The results in Table 4 also provide some support for Hypothesis 2, which addresses work engagement as the dependent variable. The coefficient of the entrepreneur dummy on engagement in Model 1 is positive and significant at the $p < 0.001$ level—as expected,

Table 2
Descriptive statistics.

	(1) Employees		(2) Entrepreneurs		(1)–(2)	(3) Employer entrepreneurs		(4) Solo entrepreneurs		(3)–(4)
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Dependent variables										
Job burnout (Exhaustion)	2.72	1.07	2.55	0.99	0.17***	2.72	1.04	2.43	0.94	0.29***
Work engagement	3.31	0.90	3.70	0.78	−0.39***	3.73	0.84	3.68	0.74	0.05
Job/personal resources										
Autonomy	3.47	0.83	4.30	0.70	−0.83***	4.20	0.73	4.36	0.67	−0.16***
Psychological capital	3.71	0.62	3.69	0.66	0.02	3.86	0.66	3.57	0.64	0.29***
Job demands										
Administrative tasks	4.01	1.56	3.76	1.49	0.25***	3.88	1.48	3.68	1.49	0.20*
Role ambiguity	2.25	0.75	1.98	0.69	0.27***	1.98	0.72	1.98	0.66	0.00
Role overload	2.97	0.98	2.93	1.00	0.04	3.23	1.00	2.70	0.94	0.53***
Time pressure	3.38	1.04	3.15	1.01	0.23***	3.41	0.95	2.95	1.00	0.46***
Workload	45.11	16.39	41.66	18.97	3.45***	47.66	19.41	37.24	17.37	10.42***
Work recovery										
Psychological detachment	3.37	0.97	2.97	0.98	0.40***	3.01	1.03	2.94	0.94	0.07
Control variables										
Female (base: male)	0.37		0.43		−0.06***	0.42		0.45		−0.03
Age	45.79		47.24	10.65	−1.44***	44.37	11.31	49.35	9.61	−4.98***
Higher education (base: no higher education)	0.38		0.46		−0.08***	0.45		0.46		−0.01
Number of vacation days in last 2 months	3.49	4.70	3.81	6.12	−0.32	3.63	5.86	3.93	6.31	−0.30
Observations	3276		1137			482		655		
Individuals	1020		361			155		206		

Note: Statistical significance tests of mean differences are based on *t*-tests for continuous and chi-squared tests for categorical variables. *, **, and *** indicate statistical significance at $p < 0.05$, 0.01, and 0.001 levels, respectively.

Table 3
Correlations.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Entrepreneurs (base: employee)	1														
2. Solo entrepreneur (base: employer entrepreneur)	–	1													
3. Job burnout (exhaustion)	–0.07*	–0.15*	1												
4. Work engagement	0.19*	–0.03	–0.37*	1											
5. Job resources (autonomy)	0.41*	0.11*	–0.25*	0.4*	1										
6. Work recovery (detachment)	–0.17*	–0.04	–0.18	–0.03	–0.03	1									
7. Personal resources (psychological capital)	–0.03	–0.22*	–0.26	0.53*	0.44*	0.14*	1								
Job demands															
8. Administrative tasks	–0.06*	–0.05	0.32*	–0.09*	–0.02	–0.15	–0.06*	1							
9. Role ambiguity	–0.15*	0.00	0.30*	–0.54*	–0.47*	–0.10	–0.60*	0.15*	1						
10. Role overload	–0.01	–0.26*	0.45*	–0.13*	–0.13*	–0.17*	–0.07*	0.30*	0.16*	1					
11. Time pressure	–0.09*	–0.23*	0.42*	–0.04*	–0.07*	–0.19*	0.01	0.52*	0.10*	0.42*	1				
12. Workload	–0.10*	–0.27*	0.13	0.02	–0.01	–0.09*	0.06*	0.14*	0.04*	0.13	0.20*	1			
13. Female	0.06*	0.03	0.04*	0.04*	0.01	–0.04*	–0.03	0.03	–0.03	–0.00	0.02	–0.05*	1		
14. Age	0.06*	0.23*	–0.13*	0.10*	0.11*	0.05*	0.07*	–0.05*	–0.11*	–0.15*	–0.10	0.01	–0.24*	1	
15. Higher education	0.07*	0.00	0.01	0.02	0.03	–0.09*	0.03	0.06*	0.03	0.07*	0.03	–0.08*	0.06*	–0.21*	1
16. Number of vacation days ^a	–0.04*	0.02	–0.04*	0.02	–0.01	0.08*	0.03	0.02	–0.01	–0.03	–0.03	–0.05*	–0.00	0.04*	0.05*

Notes: The second column is based entirely on the entrepreneur sub-sample. All remaining columns are based on the full sample. Pearson product-moment correlation coefficients were used.

* $p < 0.05$ (two-tailed).

^a Logarithmic transformation was used in the correlation analysis. Note that the second column in this table uses only the entrepreneur sample because it displays the correlations of being an employer entrepreneur compared with being a solo entrepreneur, together with the dependent variables, mediators, and controls.

Table 4

Structural model: the effect of being an entrepreneur in comparison to being an employee.

	(1)		(2)		(3)		(4)		(5)	
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
Entrepreneur (base: employee)	−0.07** (0.02)	0.19*** (0.02)	−0.01 (0.03)	0.11*** (0.02)	−0.12*** (0.03)	0.19*** (0.03)	−0.02 (0.02)	0.13*** (0.02)	−0.01 (0.03)	0.09*** (0.02)
Job/personal resources										
Job autonomy _{t-1}			−0.18*** (0.04)	0.24*** (0.03)					−0.11** (0.03)	0.15*** (0.03)
Psychological capital _{t-1}			−0.25*** (0.04)	0.53*** (0.03)					−0.19*** (0.03)	0.39*** (0.04)
Job demands										
Administrative tasks _{t-1}							0.10*** (0.03)	−0.01 (0.02)	0.11*** (0.03)	−0.02 (0.02)
Role ambiguity _{t-1}							0.22*** (0.03)	−0.50*** (0.02)	0.07* (0.03)	−0.19*** (0.04)
Role overload _{t-1}							0.40*** (0.03)	−0.13*** (0.03)	0.38*** (0.03)	0.03 (0.03)
Time pressure _{t-1}							0.30*** (0.03)	0.02 (0.03)	0.30*** (0.03)	0.12*** (0.03)
Workload _{t-1}							0.02 (0.02)	0.07*** (0.02)	0.03 (0.02)	0.03 (0.02)
Work recovery										
Psychological detachment _{t-1}					−0.21*** (0.03)	−0.00 (0.03)			−0.05 (0.03)	−0.14*** (0.03)
Control variables										
Female	0.01 (0.03)	0.05* (0.03)	0.01 (0.03)	0.04 (0.02)	0.00 (0.03)	0.04 (0.03)	0.04 (0.02)	0.02 (0.02)	0.03 (0.02)	0.04* (0.02)
Age	−0.14*** (0.03)	0.12*** (0.03)	−0.11*** (0.03)	0.05** (0.02)	−0.13*** (0.03)	0.11 (0.03)	−0.01 (0.02)	0.02 (0.02)	−0.02 (0.02)	0.03 (0.02)
Higher education	−0.01 (0.03)	0.02 (0.03)	−0.00 (0.03)	0.01 (0.02)	−0.03 (0.03)	0.03 (0.03)	−0.05* (0.02)	0.06* (0.02)	−0.04 (0.02)	0.01 (0.02)
Number of vacation days ^a	−0.04* (0.02)	0.02 (0.02)	−0.05 (0.02)	0.01 (0.02)	−0.05* (0.02)	0.02 (0.02)	−0.05* (0.02)	0.02 (0.02)	−0.04* (0.02)	0.01 (0.02)
Indirect effect of being an entrepreneur vs. employee										
Total			−0.16*** (0.04)	0.17*** (0.04)	0.09*** (0.02)	0.00 (0.01)	−0.15** (0.05)	0.13*** (0.03)	−0.18** (0.06)	0.21*** (0.04)
Via job autonomy			−0.08*** (0.02)	0.10*** (0.01)					−0.04** (0.01)	0.06*** (0.01)
Via psychological capital			0.00 (0.01)	−0.01 (0.02)					0.00 (0.01)	−0.01 (0.01)

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Table 4 (continued)

	(1)		(2)		(3)		(4)		(5)	
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
Via administrative tasks							−0.01* (0.00)	0.00 (0.00)	−0.01* (0.00)	0.00 (0.00)
Via role ambiguity							−0.03*** (0.01)	0.07*** (0.01)	−0.01* (0.00)	0.03*** (0.01)
Via role overload							−0.00 (0.01)	0.00 (0.00)	−0.00 (0.01)	−0.00 (0.00)
Via time pressure							−0.03** (0.01)	−0.00 (0.00)	−0.03** (0.01)	−0.01* (0.01)
Via workload							−0.00 (0.00)	−0.01* (0.00)	−0.00 (0.00)	−0.00 (0.00)
Via psychological detachment					0.09*** (0.02)	0.00 (0.01)			0.01 (0.01)	0.03*** (0.01)
Observations	4413		2928		2928		2928		2928	
Individuals	1381		1350		1350		1350		1350	
R-squared	0.05	0.03	0.12	0.38	0.07	0.05	0.33	0.31	0.33	0.41

Notes: Smaller sample sizes in Models 2–4 are due to the use of lagged variables and missing values on the mediators of 31 individuals. Maximum-likelihood estimates were made. Standardized coefficients with cluster-robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 5 %, 1 %, and 0.1 % levels (two-tailed), respectively. Both dependent variables are from Wave *t*, whereas all time-variant predictors are from Wave *t*−1.

^a Logarithmic transformation was used in the analysis.

Table 5

Structural model: the effect of being a solo entrepreneur in comparison to being an employer entrepreneur.

	(1)		(2)		(3)		(4)		(5)	
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
Solo entrepreneur (base: employer entrepreneur)	−0.12* (0.05)	−0.04 (0.05)	−0.11 (0.06)	0.04 (0.05)	−0.09 (0.06)	−0.06 (0.06)	0.10 (0.05)	−0.05 (0.05)	0.08 (0.05)	0.01 (0.05)
Job/personal resources										
Job autonomy _{t-1}			−0.12 (0.06)	0.20*** (0.05)					−0.08 (0.06)	0.13** (0.05)
Psychological capital _{t-1}			−0.13* (0.06)	0.49*** (0.07)					−0.14* (0.06)	0.43*** (0.07)
Job demands										
Administrative tasks _{t-1}							0.14* (0.06)	−0.10* (0.05)	0.13* (0.06)	−0.09 (0.04)
Role ambiguity _{t-1}							0.11* (0.04)	−0.45*** (0.05)	−0.01 (0.05)	−0.18** (0.06)
Role overload _{t-1}							0.49*** (9.06)	−0.20** (0.06)	0.47*** (0.06)	−0.19*** (0.05)
Time pressure _{t-1}							0.20* (0.09)	0.26*** (0.06)	0.24** (0.08)	0.23*** (0.05)
Workload _{t-1}							0.06 (0.05)	0.04 (0.05)	0.07 (0.05)	−0.01 (0.04)
Work recovery										
Psychological detachment _{t-1}					−0.04 (0.06)	−0.15** (0.06)			0.04 (0.05)	−0.22*** (0.05)
Control variables										
Female	0.10 (0.05)	0.03 (0.05)	0.08 (0.06)	0.10* (0.05)	0.10 (0.06)	0.01 (0.06)	0.09* (0.05)	0.02 (0.05)	0.07 (0.05)	0.07 (0.05)
Age	−0.18*** (0.05)	0.07 (0.06)	−0.18** (0.06)	0.04 (0.05)	−0.19** (0.05)	0.05 (0.06)	−0.01 (0.05)	0.00 (0.05)	−0.01 (0.05)	0.01 (0.05)
Higher education	0.03 (0.05)	0.02 (0.05)	0.04 (0.05)	0.03 (0.04)	0.05 (0.05)	0.03 (0.06)	0.02 (0.04)	0.04 (0.04)	0.02 (0.04)	0.03 (0.04)
Number of vacation days ^a	−0.08* (0.03)	0.04 (0.04)	−0.06 (0.04)	0.01 (0.03)	−0.06 (0.04)	0.06 (0.04)	−0.06 (0.04)	0.06 (0.04)	−0.05 (0.04)	0.04 (0.04)
Indirect effects of being a solo entrepreneur										
Total indirect effect			0.03 (0.04)	−0.12* (0.05)	0.00 (0.01)	0.01 (0.01)	−0.35*** (0.09)	0.01 (0.05)	−0.31** (0.10)	−0.08 (0.06)
Via job autonomy			−0.01 (0.01)	0.02 (0.01)					−0.01 (0.01)	0.01 (0.01)
Via psychological capital			0.03 (0.01)	−0.10** (0.03)					0.03* (0.01)	−0.09** (0.03)

(continued on next page)

Table 5 (continued)

	(1)		(2)		(3)		(4)		(5)	
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
Via administrative tasks							−0.00 (0.01)	0.00 (0.01)	−0.00 (0.01)	0.00 (0.01)
Via role ambiguity							−0.00 (0.01)	0.01 (0.03)	0.00 (0.00)	0.01 (0.01)
Via role overload							−0.12*** (0.03)	0.05** (0.02)	−0.12*** (0.03)	0.05** (0.02)
Via time pressure							−0.04 (0.02)	−0.05** (0.02)	−0.05* (0.02)	−0.05** (0.02)
Via workload							−0.02 (0.01)	−0.01 (0.01)	−0.02 (0.01)	0.00 (0.01)
Via psychological detachment					0.00 (0.00)	0.01 (0.01)			−0.00 (0.00)	0.01 (0.01)
Observations	1137		745		745		745		745	
Individuals	361		348		348		348		348	
R-squared	0.08	0.01	0.12	0.27	0.09	0.03	0.36	0.32	0.38	0.36

Notes: Smaller sample sizes in Models 2–4 are due to the use of lagged variables and missing values on the mediators of 13 individuals. Maximum-likelihood estimates were made. Standardized coefficients with cluster-robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 5 %, 1 %, and 0.1 % levels (two-tailed), respectively. Both dependent variables are from Wave *t*, whereas all time-variant predictors are from Wave *t*−1.

^a Logarithmic transformation was used in the analysis.

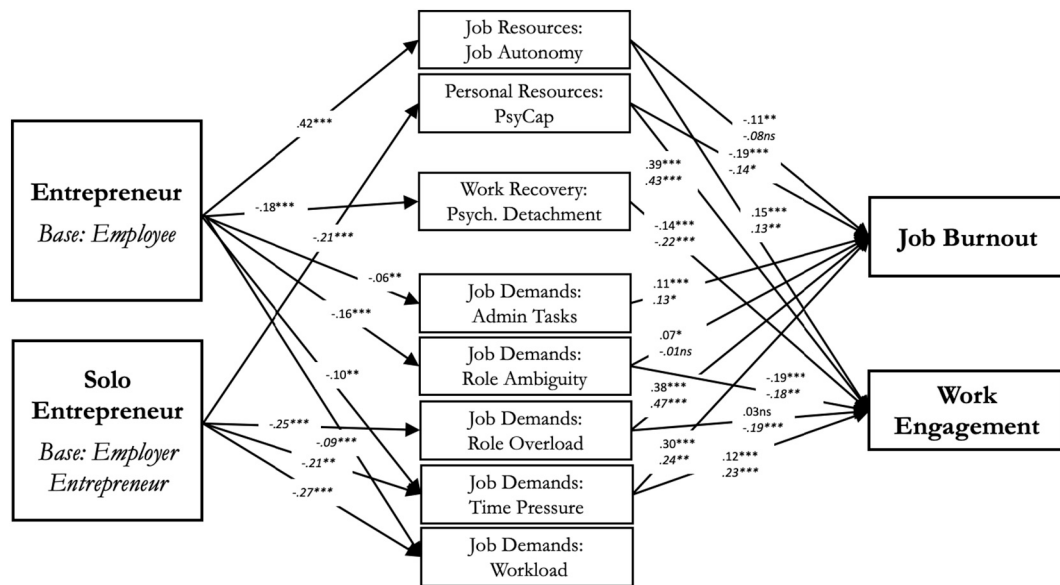


Fig. 3. Regression coefficients for the indirect pathways.

Note: The coefficients in italics refer to the regression analysis comparing solo vs. employer entrepreneurs (Table 5), and the other coefficients to the regression comparing self-employed with employees (Table 4). Only indirect effects are depicted (Table 4 shows one direct effect—from entrepreneur to work engagement). *, **, and *** denote statistical significance at the 5 %, 1 %, and 0.1 % levels, respectively.

entrepreneurs are indeed more engaged. Moreover, we found support for Hypothesis 2a, suggesting that the ‘autonomy’ job resource is a significant mediator of the effect on work engagement of being an entrepreneur, in comparison to being an employee, yet the data do not confirm a mediating effect of the ‘psychological capital’ personal resource as expected in Hypothesis 2b. In addition, we find that work recovery is a significant mediator in this context.

The first model in Table 5 examines Hypothesis 3: whether solo entrepreneurs have lower levels of job burnout than employer entrepreneurs. The coefficient of the solo entrepreneur dummy is indeed negative and significant at the $p < 0.05$ level in Model 1. Moreover, we found that the ‘role overload’ and ‘time pressure at work’ job demands do indeed significantly mediate the effect of being a solo entrepreneur on job burnout. This supports Hypothesis 3.

Furthermore, our analyses identified several unexpected mediation effects, which we will discuss in the Discussion and implications section.

4.3.2. Sensitivity analysis

We estimated additional models to examine the robustness of our results for different classifications of employees and entrepreneurs. The full sensitivity analysis is reported in the Appendix. In terms of entrepreneur-employee comparisons, we compared entrepreneurs with corporate entrepreneurs, and employer entrepreneurs with salaried managers. In each of these comparisons, we sought to reduce the heterogeneity of the groups being compared. Aside from minor differences, the substantive results of these comparisons are very similar to those in Model 5 in Table 4. Furthermore, we compared additional groups within the entrepreneur subsample: novice vs. serial entrepreneurs; owners of young vs. mature firms; and solo entrepreneurs vs. entrepreneurs who employ 1–4 people or those who employ 5 or more people. We did not find any significant differences between novice and serial entrepreneurs in terms of our model. We found that entrepreneurs in young firms reported lower levels of work engagement than their counterparts in mature firms. Moreover, we found similar differences between the solo entrepreneurs and entrepreneurs with 1–4 employees, as shown in Model 5 in Table 5. At the same time, we did not find any significant differences between employer entrepreneurs with 1–4 or 5 or more employees. Thus, in terms of predicting job burnout and work engagement in entrepreneurs, the relevant difference lies in whether or not those individuals have employees, while the number of employees itself does not matter. This is an important finding, as one could argue that firm size (and not solo vs. employer entrepreneurs) plays a key role in stress and motivation processes.

5. Discussion and implications

An entrepreneur's healthy, continual work engagement is widely regarded as a key ingredient in the entrepreneurial process (Schumpeter, 1934; Shane et al., 2003). At the same time, debate exists in the literature of whether (and why) entrepreneurship is associated with major psychological costs of such work engagement (e.g., high stress or mental health impairments; Lerman et al., 2020; Stephan, 2018; see also Baron et al., 2016; Hessels et al., 2017). A rather different perspective, however, would ask whether strong work engagement in entrepreneurship is associated with more positive personal outcomes, such as outstanding psychological utility, while avoiding negative outcomes (Benz and Frey, 2008; Douglas and Shepherd, 2000; Lévesque et al., 2002; Monsen et al.,

2010; Van Praag and Versloot, 2007). The present study addressed this positive perspective by developing and testing a research model focusing on stress, motivation, and recovery processes. This was used not only to predict concrete job burnout (strain and overtaxing from work) and work engagement (the positive, fulfilling work-focused mental state), but also, from a holistic view, to ultimately validate our framework of psychological utility that asks how entrepreneurs are empowered to maximize utility through their personal agency.

Utility is a complex phenomenon, as also becomes evident in the theoretical and empirical complexity of our research model. We combined theories and approaches from occupational health psychology in a novel way to develop and test a theoretical model specifically designed for entrepreneurship (“from theories for employees to a theory of entrepreneurial work”, Stephan, 2018, p. 308). While previous studies have focused either on entrepreneurial stress (Hessels et al., 2017; Wei et al., 2015), work engagement (Mäkinen et al., 2020; Shir et al., 2019; Stephan, 2018), or work recovery (e.g., Wach et al., 2021; Williamson et al., 2021), our study develops a more holistic and integrated understanding. We have indeed been able to explain substantially larger shares of the variance in our outcome variables (e.g., in our burnout variable) than, for example, previous entrepreneurship studies predicting stress levels (e.g., Baron et al., 2016; Hessels et al., 2017). We summarize our core results as follows:

5.1. Psychological utility of entrepreneurship

We started with a novel theoretical framework (Fig. 1) that explains why entrepreneurship, compared to paid employment, offers outstanding psychological utility, finding this to be due to a positive JD-R pattern, but also because it better enables entrepreneurs to derive and maximize their psychological utility proactively as part of their own agency and personal mastery—both during and after ‘official’ working hours (see also Table 1). While there is no clear evidence in the literature that the main value of entrepreneurship (for the average entrepreneur) would lie in outstanding *economic* utility (Åstebro and Chen, 2014; Van Praag and Versloot, 2007), evidence is now mounting that it offers outstanding *psychological* utility, something that entrepreneurs can control and thrive on, and which intrinsically motivates them (Frey et al., 2004). In other words, *how* entrepreneurs engage in their work (which is also essential for the success of their business) revolves around this non-economic value of entrepreneurship—and this is a key message of our study. It was particularly our holistic focus that enabled us to arrive at these conclusions. Interestingly, our study also postulates and confirms some of the central processes involved in *why* entrepreneurs tend to show better utility *outcomes* (such as higher job satisfaction) than non-entrepreneurs (Benz and Frey, 2008; Stephan, 2018; Van Praag and Versloot, 2007). While it remains a matter of debate as to why exactly entrepreneurs are often more satisfied with their work, we have here added a novel theoretical perspective.

Beyond these broader implications for utility, testing our research model has also delivered more specific insights into stress, motivation, and recovery mechanisms in entrepreneurs, all of which are distinct research areas in contemporary entrepreneurship research. Hence, we deem it important to discuss these individual implications in greater detail.

5.2. Results referring to stress, motivation, and recovery processes

First, our implications for stress research are the following: With our data we found no support for an underlying assumption in the literature that entrepreneurship could often lead to toxic stress levels, discovering instead that entrepreneurs on average show *less* job burnout than employed individuals; and solo entrepreneurs in particular exhibit the lowest risk among all entrepreneurs. These findings add to those prior studies indicating that entrepreneurs experience less negative work stress than non-entrepreneurs (Baron et al., 2016; Hessels et al., 2017), and it specifically challenges those studies that have found entrepreneurs to be more stressed and in particular need for regular work recovery.

Our *Hypothesis 1* stipulated that opposing mediation (MacKinnon, Fairchild & Fritz, 2007; Murayama and Elliot, 2012) operates within the conceptual link between entrepreneurship and burnout. On the one hand, entrepreneurs might be better protected from burnout due to better resources—namely, job and personal resources. We proved this mechanism to be true in our sample, yet only for job resources (autonomy) and not for personal resources (psychological capital).⁸ Other than expected, we also found that job demands mediated the link between entrepreneurship and burnout: entrepreneurs experienced *fewer* job demands that were predictive of burnout in our analysis (e.g., administrative tasks, role ambiguity, and time pressure). This finding, again, contradicts previous assumptions in the literature on the presence of particularly stressful job demands in entrepreneurs. It underscores our general assumption that entrepreneurship, on average, represents a rather positive JD-R pattern (Table 1).

On the other hand, however, entrepreneurs might be at risk of burnout due to a continuous lack of daily recovery from work (in a high engagement job). While we indeed found that entrepreneurs report less psychological detachment from their daily work in comparison to employees, this did not turn out to be a valid mediator—work recovery had no effect on burnout in our analysis. In other words, although entrepreneurs appear to recover less well from their daily work, factors highlighted in the JD-R model, such as job resources and job demands, are more important for their (lower) burnout levels. Given that we found that entrepreneurs face less stressful job demands even as they benefit from more job autonomy, it could be assumed that they may need less recovery than employees do, for example. Moreover, recent research in occupational health psychology indicates that, in the context of high autonomous work motivation, such psychological detachment from work is less useful (Olafsen and Bentzen, 2020). Finally, a further reason for this reduced off-work recovery could, as discussed earlier, lie in (as yet unknown) potential psychological costs, such as

⁸ Intriguingly, our study reveals that entrepreneurs do not differ in psychological capital from non-entrepreneurs, but that they might use this (similar) psychological capital in different ways (e.g., to derive more psychological utility; see Fig. 1).

switching off-on costs and associated loss of control (Table 1). In other words, entrepreneurs might actually have an intrinsic interest in avoiding a complete psychological detachment from their daily work. This has important implications for work recovery research and interventions in the wider domain of entrepreneurship (Wach et al., 2021; Williamson et al., 2021).

Beyond this, our study also significantly contributes to the wider literature on job burnout (Cordes and Dougherty, 1993; Bakker and Demerouti, 2017). We add to the debates by asking, for example, whether strong motivation and engagement at work could have a dark side in terms of burnout; and how engaged, passionate individuals can be protected from such risks while retaining their engagement (e.g., Vallerand et al., 2010). We also illustrate that a comparison of entrepreneurs with non-entrepreneurs generates important new insights for the broader JD-R and work recovery literatures, for example in terms of how job demands and resources may operate in comparison to recovery processes (Bennett et al., 2018; Kinnunen et al., 2011). From a JD-R and work recovery perspective, entrepreneurship forms a particularly interesting study context (compared to other ‘occupations’ and types of jobs) for delving into the combination of energizing processes that serve to maintain high work engagement while generating protective factors that avoid ill-being such as burnout. For instance, these insights could be applied to job redesign and job crafting for employed workers at risk (e.g., nurses, teachers, or police officers).

Second, our study delivers concrete implications for research on entrepreneurial motivation. The data showed that entrepreneurs are more engaged (an obvious finding, although it has yet to be demonstrated clearly in entrepreneurship research), and that job resources (autonomy), yet not personal resources (psychological capital), mediated this relationship. This reflects the motivation process described in JD-R theory, and highlights the role of job resources as a motivational driver of entrepreneurship, so far largely overlooked in models of entrepreneurial motivation (e.g., Shane et al., 2003).

While other studies point to the potentially negative dynamics of entrepreneurial over-engagement (e.g., Stroe et al., 2018), the present analysis indicates that entrepreneurs, in general, might not show toxic over-engagement (and overburdened passion) for their work, but instead a rather healthy strong work engagement (fueled by their personal agency and rewarded by psychological utility). Interestingly, and contrary to expectations, work recovery also turned out to be a valid mediator. While previous studies in occupational health research (Kinnunen et al., 2011) found no effect of psychological detachment from work on work engagement, our present analysis confirms precisely such an effect.

Third, our results add further insights into the recovery processes relevant for entrepreneurs. Our study is the first to show that entrepreneurs indeed engage less in off-work recovery (for the potential reasons discussed above). While this might place them at risk for toxic stress, it actually seems rather adaptive. This challenges the broad consensus in occupational health psychology that holds that off-work recovery via psychological detachment from work is one of the most important and effective recovery processes (Sonnentag et al., 2022). At least for entrepreneurs, this simply might not apply. Entrepreneurs might benefit from other types of recovery—for example, they might enjoy more freedom than employees in arranging sufficient *at-work* recovery (Chan et al., 2022), for instance via job crafting (Zhang and Parker, 2019). We may also ask whether entrepreneurs use a form of recovery after their daily work other than psychological detachment, e.g., those physical or social leisure activities that would still allow them to be attached mentally to their entrepreneurial work by staying switched-on. Future research might also find it worthwhile to test a potential dark side of a lack of off-work recovery in entrepreneurs, for example addressing workaholism and entrepreneurial addiction and whether such a lack of recovery is linked to these negative habits (Spivack and McKelvie, 2018). We speculate, however, that, on average, the positive psychological utility effects largely outweigh such risks, unless the entrepreneur is in critical circumstances (e.g., inevitable business failure and unrealistic, high work engagement despite such inevitable failure as a sign of negative workaholism and addiction; here disengagement and more work recovery might be necessary).

5.3. Solo entrepreneurship: the psychologically healthiest form of entrepreneurship

We also took a closer look at various types of entrepreneurs. We found that solo entrepreneurs can benefit from a particularly positive pattern of job demands and resources—as a consequence, this form of entrepreneurship may indeed be regarded as the most psychologically healthy. We call to mind that solo entrepreneurs showed high work engagement levels, as do employer entrepreneurs; hence, while having a similarly high work engagement level, the former face even fewer burnout manifestations than the latter type of entrepreneurs (due to the positive JD-R pattern with high job resources and low job demands).

Finally, in a return to our utility focus, if psychological utility as conceptualized in our study is indeed an important driver of entrepreneurship, our results indicate that this is particularly true for solo entrepreneurs. Hence, we can speculate that a main driver of why solo entrepreneurs run, and persist with, their businesses is precisely this exceptional psychological utility, which might also compensate them for less economic utility compared to running a bigger business with employees. Nevertheless, this better psychological utility could be an impediment to future business growth since individuals typically imbue avoiding a loss of existing benefits, such as experienced utility (Kahneman et al., 1997), with considerable value. This loss aversion (or endowment effect/status quo bias; Kahneman et al., 1991) might be particularly powerful in the context of risky choices (such as potential transition from solo to employer entrepreneurship). Hence, while psychological utility might come with a great deal of positive outcomes, a reference point that frames their future decision-making may be set at the moment entrepreneurs actually experience this utility (Kahneman et al., 1991). Previous entrepreneurship research indicates that such beliefs and expectations concerning the effect of future growth on well-being and stress levels shape entrepreneurs' attitude toward growth more than economic expectations (Wiklund et al., 2003). We thus ask: Does solo entrepreneurship represent a ‘utility gap’ where solo entrepreneurs refrain from business growth because of loss aversion? And, can an increase in personal resources (e.g., psychological capital), as identified in our study, empower entrepreneurs to take the plunge and grow the business, despite such utility loss and potential stressors also for their (future) employees (Wiklund et al., 2003)?

5.4. Practical implications

JD-R studies are well-suited to delivering a host of practical implications, such as those related to potential job redesign, where an organization changes job demands and resources to make them more favorable for employees, or job crafting, where individual employees actively change the design of their jobs (see Bakker and Demerouti, 2017; Zhang and Parker, 2019). Such research would also serve to inform interventions and training, for example for those groups especially at risk of burnout or low motivation.

This notwithstanding, the present study's fairly positive findings in terms of stress and motivation in entrepreneurs reveal the lack of a strong necessity for such improvements in the real world—at least when compared to employees. Nevertheless, our study hints at potential risk factors present in entrepreneurs that may take time to unfold, such as the identified habitual lack of off-work recovery (which could become problematic at critical moments of personal business failure or macro-level crises for example) or the growing job demands and decreasing job resources that appear when transitioning from being a solo entrepreneur to running a larger business with employees (which could also amplify issues resulting from lack of work recovery during critical periods). Entrepreneurs should be encouraged to be prepared to seek adequate work recovery, if required (Wach et al., 2021; Williamson et al., 2021). Future research should also take a closer look at the effect of active job-crafting in entrepreneurs in terms of their stress and motivation processes—something which has recently been included in the JD-R model (Bakker and Demerouti, 2017). This could also help inferring additional practical implications in this regard.

Finally, entrepreneurs growing their business by employing staff could also consider our implications for employed work. As shown in our study, employed individuals are at greater risk of burnout due to the more negative JD-R pattern; and proper off-work recovery is clearly vital. Hence, entrepreneurs could not only employ job-crafting for their own work, but should also empower their employees to do likewise.

5.5. Limitations

Our study has several limitations. First, we conducted our research prior to the COVID-19 pandemic, and it stands to reason that such a major disruptive crisis affects stress and motivational processes, for example by being particularly detrimental to solo entrepreneurs (Block et al., 2020). Hence, whereas our study established that solo entrepreneurs show an especially positive psychological pattern in general, this could be essentially reversed during a major crisis, and early indications exist in the literature that entrepreneurs have faced stronger burnout during the COVID-19 period than before the crisis (Torres et al., 2021). Our model and results could help explain such an apparent increase in burnout among entrepreneurs. Due to the crisis entrepreneurs may face two new risk factors: more work demands and economics risks, and the habitually low recovery from work that is associated with low psychological detachment from the fresh challenges connected to their work in times of major crisis. In other words, the latent risk factor of low recovery might shift to become a manifest risk during a crisis.

Second, our study did not examine the micro-processes shaping stress and work engagement across daily cycles (e.g., Wach et al., 2021). We focused on long-term patterns because they proved to be particularly important for personal and business outcomes, yet future research could also target potential gain/loss spirals (over both the short and long term).

Third, we neither studied potential interaction effects, for instance between resources and demands (Bakker and Demerouti, 2017), nor did we control for income (Baron et al., 2016). We acknowledge that recent versions of JD-R theory assume additional, more complex relationships than those considered in our research model, such as the direct effect of job burnout on work engagement or additional interaction effects between job demands, on the one hand, and job resources and personal resources on the other (Bakker and Demerouti, 2017; Bakker et al., 2014).

Fourth, in our data collection we focused solely on exhaustion as the cardinal indicator of job burnout, choosing not to study other dimensions of job burnout, such as cynicism and inefficacy (Maslach et al., 2001). Future research that builds on our model and results could easily incorporate these additional dimensions.

Lastly, we did not study ultimate well-being and job performance outcomes. For example, JD-R theory predicts that work engagement and burnout critically shape entrepreneurs' job performance. This notwithstanding, as reported above, we did find the expected correlations between job burnout and work engagement on the one side, and indicators of well-being and job performance on the other (life satisfaction, work satisfaction, and self-reported progress toward main work goals in the past two months). This is fully in line with our utility framework, where entrepreneurs' personal agency drives positive psychological outcomes (in addition to positive business outcomes that, in turn, also contribute to these psychological outcomes).

6. Conclusion

In wider public debate, yet also in scholarly discourse, entrepreneurs are often depicted as a type of 'gold hunters', who use their personal agency to hunt down and embrace the next opportunity, thereby generating and exploiting new economic activity (Shane, 2008). From a positive psychology perspective, however, this picture needs to be revised. Entrepreneurs not only mine economic, relatively uncertain utility, but are also miners of forms of relatively certain psychological utility.⁹ What is more, the latter might often be even more crucial as the driver for entrepreneurship, given that many entrepreneurs might earn more as employees, and that

⁹ Psychological utility is relatively certain because it is deeply embedded in the fundamental nature of entrepreneurial work (e.g., the positive JD-R pattern, as shown in our study).

striving for control is a fundamental human motive.

While our study also makes novel contributions to the specific stress, motivation, and recovery literatures, as well as to the solo entrepreneurship literature, we locate our main contribution in the revival and reinterpretation of utility as a key concept in the entrepreneurship literature. Entrepreneurs' psychological utility, and how they mine it, might play a more essential and complex role for their functioning and decision-making, but also for related business outcomes, than previously thought. In a way, this form of intrinsic self-interest¹⁰ reminds us of what Adam Smith (1776) referred to as the invisible hand in the economy. From this macro perspective, the collective maximization of psychological utility (when all mine their own 'gold of positive psychology') not only promises personal benefit in the entrepreneurial sector but also, more broadly, to the development of healthy, motivated, and well-rewarded entrepreneurs running their businesses, collectively generating broader social and economic benefits.

CRedit authorship contribution statement

Martin Obschonka: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Writing – Original Draft, Writing Review & Editing, Visualization, Supervision, Project administration

Ignacio Pavez: Conceptualization, Investigation, Writing – Original Draft, Writing Review & Editing

Teemu Kautonen: Conceptualization, Methodology, Software, Validation, Formal analysis, Writing – Original Draft, Writing Review & Editing

Ewald Kibler: Conceptualization, Methodology, Validation, Writing – Original Draft, Writing Review & Editing, Supervision, Project administration

Katariina Salmela-Aro: Conceptualization, Supervision, Project administration

Joakim Wincent: Supervision, Project administration, Funding acquisition

Data availability

The data that has been used is confidential.

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Appendix A

Table A1

Latent variable correlations, Cronbach's alphas, composite reliabilities (CR), and square roots of the average variance extracted (AVE, diagonal axis, italicized)^a.

	Alpha	CR	Job burnout	Work Engagement	Job resources (Autonomy)	Work recovery (Detachment)	Personal resources (Psychological capital)	Job demands (Role ambiguity)	Job demands (Role overload)	Job demands (Time pressure)
Job burnout (exhaustion)	0.93	0.92	<i>0.83</i>							
Work engagement	0.92	0.92	−0.42	<i>0.79</i>						
Job resources (autonomy)	0.87	0.87	−0.28	0.53	<i>0.72</i>					
Work recovery (detachment)	0.91	0.91	−0.18	−0.07	−0.07	<i>0.85</i>				
Personal resources (psychological capital)	0.89	0.92	−0.29	0.66	0.52	0.13	<i>0.86</i>			
Job demands										
Role ambiguity	0.82	0.90	0.31	−0.56	−0.51	−0.06	−0.60	<i>0.84</i>		
Role overload	0.72	0.74	0.57	−0.13	−0.13	−0.20	−0.10	0.17	<i>0.77</i>	
Time pressure	0.75	0.75	0.53	−0.03	−0.09	−0.26	−0.00	0.11	0.56	<i>0.78</i>

^a Note that this table excludes single-item measures of job demands because the quantities reported are only applicable to multi-item measures.

¹⁰ In a similar vein, Shane et al. (2003) refer to entrepreneurs' egoistic passion, with ego as a central motive for entrepreneurship.

Sensitivity analyses

Table A2 displays four models comparing entrepreneurs with employees. Model 1 is the same as Model 4 in Table 4: it compares all entrepreneurs with all employees in our data. This model is included for ease of comparability of the additional analyses with the main model.

Model 2 compares all entrepreneurs with corporate entrepreneurs. The latter were identified by the loose criterion of employees who are engaged in the launch of new products, services, processes, or lines/units of business. The main effect of being an independent entrepreneur on engagement has the same magnitude as in Model 1: independent entrepreneurs are more engaged with their work than corporate entrepreneurs. There is no direct effect on burnout in either of these models. The remaining effects are similar between Models 1 and 2, with the exception that the significance levels are generally lower in Model 2, owing most likely to the smaller sample used in its estimation. One difference worth noting is that psychological capital negatively mediates the effect on engagement in Model 2: independent entrepreneurs report lower levels of psychological capital than their corporate counterparts, and this negatively affects their engagement.

Model 3 contrasts employer entrepreneurs with salaried managers. As in the case of Model 2, the effects in Model 3 are similar to those in Model 1, albeit weaker (possibly owing to the smaller sample size in Model 3) and, hence, sometimes not statistically significant.

Model 4 compares solo entrepreneurs and employer entrepreneurs with all employees. The direct effects of being a solo entrepreneur or employer entrepreneur are almost the same: the coefficients have the same signs, significance, and magnitude as in Model 1 for all entrepreneurs. Thus, being a solo or employer entrepreneur is associated with a higher level of work engagement than being an employee, yet there is no significant effect on job burnout. Notably, there is no difference between the coefficients of solo and employer entrepreneurs. However, the indirect effects show two differences to Model 1: the mediating effects of solo and employer entrepreneur via psychological capital and role overload are significant in Model 4, whereas those effects are non-significant in Model 1.

Interestingly, the effects have opposite signs: the effect of being a solo entrepreneur on job burnout is positively mediated by psychological capital and negatively mediated by role overload, whereas the mediations are negative and positive, respectively, in the case of employer entrepreneurs. In contrast, the effect of being a solo entrepreneur on work engagement is negatively mediated by psychological capital and positively mediated by role overload, while these mediation effects are positive and negative, respectively, for employer entrepreneurs.

In summary, the additional analyses overall support the conclusions drawn from the main analyses in our study.

Table A2
Additional structural models comparing entrepreneurs with employees.

	(1) All entrepreneurs vs. all employees		(2) All entrepreneurs vs. corporate entrepreneurs		(3) Employer entrepreneurs vs. managers		(4) Solo/employer entrepreneurs vs. all employees	
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
Entrepreneur (base: employee)	−0.01 (0.03)	0.09*** (0.02)						
Entrepreneur (base: corporate entrepreneur)			0.02 (0.04)	0.09* (0.04)				
Employer entrepreneur (base: managers)					0.01 (0.03)	0.07* (0.03)		
Solo/employer entrepreneurs (base: employee)								
Solo entrepreneur							−0.01 (0.02)	0.09*** (0.02)
Employer entrepreneur							−0.01 (0.02)	0.08*** (0.02)
Job/personal resources								
Job autonomy _{t-1}	−0.11** (0.03)	0.15*** (0.03)	−0.09 (0.05)	0.10* (0.04)	−0.09* (0.04)	0.16*** (0.04)	−0.10** (0.03)	0.16*** (0.03)
Psychological capital _{t-1}	−0.19*** (0.03)	0.39*** (0.04)	−0.15** (0.05)	0.40*** (0.06)	−0.05 (0.04)	0.23*** (0.06)	−0.14*** (0.03)	0.34*** (0.03)
Job demands								
Administrative tasks _{t-1}	0.11*** (0.03)	−0.02 (0.02)	0.18*** (0.04)	−0.08* (0.04)	0.19*** (0.04)	−0.07* (0.03)	0.10*** (0.03)	−0.04 (0.02)
Role ambiguity _{t-1}	0.07* (0.03)	−0.19*** (0.04)	0.05 (0.05)	−0.27*** (0.06)	0.16*** (0.04)	−0.31*** (0.05)	0.11*** (0.03)	−0.28*** (0.03)
Role overload _{t-1}								

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Table A2 (continued)

	(1) All entrepreneurs vs. all employees		(2) All entrepreneurs vs. corporate entrepreneurs		(3) Employer entrepreneurs vs. managers		(4) Solo/employer entrepreneurs vs. all employees	
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
Time pressure _{t-1}	0.38*** (0.03)	0.03 (0.03)	0.45*** (0.05)	-0.11** (0.04)	0.34*** (0.04)	-0.00 (0.04)	0.31*** (0.02)	-0.05* (0.02)
Workload _{t-1}	0.30*** (0.03)	0.12*** (0.03)	0.22** (0.07)	0.18*** (0.05)	0.17*** (0.04)	0.04 (0.04)	0.24*** (0.03)	0.02 (0.02)
Work recovery	0.03 (0.02)	0.03 (0.02)	0.05 (0.03)	0.02 (0.03)	0.00 (0.03)	0.06 (0.03)	0.03 (0.02)	0.03 (0.02)
Psychological detachment _{t-1}	-0.05 (0.03)	-0.14*** (0.03)	-0.01 (0.04)	-0.13** (0.04)	-0.02 (0.04)	-0.09* (0.04)	-0.05* (0.03)	-0.11*** (0.02)
Control variables								
Female	0.03 (0.02)	0.04* (0.02)	0.05 (0.04)	0.05 (0.03)	0.03 (0.03)	0.06 (0.03)	0.02 (0.02)	0.03 (0.02)
Age	-0.02 (0.02)	0.03 (0.02)	-0.02 (0.04)	0.05 (0.04)	-0.05 (0.03)	0.04 (0.03)	-0.03 (0.02)	0.02 (0.02)
Higher education	-0.04 (0.02)	0.01 (0.02)	-0.02 (0.03)	0.01 (0.03)	-0.03 (0.03)	0.03 (0.03)	-0.03 (0.02)	0.02 (0.02)
Number of vacation days ^a	-0.04* (0.02)	0.01 (0.02)	-0.05 (0.03)	0.02 (0.03)	-0.02 (0.03)	0.03 (0.03)	-0.04 (0.02)	0.02 (0.02)
Indirect effect of being an entrepreneur vs. employee								
Total	-0.18** (0.06)	0.21*** (0.04)	-0.19** (0.07)	0.06 (0.06)	-0.08 (0.06)	0.13* (0.05)		
Via job autonomy	-0.04** (0.01)	0.06*** (0.01)	-0.03 (0.02)	0.04* (0.02)	-0.02* (0.01)	0.04** (0.01)		
Via psychological capital	0.00 (0.01)	-0.01 (0.01)	0.02 (0.01)	-0.04* (0.02)	0.00 (0.00)	-0.01 (0.01)		
Via administrative tasks	-0.01* (0.00)	0.00 (0.00)	-0.02* (0.01)	0.01 (0.01)	-0.03** (0.01)	0.01 (0.01)		
Via role ambiguity	-0.01* (0.00)	0.03*** (0.01)	-0.01 (0.01)	0.05** (0.02)	-0.01 (0.01)	0.03* (0.01)		
Via role overload	-0.00 (0.01)	-0.00 (0.00)	-0.03 (0.02)	0.01 (0.01)	0.03 (0.01)	-0.00 (0.00)		
Via time pressure	-0.03** (0.01)	-0.01* (0.01)	-0.03* (0.01)	-0.02* (0.01)	-0.01 (0.01)	-0.00 (0.00)		
Via workload	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)		
Via psychological detachment	0.01 (0.01)	0.03*** (0.01)	0.00 (0.01)	0.02* (0.01)	0.00 (0.00)	0.01 (0.01)		
Indirect effect of being a solo entrepreneur vs. employee								
Total							-0.23*** (0.06)	0.14** (0.05)
Via job autonomy							-0.03** (0.01)	0.05*** (0.01)
Via psychological capital							0.02** (0.01)	-0.04*** (0.01)
Via administrative tasks							-0.01* (0.00)	0.00 (0.00)
Via role ambiguity							-0.01** (0.00)	0.03*** (0.01)
Via role overload							-0.02** (0.01)	0.00 (0.00)
Via time pressure							-0.03*** (0.01)	-0.00 (0.00)
Via workload							-0.00 (0.00)	-0.01 (0.00)
Via psychological detachment							0.01 (0.00)	0.02*** (0.00)
Indirect effect of being an employer entrepreneur vs. employee								

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Table A2 (continued)

	(1) All entrepreneurs vs. all employees		(2) All entrepreneurs vs. corporate entrepreneurs		(3) Employer entrepreneurs vs. managers		(4) Solo/employer entrepreneurs vs. all employees	
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
Total							−0.04 (0.06)	0.26*** (0.05)
Via job autonomy							−0.02** (0.01)	0.04*** (0.01)
Via psychological capital							−0.01* (0.00)	0.02* (0.01)
Via administrative tasks							−0.00 (0.00)	0.00 (0.00)
Via role ambiguity							−0.01** (0.00)	0.03*** (0.01)
Via role overload							0.02** (0.01)	−0.00 (0.00)
Via time pressure							0.00 (0.01)	0.00 (0.00)
Via workload							0.00 (0.00)	0.00 (0.00)
Via psychological detachment							0.01 (0.00)	0.01** (0.00)
Observations	2928		1199		1204		2928	
Individuals	1350		622		553		1350	
R-squared	0.33	0.41	0.24	0.23	0.24	0.23	0.23	0.29

Notes: Maximum-likelihood estimates. Standardized coefficients with cluster-robust standard errors in parentheses. *, **, and *** denote statistical significance at the 5 %, 1 %, and 0.1 % levels (two-tailed), respectively. Both dependent variables are from Wave *t*, whereas all time-variant predictors are from Wave *t*−1.

^a Logarithmic transformation was used in the analysis.

Table A3 presents comparisons between different sub-groups within the entrepreneur sample. Again, Model 1 is the same as Model 4 in Table 5 and is included here to facilitate comparisons.

Model 2 compares novice and serial entrepreneurs. For the novice entrepreneurs, the current business is their first start-up, whereas the serial entrepreneurs have started one or more businesses in the past. Because neither the direct effects of the novice/serial entrepreneur variable nor any of the mediation effects are statistically significant, we can only conclude that there are no differences between novice and serial entrepreneurs in our study. We also ran the model by excluding firms aged 10 years or more, and another one limited to firms younger than 5 years. The rationale for this was based on the expectation of the effect of novice entrepreneurs being more prominent among young firms. However, the results remained the same, which supports the above conclusion of the insignificance of the novice/serial difference in the current context.

Model 3 compares young (under 5 years) and mature (5 years or more) firms. Interestingly, entrepreneurs running young firms experience less job burnout than owners of mature firms. While there are no significant mediation effects pertaining to burnout, the total mediated effect of running a young versus a mature firm on work engagement is negative. The mediation occurs via psychological capital and role ambiguity.

Model 4 expands upon Model 1 by dividing employer entrepreneurs into two groups: those with 1–4 employees (base category), and those with 5 or more employees. The direct effects of this extended firm size variable on job burnout and work engagement are non-significant. The mediated effects are shown in Table A4. Regarding job burnout, the only significant differences lie in the mediating effects of role overload and time pressure: solo entrepreneurs report less burnout because they experience less role overload and less time pressure, as compared to entrepreneurs who have 1–4 employees. The differences between entrepreneurs who employ 5 or more people compared to those with 1–4 employees are non-significant. In terms of work engagement, the engagement of solo entrepreneurs compared to entrepreneurs with 1–4 employees is positively affected by the lower levels of role overload, while it is negatively impacted by lower levels of psychological capital and, interestingly, by the lower levels of time pressure. Again, the differences between entrepreneurs who employ 1–4 versus 5 or more people are not significant. Therefore, for predicting the levels of job burnout and work engagement, the relevant threshold in our data is whether the entrepreneur has employees or not, whereas the size of the firm itself does not matter.

Table A3

Additional structural models with alternative categorizations of entrepreneurs (and their firms).

(1) Solo entrepreneurs vs. employer entrepreneurs	(2) Novice vs. serial entrepreneurs	(3) Young vs. mature firms	(4) Different firm sizes
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Table A3 (continued)

	(1) Solo entrepreneurs vs. employer entrepreneurs		(2) Novice vs. serial entrepreneurs		(3) Young vs. mature firms		(4) Different firm sizes	
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
Solo entrepreneur (base: employer entrepreneur)	0.08 (0.05)	0.01 (0.05)						
Novice entrepreneur (base: serial entrepreneur)			0.01 (0.04)	0.01 (0.04)				
Young firm (base: mature firm)					−0.08* (0.04)	0.03 (0.04)		
Firm size (base: 1–4 employees)								
Solo entrepreneur							0.03 (0.06)	0.03 (0.05)
5 or more employees							0.01 (0.05)	0.06 (0.05)
Job/personal resources								
Job autonomy _{t-1}	−0.08 (0.06)	0.13** (0.05)	−0.07 (0.05)	0.11* (0.05)	−0.08 (0.05)	0.11* (0.05)	−0.07 (0.05)	0.11* (0.05)
Psychological capital _{t-1}	−0.14* (0.06)	0.43*** (0.07)	−0.12* (0.05)	0.36*** (0.07)	−0.12* (0.05)	0.36*** (0.07)	−0.11* (0.05)	0.35*** (0.07)
Job demands								
Administrative tasks _{t-1}	0.13* (0.06)	−0.09 (0.04)	0.11* (0.05)	−0.09* (0.04)	0.11* (0.05)	−0.09* (0.04)	0.11* (0.05)	−0.09* (0.04)
Role ambiguity _{t-1}	−0.01 (0.05)	−0.18** (0.06)	0.01 (0.05)	−0.21*** (0.06)	0.02 (0.05)	−0.21*** (0.06)	0.01 (0.05)	−0.21*** (0.06)
Role overload _{t-1}	0.47*** (0.06)	−0.19*** (0.05)	0.34*** (0.05)	−0.12** (0.04)	0.33*** (0.05)	−0.12** (0.04)	0.34*** (0.05)	−0.13** (0.04)
Time pressure _{t-1}	0.24** (0.08)	0.23*** (0.05)	0.19*** (0.05)	0.18*** (0.04)	0.19*** (0.05)	0.18*** (0.04)	0.19*** (0.05)	0.18*** (0.04)
Workload _{t-1}	0.07 (0.05)	−0.01 (0.04)	0.06 (0.04)	−0.01 (0.04)	0.05 (0.04)	−0.01 (0.04)	0.06 (0.04)	−0.01 (0.04)
Work recovery								
Psychological detachment _{t-1}	0.04 (0.05)	−0.22*** (0.05)	0.02 (0.04)	−0.19*** (0.04)	0.02 (0.04)	−0.19*** (0.04)	0.02 (0.04)	−0.19*** (0.04)
Control variables								
Female	0.07 (0.05)	0.07 (0.05)	0.08 (0.05)	0.07 (0.05)	0.08 (0.05)	0.07 (0.05)	0.08 (0.05)	0.08 (0.05)
Age	−0.01 (0.05)	0.01 (0.05)	−0.06 (0.05)	0.00 (0.04)	−0.07 (0.05)	0.01 (0.04)	−0.06 (0.04)	0.01 (0.04)
Higher education	0.02 (0.04)	0.03 (0.04)	0.03 (0.04)	0.04 (0.04)	0.04 (0.04)	0.03 (0.04)	0.03 (0.04)	0.03 (0.04)
Number of vacation days ^a	−0.05 (0.04)	0.04 (0.04)	−0.05 (0.03)	0.06 (0.03)	−0.05 (0.03)	0.06 (0.03)	−0.05 (0.03)	0.06 (0.03)
Indirect effect of being an entrepreneur vs. employee								
Total	−0.31** (0.10)	−0.08 (0.06)	−0.11 (0.06)	0.06 (0.06)	−0.04 (0.07)	−0.14* (0.07)		
Via job autonomy	−0.01 (0.01)	0.01 (0.01)	−0.00 (0.00)	0.01 (0.01)	0.00 (0.00)	−0.01 (0.01)		
Via psychological capital	0.03* (0.01)	−0.09** (0.03)	−0.00 (0.01)	0.01 (0.02)	0.01 (0.01)	−0.04* (0.02)		
Via administrative tasks	−0.00 (0.01)	0.00 (0.01)	−0.01 (0.01)	0.01 (0.01)	−0.01 (0.01)	0.00 (0.01)		
Via role ambiguity	0.00 (0.00)	0.01 (0.01)	−0.00 (0.00)	0.02 (0.01)	0.00 (0.01)	−0.03* (0.01)		
Via role overload	−0.12*** (0.03)	0.05** (0.02)	−0.03 (0.02)	0.01 (0.01)	−0.02 (0.02)	0.01 (0.01)		
Via time pressure	−0.05* (0.02)	−0.05** (0.02)	−0.01 (0.01)	−0.01 (0.01)	−0.01 (0.01)	−0.01 (0.01)		
Via workload	−0.02 (0.01)	0.00 (0.01)	−0.00 (0.00)	−0.00 (0.00)	−0.00 (0.00)	0.00 (0.00)		

(continued on next page)

Table A3 (continued)

	(1) Solo entrepreneurs vs. employer entrepreneurs		(2) Novice vs. serial entrepreneurs		(3) Young vs. mature firms		(4) Different firm sizes	
	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement	Job burnout (exhaustion)	Work engagement
Via psychological detachment	−0.00 (0.00)	0.01 (0.01)	0.00 (0.00)	−0.00 (0.01)	0.01 (0.01)	−0.00 (0.01)		
Observations	745				745		745	
Individuals	348				348		348	
R-squared	0.38	0.36	0.25	0.28	0.26	0.28	0.25	0.28

Notes: Maximum-likelihood estimates. Standardized coefficients with cluster-robust standard errors in parentheses. *, **, and *** denote statistical significance at the 5 %, 1 %, and 0.1 % levels (two-tailed), respectively. Both dependent variables are from Wave *t*, whereas all time-variant predictors are from Wave *t*−1.

^a Logarithmic transformation was used in the analysis.

Table A4

Indirect effects of different firm sizes on job burnout and work engagement.

Mediator	Job burnout (exhaustion)		Work engagement	
	Solo entrepreneur (vs. 1–4 employees)	5+ employees (vs. 1–4 employees)	Solo entrepreneur (vs. 1–4 employees)	5+ employees vs. 1–4 employees
Total				
Job/personal resources				
Via job autonomy	−0.01 (0.01)	−0.00 (0.01)	0.01 (0.01)	0.00 (0.01)
Via psychological capital	0.02 (0.01)	−0.01 (0.01)	−0.05* (0.03)	0.04 (0.02)
Job demands				
Via administrative tasks	−0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	−0.00 (0.01)
Via role ambiguity	−0.00 (0.00)	−0.00 (0.00)	0.00 (0.01)	0.10 (0.01)
Via role overload	−0.06** (0.02)	0.02 (0.02)	0.02* (0.01)	−0.01 (0.01)
Via time pressure	−0.03* (0.01)	0.01 (0.01)	−0.03* (0.01)	0.01 (0.01)
Via workload	−0.02 (0.01)	0.00 (0.00)	0.00 (0.01)	−0.00 (0.00)
Via psychological detachment	0.00 (0.00)	0.00 (0.01)	−0.01 (0.01)	−0.02 (0.01)

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