

**Looking on the Bright and Dark Sides of Working Life: Appraisals of Work
Characteristics and Employee Outcomes**

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Appraisals of Work Characteristics and Employee Outcomes**

De positieve en negatieve kanten van werk nader bekeken: subjectieve
evaluaties van werkkenmerken en de relatie met welzijn en prestaties
(met een samenvatting in het Nederlands)

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Chapter 1

General Introduction

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Work stress

Nowadays, high levels of work stress are common throughout the world in many occupations. On average, 18% of employees experienced work-related stress every day in Europe (Automatic Data Processing, 2018), and in the United States, 83% of workers suffered from work stress (Milenkovic, 2019). Similarly, almost 80% of Chinese employees have experienced mental and physical stress at an average or higher level (ChinaDaily, 2018). Work stress involves costs for society, organizations, and employees. The estimated annual economic cost of work-related stress in Europe was 20,000 million Euros (European Agency for Safety and Health at Work, 2009). In the United States, 19% of workers had quit a previous position due to job stress (The National Institute for Occupational Safety and Health, 2006), and US businesses lose up to \$300 billion yearly because of workplace stress (Milenkovic, 2019). Work stress can be defined as “the process by which workplace psychological experiences and demands (stressors) produce both short-term (strains) and long-term changes in mental and physical health” (Ganster & Rosen, 2013, p. 1088). In the conceptualization of work stress, the usual predictor variables are called stressors, which are characteristics or events in the workplace environment that can evoke the stress process and cause strain (i.e., anxiety, exhaustion, depression, and burnout; Jex, 1998) or ill-well-being (e.g., McGrath & Beehr, 1990). As such, work stressors have become a research topic of increasing significance for both academics and practitioners (Cavanaugh et al., 2000; Hobfoll, 1989; Lazarus & Folkman, 1984).

Many theories and empirical studies in work and occupational health psychology have focused on the dark sides of work stressors. This literature reflects researchers’ beliefs that work stressors play a detrimental role in affecting people’s work experiences, well-being, and productivity. For instance, the Job demands-Control model (Karasek, 1979; Karasek & Theorell, 1990), the Job Demands-Resources model (Bakker & Demerouti, 2017), and the

Conservation Of Resources theory (Hobfoll, 1989) suggest that dealing with high levels of work stressors may deplete one's resources and could lead to burnout. Resources refer to "those objects, personal characteristics, conditions, or energies that are valued in their own right, or that are valued because they act as conduits to the achievement or protection of valued resources" (Hobfoll, 1988; Hobfoll, 2001, p. 339).

This stressor–strain perspective has often served as the theoretical foundation for explaining the negative impact of work stressors on individual affects, attitudes, and behaviors. Similarly, prior studies have shown that work-related stressors (e.g., role ambiguity, role conflict, and situational constraints) tend to be associated with (or even causally lead to) adverse outcomes, such as low levels of performance (Gilboa et al., 2008) and well-being (e.g., anxiety and job-related tension; Ganster & Rosen, 2013), and high levels of stress, strain and sickness absence (Lesener et al., 2018; Schaufeli & Taris, 2014, for reviews). However, recent meta-analyses also revealed contradictory results, reporting that stressors may not always be deleterious in terms of employee attitudes (e.g., work engagement; Crawford et al., 2010), task performance, and turnover (Podsakoff et al., 2007). Some studies reported unexpected positive, rather than negative, relationships between job stressors and outcomes such as work engagement (e.g., Bakker et al., 2005; Van den Broeck et al., 2010). These inconsistencies in the research findings suggest that existing theories linking work stressors to employee outcomes may be deficient. The set of studies presented in this dissertation aims to address these inconsistencies by using an appraisal-based approach. In the following sections, we first take a critical eye toward the literature. We then provide the rationale for our research purposes and describe each of our chapters in terms of how they address our research goals.

The Historical Roots of Challenge-Hindrane Stressor Model

Chapter 1

To account for the inconsistent results between work stressors and outcomes, some scholars suggest that the impact of stressors on outcomes can vary as a function of the intensity and the duration of a stressor. In particular, they stipulate non-linear relationships between job stressors and employee outcomes. For instance, the Yerkes-Dodson law (Yerkes & Dodson, 1908) states that the level of one's physiological arousal links to task performance in an inverted-U shape, such that the optimal mid-range level of arousal facilitates task performance. This model was used to support the idea that the relationships between work stressors and outcomes are non-linear (e.g., Jex, 1998). Similarly, JD-R scholars have argued that the relationship between workload, cognitive demands, and work outcomes may be an inverted U-shaped (Bakker et al., 2005; Mauno et al., 2007): where moderate levels of these job stressors would enhance work outcomes (e.g., work engagement) and fairly low or high levels would decrease their well-being (e.g., Bakker et al., 2005). However, such non-linear relations have received only limited empirical support (Rydstedt et al., 2006; Van den Broeck et al., 2010). Therefore, Taris (2006) argued that the well-tested idea of a quadratic relation represents an 'urban myth', which in the absence of convincing evidence to the contrary does not need further testing anymore.

Another explanation for the inconsistent results of work stressors draws on the nature of different types of stressors. Researchers argued that not all stressors are created equal and that some work stressors may have positive effects on employee outcomes (LePine et al., 2005; Van den Broeck et al., 2010). Historically, Selye (1956) argued that job stressor *type* determines the outcomes. He first used the typology of distress and eustress (Selye, 1956) to describe how different types of stressors influence employees differently. *Distress* refers to stressful situations that exceed one's resources, whereas *eustress* refers to stressful situations that can engage and energize individuals (Selye, 1956). This stream of literature was further expanded by the Challenge-Hindrance Stressor Model (CSHM). In particular, Cavanaugh et

al. (2000) differentiated between two types of stressors: challenge stressors and hindrance stressors, which are analogous to the eustress and distress of Selye (1956), respectively.

Challenge stressors refer to “work-related demands or circumstances that, although potentially stressful, have associated potential gains for individuals” (Cavanaugh et al., 1998, p. 6-7). Typical challenge stressors are time pressure, workload, and problem-solving demands (LePine et al., 2005). *Hindrance stressors* are “work related demands or circumstances that tend to constrain or interfere with an individual's work achievement, and which do not tend to be associated with potential gains for the individual” (Cavanaugh et al., 1998, p. 8). Examples of hindrance stressors are role conflict and organizational constraints (LePine et al., 2005).

Note that some scholars also used the concepts of job demands (Bakker & Demerouti, 2017; Van den Broeck et al., 2010), job demands stressors (e.g., Gilboa et al., 2008), and stressors interchangeably (LePine et al., 2016). Here we explain the relationships for these key concepts: job demands, job resources, and job stressors. In work psychology, a distinction is made between job demands and job resources (Bakker & Demerouti, 2017). *Job demands* refer to the physical, psychological, social, or organizational aspects of the job that require sustained physical and/ or psychological (cognitive and emotional) effort and that are therefore associated with certain physiological and/ or psychological costs (Bakker et al., 2004). *Job resources* are the physical, psychological, social, or organizational aspects of one's job that are functional in achieving work goals and/ or that stimulate personal growth and development (Bakker et al., 2004). This does not coincide with the commonly used term “job stressor”, which refers to anything in the workplace environment that could result in stress/strain (Jex, 1998), whereas job demands are the “things that have to be done” (Schaufeli & Bakker, 2004). Job demands do not necessarily negative, “they may turn into job stressors when meeting those demands requires high effort and is therefore associated with high costs

that elicit negative responses such as depression, anxiety, or burnout” (Schaufeli & Bakker, 2004, p.296). A lack of job resources could also be a stressor, just like high job demand. Researchers also suggested that job demand is a form of job stressor (Chen et al., 2017; Sonnentag et al., 2012). Therefore, we argue that although there is some overlap of these two terms, job stressor is a more general concept than job demand. Supporting the CHSM, several meta-analytic studies have shown that both types of stressors are associated with strain; whereas hindrance stressors have a negative effect on performance (Gilboa et al., 2008; LePine et al., 2005) and job satisfaction (Podsakoff et al., 2007), challenge stressors are positively related to motivation and performance (Crawford et al., 2010).

Although this model has obtained great popularity among researchers (Horan et al., 2020; O’Brien, & Beehr, 2019), some critical issues were raised. First and foremost, this model used an a priori categorization approach of work stressors, whereas the role of subjective appraisal has been largely ignored (González-Morales & Neves, 2015; Parker, 2014). This is an important omission, as individual appraisals determine the extent to which job stressors are experienced as more or less hindering or challenging (Lazarus & Folkman, 1984; Van den Broeck et al., 2010). Empirical studies also showed that appraisals can explain unique variance in outcomes beyond stressor-only models (Searle & Auton, 2015). Second, the categorization of stressors as either challenges or hindrances is not always consistent among scholars (e.g., Bakker & Sanz-Vergel, 2013). For example, Van den Broeck and colleagues conceptualized emotional demands as a hindrance stressor (Van den Broeck et al., 2010), while other researchers defined it as a challenge stressor (Bakker & Sanz-Vergel, 2013). Third, empirical evidence supporting the CHSM is mixed. A recent meta-analysis of 32 studies that specifically examined the relationships between challenge and hindrance stressors and important individual and organizational variables showed that these two types of stressors demonstrated similar dysfunctional effects on employee outcomes (e.g.,

counterproductive work behaviors, psychological strains, and physical health; Mazzola & Disselhorst, 2019). The authors suggested that the CHSM may not as valid as some researchers have claimed and that we should move to other well-established models such as appraisal-based approaches. Similarly, researchers argued that instead of distinguishing between some stressors as challenges and others as hindrances, it might be more useful to integrate appraisal theory to test how stressors will be appraised by individuals (Ohly & Fritz, 2010; Parker, 2014).

Therefore, the general purpose of this dissertation is to explain inconsistencies in the findings of previous research on the relationships between work stressors and employee outcomes. We focus particularly on the appraisals of work stressors and whether and how these will influence the relationships between work stressors and employee outcomes (e.g., work engagement, burnout, performance, and creativity).

The transactional stress theory

According to transactional stress theory (Lazarus & Folkman, 1984), the response to stressful events depends on how one appraises the situation. When confronted with an event, a person will evaluate how stressful the situation is (primary appraisal). Secondary appraisal occurs almost at the same time, and the basic question here is ‘Can I cope?’ In this stage, an individual assesses the extent to which his/her available resources are (in)sufficient to deal with the situation. Depending on the primary evaluation, the situation is perceived as more or less challenging or hindering, and drawing on the secondary evaluation, the outcome is perceived as either controllable or not (Lazarus & Folkman, 1984).

In the work context, building on CHSM and transactional stress theory, researchers posit that two types of appraisals determine how individuals respond to different work stressors: challenge appraisals and hindrance appraisals (LePine et al., 2005; LePine et al.,

2016). *Challenge appraisals* are defined as an individual's subjective interpretation that particular demands have the potential for personal gain, growth, development, and well-being (LePine et al., 2016). *Hindrance appraisals* refer to an individual's subjective interpretation that these demands or work circumstances have the potential to interfere with or obstruct/thwart an individual to achieve valued goals (Cavanaugh et al., 2000; Searle & Auton, 2015). Although these two types of appraisals can be distinguished from one another cognitively, they are not exclusive and can occur simultaneously in terms of a situational stressor (Lazarus & Folkman, 1984).

Research Aims

In the past two decades, with the popularity of CHSM, there is a growing research interest in work stressor appraisals. Prior studies have revealed that work stressors can be both appraised as challenges and hindrances to various degrees (e.g., Webster et al., 2011) and that there is a gain in including appraisals in work stressor research (Searle & Auton, 2015). Appraisals have been linked to a wide range of individual outcomes (e.g., task performance; LePine et al., 2016). Although previous studies contributed to the literature, several critical issues need further investigation. First, most previous empirical studies were conducted in western countries (e.g., the United States, LePine et al., 2016; Webster et al., 2011), meaning that it is unclear whether the results hold up in non-western countries (e.g., China). Researchers in psychology has been criticized for continuing to conduct studies involving 'WEIRD' people — individuals from Western-Educated-Industrialized-Rich-Democratic nations (Henrich et al., 2010). Therefore, the first goal of this dissertation is to extend existing research by examining the role of stressor appraisals in a different context, i.e., the Chinese context. By assessing how job stressors will generally be appraised in China (i.e., as challenging, hindering, or even both) insight into the degree to which stress appraisals generalize across cultures can be obtained.

In addition, building on transactional stress theory, appraisals have been treated as major mechanisms that account for the relationships between work stressors and important organizational and individual outcomes (Lazarus & Folkman, 1984). However, some researchers have suggested that although little research has reported that possibility, appraisals, as an individual difference factor, can also serve as a moderator in the relationship between job stressors and employee outcomes (O'Brien & Beehr, 2019). Apparently, the possible moderating effect of appraisals has been largely ignored. Therefore, the second goal of this dissertation is to test whether appraisals can also moderate particular stressor-outcome relationships.

Third, while previous studies have investigated the mediating role of appraisals, many studies still use an a priori categorization approach in investigating the challenge stressor-challenge appraisal-outcomes process and the hindrance stressor-hindrance appraisal-outcomes process (e.g., LePine et al., 2016). We argue that since employees can appraise certain work stressors both as challenging and hindering at the same time (Webster et al., 2011), different appraisals can show a “double-edged sword” effect in relation to employee outcomes. For example, Sessions et al. (2019) found that employee voice behavior has a negative indirect effect on supervisor emotional exhaustion through challenge appraisal, whereas it has a positive indirect effect on supervisor emotional exhaustion through hindrance appraisal. Thus, the third goal of this dissertation is to investigate the double-edged sword effect of appraisals.

Fourth, so far, very few studies have investigated the boundary conditions for work stressors and appraisals to affect particular outcomes. Especially the role of *leadership* has been largely ignored (for an exception, see LePine et al., 2016), even though it has been suggested that organizational leaders are crucial to employees and organizations (Bormann & Rowold, 2018), and leadership can build important resources by providing useful information

and support for their employees and can facilitate their challenge appraisals (Gutnick et al., 2012). Leadership is one of the most studied fields in social science (Antonakis et al., 2017). It is unfortunate that the role of leadership on employees' appraisal of work stressors has been largely ignored. In addition, previous research has not addressed the role of individual difference factors in the process of appraising work stressors (Ma et al., 2021). The transactional stress theory states that personal characteristics can be an important source of appraisals, which may alter the effects of stressors (Lazarus & Folkman, 1984). Thus, the fourth goal of this dissertation is to investigate how leadership type (e.g., servant and empowering leadership) and individual factors (e.g., promotion focus) can influence their appraisals.

Fifth, despite the burgeoning research on the appraisal of work stressors, empirical work on this topic has thus far been exclusively variable-centered, i.e., has focused on how different stressor appraisals (i.e., as a challenge or a hindrance) independently relate to particular work outcomes (e.g., Ohly & Fritz, 2010; Searle & Auton, 2015). Results of this type of study represent an averaged-estimate of the relationships between variables without systematically considering the possibility that the pattern of these relationships might differ meaningfully among subgroups of participants (Morin et al., 2011). Most importantly, this *variable-centered* approach ignores the possibility that there are subpopulations of employees who differ in the *combined* use of challenge and hindrance appraisals. This is an important gap, as the transactional stress theory states that different types of appraisals are not mutually exclusive (Lazarus & Folkman, 1984), which means that it is theoretically possible for individuals to appraise a particular stressor as both a challenge and a hindrance. It is reasonable to argue that some people perceive certain stressors as high-challenge and low-hindrance, while others perceive the same stressors as high-hindrance and low-challenge. Therefore, our fifth aim is to investigate appraisals of work stressors by using a variable-

centered approach to examine whether there are any subpopulations that appraise work stressors in a similar way and how different combinations of appraisals influence employee outcomes.

Finally, previous studies examined appraisals of work stressors mainly using cross-sectional designs (e.g., Webster et al., 2011). More sophisticated designs involving repeated and momentary measures of the concepts of interest (e.g., daily stressors, daily appraisal, and daily creativity) have remained absent, in spite of the fact that such designs allow researchers to study employee stressors and behaviors within the natural work context, capture the short-term dynamics of experiences, and investigate changes in variables (Ohly et al., 2010). Admittedly, there are several empirical studies that have shown appraisals of work stressor (e.g., Searle & Auton, 2015) to fluctuate across days. For instance, Ohly and Fritz (2010) found that daily time pressure and job control are perceived as challenging, and that challenge appraisal in turn is related to daily creativity and proactive behavior. However, these studies only focused on a limited number of work stressors. So, the final aim of this dissertation is to extend the existing literature by assessing daily appraisals of emerging work stressors (i.e., motivational demands) using a diary study design. This provides insight into the dynamics of stressor appraisals and the generalizability of the appraisal theory, while reducing retrospective bias (Bolger et al., 2003).

Outline of This Dissertation

To achieve these research aims, the current dissertation presents five empirical studies and two review papers (one systematic review and one meta-analysis) to understand how work stressors influence employee and organizational outcomes and shed more light on the role of appraisals (i.e., challenge and hindrance). The overall research framework is presented in

Figure 1. In the following sections, we will provide a brief summary of the chapters that compose this dissertation and how we achieved our research goals (see Table 1).

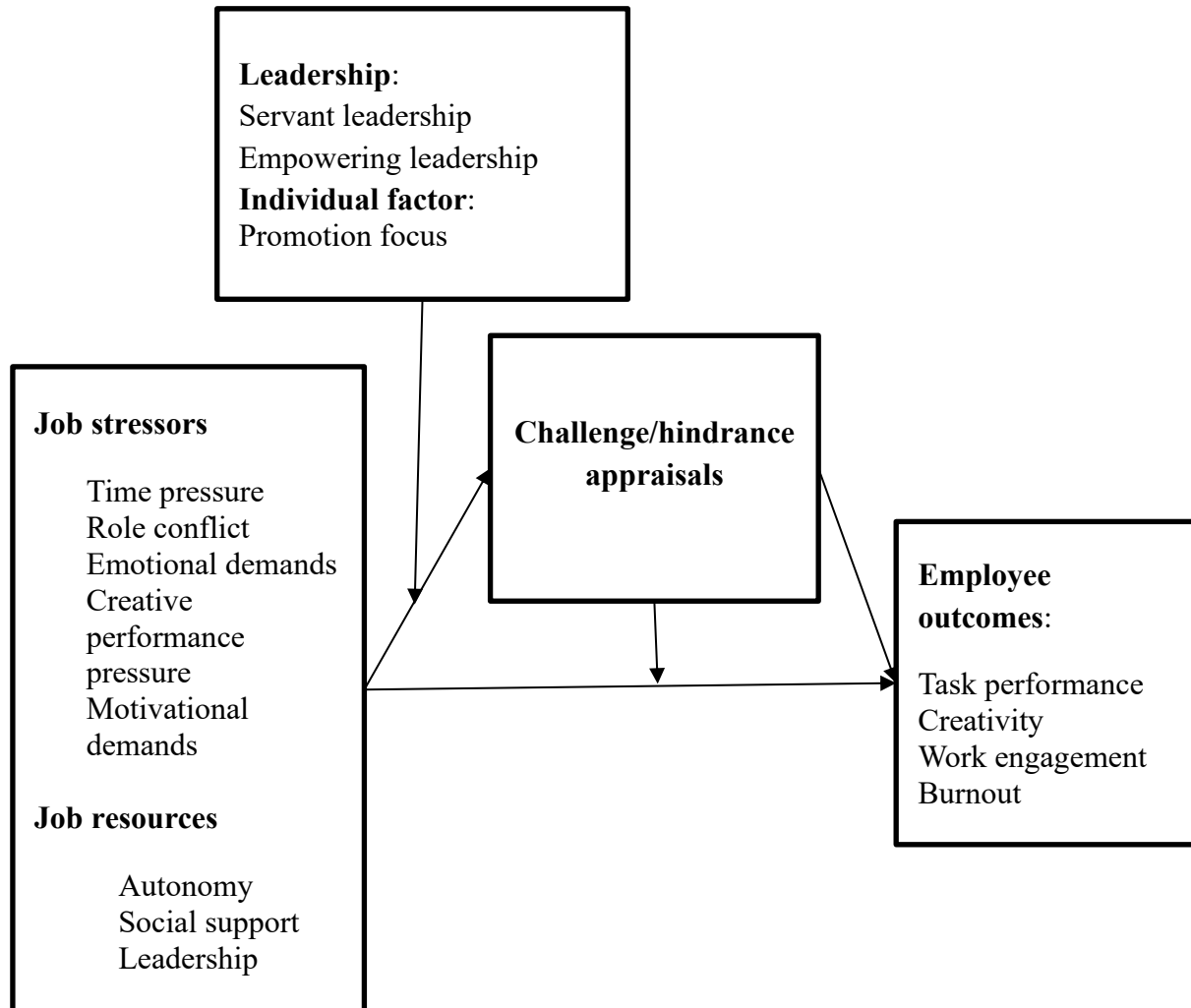


Figure 1. The Conceptual Model

Chapter 2 presents a systematic review of appraisal research in the work stressor literature. We first provide a brief overview of the historical development of the appraisal concepts. Next, we summarize and synthesize the empirical findings on 1) the antecedents of appraisals, 2) the outcomes of appraisals, 3) the role of appraisals (i.e., as a moderator or a mediator), and 4) the measurement of appraisals. Finally, by creating a comprehensive review

of prior literature on this topic, we provide a series of detailed suggestions for future appraisal research.

Table 1. *A Summary of Research Goals*

Aims	Relevant chapters
1. Assessing whether and how job stressors will be appraised in China.	3, 4, 5, 7, 8
2. Testing whether appraisals can also serve as a moderator of stressor-outcome relationships.	3, 4
3. Investigating the double-edged sword effect of appraisals.	7,8
4. Investigating the boundary conditions (i.e., leadership and individual factors) between work stressors and appraisals.	7,8
5. Using a variable-centered approach to examine appraisals and how different combinations of appraisals influence employee outcomes.	5
6. Assessing daily appraisals of emerging work stressors (i.e., motivational demands).	8

Chapter 3 explores (a) how employees appraise three different job stressors (time urgency, role conflict, and emotional demands) and (b) how stressor appraisals (i.e., as a challenge or as a hindrance) affect the relationship between job stressors and engagement/burnout. Instead of a priori categorizing job stressors as either a challenge or a hindrance, we argued that job stressors can be appraised as challenging and hindering simultaneously and that appraisals will moderate the relationship between job demands and employee outcomes. We used a multi-occupation cross-sectional study to test our hypotheses.

Chapter 1

This study extends research on job stressors within the challenge–hindrance framework by focusing on the moderating effects of appraisals.

Chapter 4 replicates and extends the results in Chapter 3 by examining (a) how workers appraise particular job characteristics (i.e., “job stressors” of time urgency, role conflict, and emotional demands; and “job resources” of autonomy, supervisor, and colleague support, and feedback), and (b) how these appraisals affect the relationships between these job characteristics and well-being (i.e., work engagement and burnout). In Chapter 3, we investigated whether job stressors can to some extent be appraised both as challenges and hindrances, and how individuals’ different appraisals influence the job stressors–employee well-being relationships. However, as employees face not only job stressors but also job resources in their work situation, we argue that the effects of job resources on well-being may also be contingent upon individual appraisal. We tested our hypotheses across two studies. The findings on the moderating effects of appraisal contribute to the literature by broadening the theory on job characteristics-outcomes relationships.

Chapter 5 extends these studies by using a longitudinal study design to investigate the long-term impact of appraisals. Most studies in the appraisal literature employ a variable-centered approach, which ignores the possibility that there may be subpopulations of employees who may differ in the combined use of challenge appraisal and hindrance appraisal. We thus investigated (a) the potential existence of distinct latent profiles of job demands appraisals (i.e., time urgency, role conflict, and emotional demands), (b) the outcomes associated with particular appraisal profiles, and (c) the stability of these profiles over time. In a two-wave study with a one-year time interval among Chinese workers we tested our hypotheses. The results in this chapter shed light on the nature of the appraisal of demands in the work context and how different employees use distinct combinations of appraisal to address their work demands.

Chapter 6 investigates the relationship between leadership and employee engagement. As we mentioned earlier, although leadership is frequently related to important organizational outcomes such as follower engagement, most of the previous appraisal literature has ignored the important role of leadership. To illustrate its importance, in this chapter, we conducted a meta-analysis to investigate how different leadership styles relate to employee engagement. In addition, to date, we have little insight into the degree to which the leadership–employee engagement relationship is contingent upon (a) types of leadership style and (b) national culture. In this chapter, we argue that national cultural characteristics will moderate the relationship between leadership and employee engagement. These issues are addressed in a meta-analysis involving participants from multiple countries.

Most previous studies have been focused on the appraisal of traditional well-established work stressors. However, we argue that emerging stressors in current jobs also deserve researchers' attention. Accordingly, in the last two chapters, we investigate how two new work stressors (i.e., creative performance pressure and motivational demands) will be appraised by employees and how leadership and individual factors influence the stressor-appraisal relationships.

Chapter 7 investigates the effect of creative performance pressure on employee creativity. Although creativity has widely been viewed as the cornerstone of organizational innovation and success, high pressure to be creative may have mixed implications for employee creativity. Our paper systematically conceptualizes creative performance pressure and develops the creative performance pressure scale for it, and assesses its psychometric properties across two samples (Study 1). In addition, in Study 2, we also investigate (a) how creative performance pressure influences employee creativity through different appraisals (i.e., challenge appraisal and hindrance appraisal) and (b) the moderating role of job and

Chapter 1

personal resource (i.e., servant leadership and promotion focus) in the stressor appraisal process.

Chapter 8 uses a diary study to investigate how daily motivational demands influence employee performance (task performance and creativity) and well-being (i.e., exhaustion) through daily appraisals. Since many of today's jobs (especially if employees are working from home) require employee themselves to “set their own goals, decide how hard they work to achieve that goal, and decide when the task is complete” (i.e., motivational demands; Taris & Hu, 2020). However, when and how motivational demands influence employee outcomes remains unclear. In this chapter, we argue that (a) the response to motivational demands depends on how one appraises them (i.e., appraisals will mediate the relationship between motivational demands and); and (b) job resource (empowering leadership) will moderate the relationship between motivational demands and appraisal (i.e., challenge and hindrance). We used a diary study from a Chinese sample to test our hypotheses.

Finally, in **Chapter 9**, we summarize the findings of our studies and discuss how this dissertation advances the theoretical development of appraisals and challenge-hindrance stressor framework and provides implications for practice.

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Chapter 2

Challenge, Hindrance, or Threat? A Systematic Review of Appraisal-Based Approaches in Work Stressor Research

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Abstract

Although the challenge-hindrance stressor model (CHSM) proposes that work stressors can be clearly divided into challenge and hindrance stressors, there has been mixed support for the model. Recently, researchers have called for moving away from the current CHSM to an appraisal-based approach. Thus, we conducted a comprehensive literature review to answer “what do we know and where do we go” of work stressor appraisal research. The results from 63 empirical studies with 70 samples ($N = 21,928$) showed that (1) work stressors can be appraised as challenges, threats, or hindrances; (2) challenge appraisals of work stressors generally have positive effects on employee work attitudes, well-being, job performance, behavior, and health-related outcomes; whereas hindrance, threat, and harm appraisals have negative effects on these outcomes; and (3) appraisals can both mediate and moderate the relationships between stressors and work outcomes. Building on the extant knowledge, we provide detailed suggestions for future research.

Keywords: Challenge stressor, hindrance stressor, challenge appraisal, threat appraisal, systematic review

Introduction

As business environments become increasingly competitive and uncertain, work stress has received increasing attention from scholars and practitioners (Bliese, Edwards, & Sonnentag, 2017). Over decades, researchers have tried to identify how different work stressors may have different implications for employees (Bakker & Demerouti, 2017; Podsakoff, LePine, & LePine, 2007). Work stressors refer to the features of jobs or workplaces that may trigger the stress process and which can cause employee strain (Tuckey, Searle, Boyd, Winefield, & Helen, 2015). The most well-known stressor typology examining these differences is the challenge-hindrance stressor model (CHSM) (Cavanaugh, Boswell, Roehling, & Boudreau, 2000). It splits stressors into two distinct categories: challenge stressors and hindrance stressors. Challenge stressors are defined as work-related demands or circumstances that provide opportunities for personal gain, growth, or mastery, whereas hindrance stressors are demands or circumstances that are likely to interfere with or thwart personal development and work-related achievement (LePine, Zhang, Crawford, & Rich, 2016). Since the development of the CHSM (Cavanaugh et al., 2000), it has gained great popularity among stressor researchers (O'Brien & Beehr, 2019). Several meta-analyses and empirical studies have confirmed that these two categories of stressors may relate to certain outcomes in different ways. Whereas hindrance stressors have dysfunctional relationships with job performance (e.g., Ma, Peng, & Wu, 2021) and work attitudes, challenge stressors have positive effects on job performance (LePine, Podsakoff, & LePine, 2005) and work attitudes (Podsakoff et al., 2007).

However, at present, the focus of challenge-hindrance stressor research revolves around the debate whether this framework is valid. On the one hand, O'Brien and Beehr (2019) have claimed that "the CHSM describes an accurate and practical distinction", which is in line with previous meta-analyses (e.g., LePine et al., 2005; Podsakoff et al., 2007). On

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the other hand, other researchers have argued that the CHSM as originally proposed is not consistently supported (Mazzola & Disselhorst, 2019). For example, in a meta-analysis by Clarke (2012), the expected positive effects of challenge stressors on safety behaviors and safety outcomes were not supported. Similarly, Mazzola and Disselhorst (2019) reviewed 32 studies that used the CHSM, finding that in most cases, challenge and hindrance stressors either had similar effects on outcomes, or that one was significant whereas the other was not (Spector, 2019). Additionally, recent empirical studies found that time pressure, as a typical “challenge stressor”, related negatively to work engagement, which suggests that this concept may sometimes work as a hindrance stressor (e.g., Baethge, Deci, Dettmers, & Rigotti, 2019; Gabriel et al., 2019; Kronenwett & Rigotti, 2019; Li, Taris, & Peeters, 2020). Finally, although the CHSM has provided an explanation of the differential effects of stressors (Cavanaugh et al., 2000), the prior categorization of challenge and hindrance stressors has been criticized by some scholars as it ignores the fact that the appraisal of a stressor might differ across individuals. Appraisals refer to an individual’s subjective interpretation of these stressors as having the potential for personal gain, growth or constraint or thwart one to achieve valued goals (LePine et al., 2016). For example, Li, Taris et al. (2020) argued that “one man’s meat can be another man’s poison”, and it has been shown that employees can appraise certain work stressors as challenging and hindering at the same time (e.g., emotional demands and time pressure, Kronenwett & Rigotti, 2020). This led researchers to conclude that the CHSM as originally proposed is not consistently supported and that work stress research should move away from the current CHSM in favor of other models (Mazzola & Disselhorst, 2019).

Interestingly, both sides in this debate tend to agree that an appraisal-based approach could be a fruitful way to proceed. Mazzola and Disselhorst (2019) have stated that we should favor a more appraisal-based approach instead of the CHSM. Similarly, O’Brien and Beehr

(2019) suggested that appraisals could regulate the influence of stressors on individuals (e.g., Huang, Chiaburu, Zhang, Li, & Grandey, 2015; Li, Taris et al., 2020). Also in related fields, researchers have called for an appraisal-based approach in workplace stressor (Searle & Auton, 2015; Webster, Beehr, & Love, 2011), emotion (Ashkanasy & Dorris, 2017), creativity (Gutnick, Walter, Nijstad, & De Dreu, 2012), and newcomer socialization research (Ellis et al., 2015). Answering these calls, there has been a growing interest in the role of stress appraisals in the field of work and organizational psychology (e.g., LePine et al., 2016; Li, Taris et al., 2020; Ma, Liu, Peng, & Xu, 2021; Mitchell, Greenbaum, Vogel, Mawritz, & Keating, 2019). However, the current literature about stress appraisal in the workplace lacks structure and coherence. Scholars have used different appraisal concepts and varying operationalization. And less attention has been paid to the different roles of stress appraisals in the workplace stress literature. Thus, a comprehensive review of the stress appraisal literature seems timely and valuable.

This research provides a systematic review of the appraisal literature in the organizational field. In order to differentiate between different constructs related to stressor appraisals, we first provide a brief overview of the historical development of the appraisal concepts. We then summarize and synthesize the empirical findings on 1) the antecedents of appraisal, 2) the outcomes of appraisals, 3) the role of appraisals (i.e., as a moderator or a mediator), and 4) the measurement of appraisals. Finally, by creating a comprehensive review of prior literature, we generate a series of detailed suggestions for future appraisal research.

Our study makes several contributions to the stress and appraisal literature. First, while there is a growing interest in work stress appraisal, research in this area is lacking an integrated framework of the antecedents and outcomes of appraisals. This review will provide a detailed nomological framework of appraisal literature and compare the different constructs related to stress appraisals. Second, we illuminate some of the major challenges related to

empirical developments in appraisal literature, such as the different roles of stress appraisals and the operationalization of stress appraisals. Third, we propose a new typology of stress appraisal and generate specific recommendations that may guide future developments in this area.

The Historical Development of Appraisals

Transactional Model of Stress and Coping

The transactional model of stress and coping states that stress may have positive or negative implications on individuals, depending on how one appraises the stressful events (Lazarus & Folkman, 1984). Stress occurs when demands in the work environment tax or exceed an individual's resources (Lazarus & Folkman, 1984). When a stressful event is encountered, one will evaluate the meaning and significance for his/her well-being (Lazarus & Folkman, 1984). There are two major forms of appraisals: (a) primary appraisal and (b) secondary appraisal. *Primary appraisal* refers to the process that an individual evaluates how stressful the situation is, which relates to an individual's judgements that an event or aspect of the environment is irrelevant (i.e., no significant influence for well-being), benign-positive (does not cost or exceed one's resources and signals only positive outcomes), or stressful (Folkman, 1984). Three types of appraisals have been identified in primary appraisal (i.e., harm/loss, challenge, and threat). *Harm/loss appraisal* refers to injury or damage already done, for instance, loss of a limb, cancer, disability, or loss of self-esteem. *Challenge appraisal* reflects one's perception of a situation as a potential opportunity for growth, mastery, or gain, whereas *threat appraisal* can be described as one's anticipated potential for harm or loss of a situation (Folkman, 1984). The distinction between harm/loss and threat appraisal is whether the damage or negative event did already happen (challenge and harm/loss) or not (threat appraisal).

Expanding the dimensionality of appraisals, researchers in this area combine the transactional model of stress (Lazarus & Folkman, 1984) and the CHSM (Cavanaugh et al., 2000), where several types of “appraisals” are being utilized (i.e., challenge, threat, and hindrance) (Tuckey et al., 2015). In particular, building on the CHSM model, researchers proposed a new type of appraisal that is hindrance appraisals, which refers to interpreting work-related demands or circumstances that tend to constrain or interfere with one’s personal development (LePine et al., 2016). This stream of research especially increased after the challenge-hindrance scale developed by Searle and Auton (2015) became available. So far, empirical studies have combined appraisals varies. For instance, some studies included challenge-hindrance appraisals (e.g., Ma, Peng et al., 2021) or challenge-threat appraisals (e.g., Mitchell et al., 2019). However, it should be noted that these three types of appraisals are not mutually exclusive, i.e. it is theoretically possible for individuals to appraise a stressful event simultaneously as harm/loss, threat, and challenge (Carpenter, 2016). For instance, diary studies have shown that emotional demands, skill demands, and work interruptions were appraised as both challenges, hindrances, and threats (Smith, DeNunzio, Haynes, & Thiele, 2020).

Secondary appraisal occurs almost at the same time when an individual assesses whether he/she can deal with the situation (answering the “what can I do” question) based on their resources (Folkman, 1984). This appraisal is essential because it determines a person’s perception of to what extent a situation can be changed or accepted (Folkman & Lazarus, 1980). In turn, this will determine how one will attempt to cope with the stressful situation (i.e. what the person will actually do). *Coping* is defined as a process in which individuals “constantly change cognitive and behavioral efforts to manage specific external and/or internal demands” (Lazarus & Folkman, 1984, p.141). There are two types of coping: (a) emotion-focused coping (i.e., the regulation of emotions or distress caused by the stressor),

and (b) problem-focused coping (i.e., the management of the problem within the stressful situation). When a person has concluded that nothing can be done to change a harmful, threatening, or challenging environmental condition, emotional-focused coping is more likely to occur. On the other hand, if a situation is appraised as amenable to change, problem-focused coping is more probable (Folkman & Lazarus, 1980; Lazarus & Folkman, 1984, p.150).

In order to enhance our understanding of the role of appraisals in the work stressor process, we conduct a systematic review of the appraisal literature in the organizational field. We first describe how we conducted our literature search. Next, we organize the existing literature to answer several questions: what are the antecedents of different appraisals (e.g., challenge, hindrance, and threat) of work stressors (*Question 1*)? What are the outcomes of different appraisals of work stressors (*Question 2*)? Do Appraisals act as a mediator and/or a moderator between work stressors and outcomes (*Question 3*)? What is the best way to measure appraisals of work stressors (*Question 4*)? Finally, based on the results of the present review, we discuss a number of directions for future research.

Method

To identify as many published and unpublished relevant studies as possible, we conducted three sets of searches. First, the online databases of Web of Science, PsycINFO, and Google Scholar were searched. Advanced search strategies were developed for each database accordingly. In line with Mazzola and Disselhorst (2019), we included key terms of “challenge stress,” “hindrance stress,” “challenge stressors,” “hindrance stressors,” “Cavanaugh,” and “Cavanaugh et al.,” “challenge demands”, and “hindrance demands”, combined with the terms “appraisal”, “challenge appraisal” and/or “hindrance appraisal”. In addition, we conducted a manual search in major journals that frequently publish work stress-

related research, specifically, we examined the *Anxiety, Stress & Coping*, *International Journal of Stress Management*, *Journal of Applied Psychology*, *Journal of Business and Psychology*, *Journal of Occupational Health Psychology*, *Journal of Organization Behavior*, and *Work & Stress*. The third set of searches focused on the identification of articles that cited the papers of Searle and Auton (2015) or Cavanaugh et al. (2000).

We included studies that (a) were written in English; (b) employed a quantitative design; (c) included at least one measure of appraisals (focusing on work-related stressors or demands); and (d) focused on employees. Both published and unpublished articles were taken into account. Based on these criteria, 708 articles were identified. Next, two authors independently screened these articles on suitability for this review based on their titles and abstracts, as presented on an online platform (<https://rayyan.qcri.org>). The primary agreement was 94% (3 conflicts among 50 screened articles, which was mainly because one coder included student samples, whereas the other did not). After discussion, we resolved the conflicts and ultimately reached an agreement of 100%. Next, the first author screened the remaining 658 articles, resulting in 164 potential articles. Second, two of the authors independently screened these 164 manuscripts in full. As a result, 55 papers were included. The primary search was conducted in December 2019, and we updated it in March 2021, which further found 7 new publications, ultimately 63 papers presenting 70 independent studies with 21,928 employees in total were included. Figure 1 presents a flowchart of the literature search process and the appendix Table provides an overview of all reviewed papers. Finally, two coders coded these papers, using a coding scheme developed by the first author. We coded the following information: bibliographic information, country of the sample, theoretical framework (i.e., antecedents, outcomes, and the role of appraisals), study design (e.g., sample size, measurement scale, data source, etc.). Overall, the Cohen's Kappa for the coding agreement was .79, indicating high agreement.

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Our review spans 17 years (2004 to 2021, Mean = 2016), and the majority of our reviewed articles used cross-sectional designs ($n = 36$). And 28 have used temporal separation measurement to test their models (time intervals ranged between 3 weeks to 17 months). Only one study used a panel design (i.e., Kaltiainen, Lipponen, Fugate, & Vakola, 2020), and 13 studies employed an experience-sampling design or diary design (e.g., Ma Peng et al., 2021; Ohly & Fritz, 2010; Searle & Auton, 2015), and 2 used experimental designs (1 field experiment, van Steenbergen, Ellemers, Haslam, & Urlings, 2008; 1 scenario experiment, Parker, Bell, Gagné, Carey, & Hilpert, 2019). Our review also found that 13/70 studies used multi-source measurement (e.g., Fugate, Prussia, & Kinicki, 2012; Li, Deng, Leung, & Zhao, 2017). The participants were from over 13 countries, and mostly from the United States ($n = 18$), China ($n = 14$), and Australia ($n = 9$). Due to the many different study designs that have been used, the results reported below cannot be interpreted as causality.

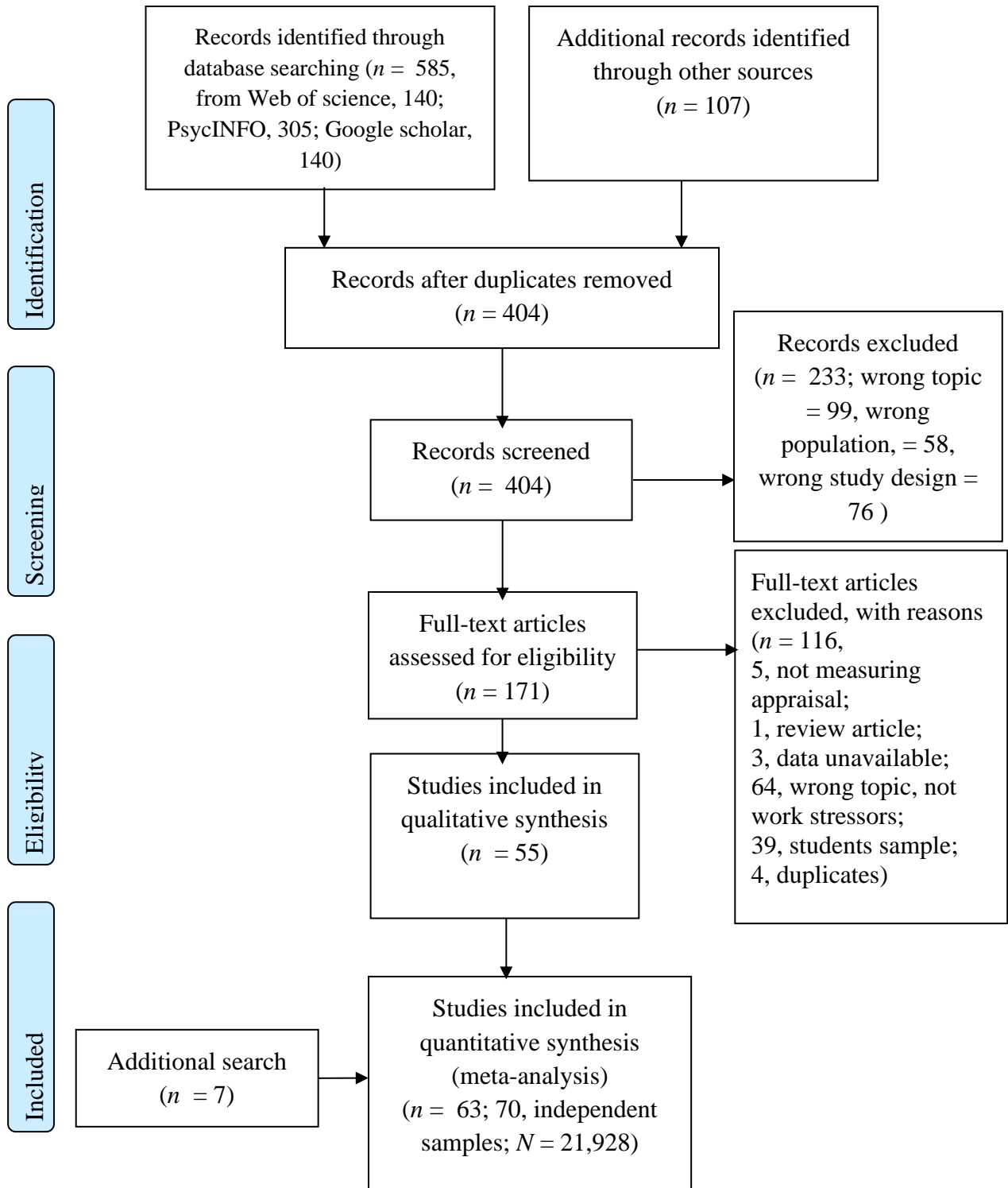


Figure 1. The flow diagram of literature searching process

Note: Figure adapted from Moher, Liberati, Tetzlaff, Altman, The PRISMA Group (2009).

Results

Drawing on our research questions, we have structured our review into four important sections. First, some work sheds light on why individuals have different appraisals. For this section, we discussed individuals' appraisals of work stressors, antecedents of appraisals (including social factors and individual characteristics on appraisals), and the moderators between stressors and appraisals. Second, a large body of research examines how different appraisals influence outcomes. In this section, we reviewed the literature about how appraisals related to five categorizations of work outcomes (i.e., performance, well-being, attitudes, behaviors, and health). Third, we identified research that focused on the moderating role and mediating role of appraisals. Finally, we summarized different measurements of appraisals and inquired into the best way of measuring appraisals.

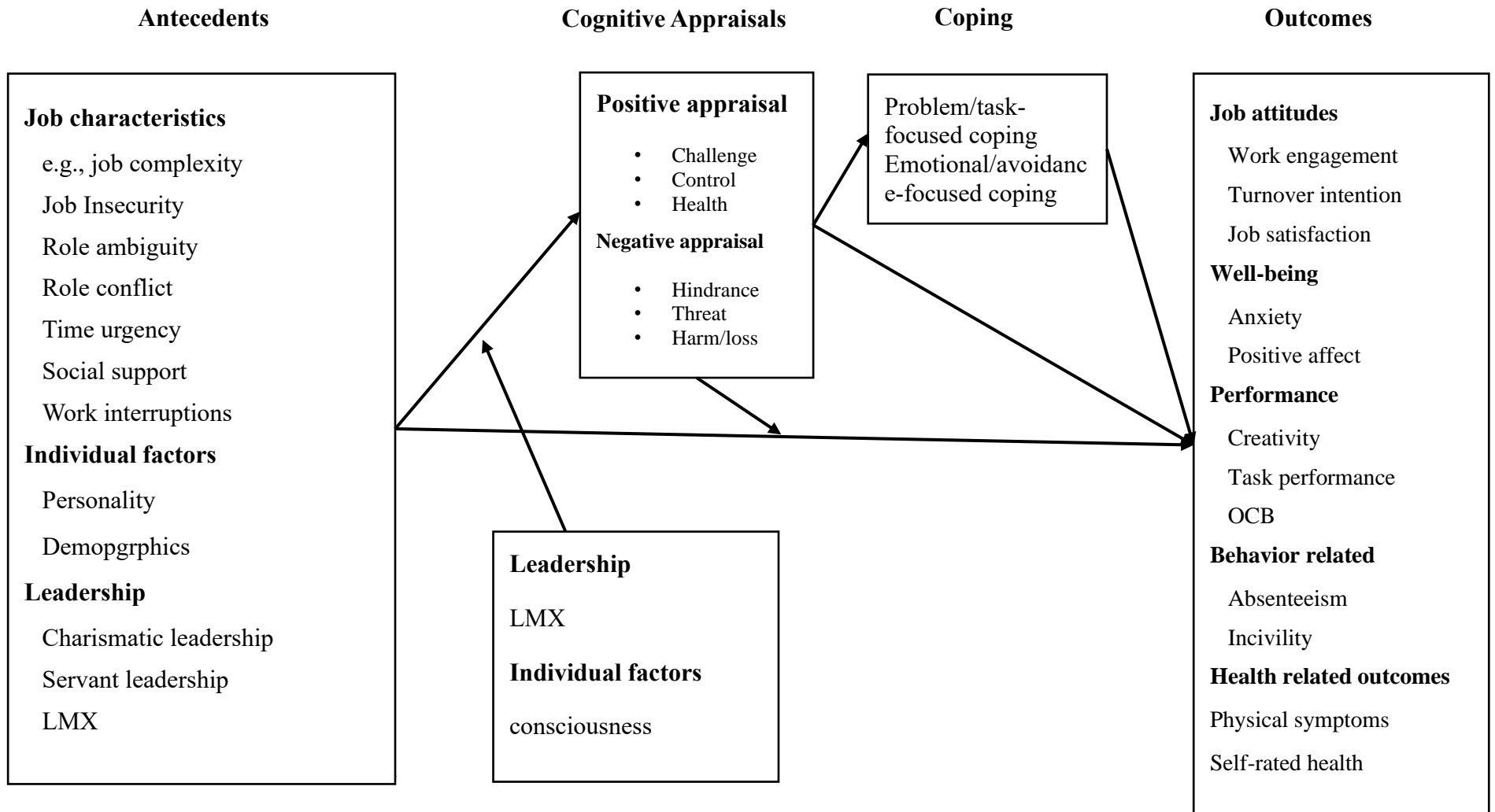


Figure 2. The Conceptual Framework

RQ 1: The antecedents of appraisals

Our first goal is to identify an array of antecedent variables of stress appraisals in the current literature (see Figure 2). We organize this section into four parts: (1) individual demographics and appraisals; (2) individuals' appraisal of work stressors; (3) the influence of social factors and individual characteristics on stress appraisals; (4) the moderators between work stressors and appraisals.

Individual demographics and appraisals. Nineteen of our included studies reported the associations between individual demographics and appraisals. However, the results were largely mixed. In particular, positive, negative, and non-significant correlations were reported between age, gender, education, and tenure, and challenge, hindrance, and threat appraisals, respectively. Overall, the correlations between individual demographics and appraisals were weak.

Appraisal of work stressors and job resources. One set of key findings of our review was regarding the appraisal of work stressors. Among the included studies, 31 studies included challenge-hindrance appraisals, 17 studies included challenge-threat appraisals, and 5 studies measured challenge-hindrance-threat appraisals (e.g., Smith et al., 2020). These studies showed that work stressors can be appraised as challenges, hindrances, and threats. For instance, Webster et al. (2011) found that workload, responsibility, role ambiguity, and role conflict could simultaneously be appraised as challenges and hindrances (for similar findings see LePine et al., 2016; Prem, Ohly, Kubicek, & Korunka, 2017; Searle & Auton, 2015). Goal difficulty (Espedido & Searle, 2018) and performance-based pay (Parker et al., 2019) can be appraised as challenges and threats. Specifically, the results showed that on average, work stressors are positively related to challenge appraisals ($k = 34, r = .151$), hindrance appraisals ($k = 19, r = .238$), and threat appraisals ($k = 9, r = .247$). However,

studies also found negative associations between work stressors and challenge appraisals (e.g., Gomes, Faria, & Lopes, 2016; Li, Peeters, Taris, & Zhang, 2020) and hindrance appraisals (Kim & Beehr, 2019; Scheuer, Burton, Barber, Finkelstein, & Parker, 2016). For instance, Li, Peeters et al. (2020) found that for nurses time urgency and emotional demands were negatively related to challenge appraisals of these job stressors¹. In addition, Gerich and Weber (2019) found a nonlinear relationship between demand intensity and challenge appraisal such that when demand intensity is low or medium, an increase in demand intensity is related to a significant increase in challenge appraisal, whereas this relationship is attenuated (and not significant) for high demand intensity. Overall, these findings show that prior categorizations of a stressor (e.g., challenge or hindrance) are risky since work stressors can be simultaneously appraised as challenges, hindrances, and/or threats.

In addition, researchers have argued that besides job demands, job resources could also be appraised differently by employees (e.g., Li Peeters et al., 2020). Job resources refer to “physical, psychological, social, or organizational aspects of the job that may be functional in achieving work goals, reduce job demands and its related costs, or stimulate personal growth and development” (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001, p. 501). In our review, several studies investigated appraisals of job resources. For instance, social support and feedback (Li Peeters et al., 2020), task variability (Gerich, 2017), and job control or autonomy (Li Peeters et al., 2020; Ohly & Fritz, 2010) were appraised as challenges and hindrances at the same time. However, overall, the results showed that job resources were positively related to challenge appraisals of job resources, whereas negatively related (e.g.,

¹ **Note:** when there are three or more studies for the correlations between appraisal and other variables, we reported the mean correlations, otherwise we cited the original article to explain how different appraisals related to other variables.

social support, autonomy, and feedback; Li Peeters et al., 2020) or not related (Gerich, 2017) to hindrance appraisals.

The influence of social factors and individual characteristics. Empirical findings show that social factors and individual characteristics were key antecedents of stressor appraisals. First, leadership was found to influence employee appraisals. In two studies, LePine et al. (2016) found that charismatic leadership had a positive effect on challenge appraisals and a negative effect on hindrance appraisals of stressors. Similarly, Liu, Li, Taris, and Peeters (2020) found that servant leadership was positively related to challenge appraisal of creative performance pressure. Leader-Member Exchange was also positively related to challenge appraisals of competitive psychological climate (Spurk, Hofer, & Kauffeld, 2021). Moreover, abusive supervision was negatively related to challenge and positively to hindrance appraisals of abusive supervision (Scheuer et al., 2016). Second, family factors appeared to play a role in employee appraisals of work stressors. Zhu, Burmeister-Lamp, and Hsu (2017) found that family support positively related to challenge appraisals and negatively related to hindrance appraisals. Third, individual differences (refers to various personality characteristics and beliefs, Rudolph, Katz, Lavigne, & Zacher, 2017) influenced how one appraises work stressors. For example, employee self-efficacy (Li, Chen, & Lai, 2018), goal orientation (Ma, Peng et al., 2021), psychological capital (Soykan, Gardner, & Edwards, 2019), sense of coherence (Brady, 2017), deep acting (Huang et al., 2015), conscientiousness (Ma, Liu et al., 2021; Smith et al., 2020), and promotion-focus (Liu et al., 2020) were positively related to challenge appraisals of work stressors, and negatively to hindrance appraisals. Similarly, time management skills (Ma, Kerulis, Wang, & Sachdev, 2020) were negatively related to hindrance appraisals. Overall, these findings indicate that social factors (e.g., leadership and family) and individual differences influence employee's appraisal of work stressors.

Moderators between work stressors and appraisals. The transactional theory states that appraisals are a product of the interplay between a person and his/her environment, indicating that appraisals may be influenced by individual and social processes (Lazarus & Folkman, 1984). Thus, we distinguished between two types of boundary conditions: job resources and individual differences. We found that job resources, like psychological safety climate (Espedido & Searle, 2020), task efficacy (Liu & Li, 2018), charismatic leadership (LePine et al., 2016), social support, and job control (Gerich & Weber, 2019) moderate the relationship between work stressors and appraisals such that when employees have high resources they are more likely to appraise work stressors as highly challenging. Similarly, a favorable participative climate served as a resource in the relationship between work intensification and cognitive appraisal (Paškvan, Kubicek, Prem, Roman, & Korunka, 2016). Further, for employees who perceived their leaders as highly charismatic, stressors were more likely to be appraised as high challenge (LePine et al., 2016).

In addition, individual differences like PsyCap (Chadwick & Raver, 2013), work experience and self-monitoring (Herleman, 2009), trait resilience (Mitchell et al., 2019), time management skills (Ma et al., 2020), consciousness (Ma, Liu et al., 2021), and dispositional resistance (Fugate & Soenen, 2018) have been found to moderate the stressor – appraisal relationships. For instance, Mitchell and colleagues (2019) found that employees high in trait resilience were more likely to report high challenge appraisals of performance pressure (vs. low). Conversely, employees low in trait resilience were more likely to report high threat appraisals of performance pressure than employees high in trait resilience. Similarly, Ma et al. (2020) found that time-management skill buffers the detrimental effect of workflow interruptions on task performance through hindrance appraisal. In sum, these findings lend credit to the idea that employees with high job resources and personal resources are more

likely to appraise certain demands/stressors as high-challenge and low-hindrance or low-threat.

RQ 2: The outcomes of appraisals

In order to investigate how appraisals of different work stressors are related to outcomes (Research question 2), following the previous literature (Hoch, Bommer, Dulebohn, & Wu, 2016; Rudolph et al., 2017; Zhang & Parker, 2019, p.135), we categorized work outcomes into five categorizations: job attitudes, employee well-being, job performance, employee behaviors, and health-related outcomes.

Job attitudes. Challenge appraisals of work stressors (e.g., time pressure, customer demands) were positively related to job satisfaction ($k = 9, r = .25$), work engagement ($k = 8, r = .33$), flourishing (Kim & Beehr, 2019), motivation to work and task persistence (Liu & Li, 2018); and negatively related to turnover intention (Von Hippel, Kalokerinos, Haanterä, & Zacher, 2019). Conversely, hindrance appraisals of work stressors were negatively related to job satisfaction ($k = 4, r = -.35$), work engagement ($k = 7, r = -.25$), flourishing (Kim & Beehr, 2019), motivation to work (Liu & Li, 2018), whereas hindrance appraisal positively related to turnover intention (Lim, 2019; Von Hippel et al., 2019). Similarly, threat appraisals were negatively associated with job satisfaction ($k = 4, r = -.18$), work engagement ($k = 3, r = -.32$), and positively related to turnover intention ($k = 2, r = .32$). Harm/loss appraisal of work stressor (e.g., incivility) was also negatively related to job satisfaction (Marchiondo, Cortina, & Kabat-Farr, 2018) and positively related to turnover intention (Rafferty & Restubog, 2017).

Employee well-being. Challenge appraisals of work stressors were negatively related to emotional exhaustion ($k = 8, r = -.19$), employee burnout ($k = 4, r = -.23$), job stress (Jung, 2015), distress (Gardner & Fletcher, 2009; Ma et al., 2020), anxiety (Ma, Liu et al., 2021) and depression (Gomes et al., 2016); and positively related to positive affect ($k = 3, r = .19$),

eustress ($k = 2, r = .35$), accomplishment (Ben-Zur & Michael, 2007), and life satisfaction (Soykan et al., 2019). Conversely, hindrance appraisal was positively related to emotional exhaustion ($k = 5, r = .27$), burnout ($k = 3, r = .34$), and job stress (Jung, 2015); and negatively related to employee positive affect ($k = 3, r = -.25$). Only one study found a negative effect of hindrance appraisals on job strain (Rath-Cullimore, 2019). Threat appraisal was positively related to emotional exhaustion (Gomes, Faria, & Gonçalves, 2013), distress (Gardner & Fletcher, 2009), psychosomatic distress (González-Morales & Neves, 2015), anxiety/depression (Gomes et al., 2016), and job stress (Jung, 2015); and negatively related to employee life satisfaction (Soykan et al., 2019), eustress (Gardner & Fletcher, 2009), and positive affect (Tuckey et al., 2015). Overall, challenge appraisal is beneficial for employee well-being, whereas hindrance and threat appraisal have a negative influence on employee well-being.

Job performance. Challenge appraisals were positively related to employee contextual performance ($k = 4, r = .23$), and only weakly related to task performance ($k = 5, r = .08$), and creative performance ($k = 2, r = .15$). Li et al. (2017) found that challenge appraisal of reward for creativity was positively related to employee creative performance. Hindrance appraisal was negatively related to employee contextual performance ($k = 3, r = -.14$) and task performance ($k = 3, r = -.14$). As for contextual performance, the results were mixed: whereas Parker et al. (2019) found that hindrance appraisals of performance-based pay were positively related to OCB and negatively related to pro-social behavior, Lim (2019) found an insignificant effect on OCB. In addition, threat appraisal of work stressors were negatively related to OCB ($k = 4, r = -.06$), task performance ($k = 2, r = -.095$), and creative performance ($k = 3, r = -.03$).

Employee behaviors. Challenge appraisals of work stressors were negatively related to employee presenteeism (Charkhabi, 2018) and procrastination behaviors (Prem, Scheel,

Weigelt, Hoffmann, Korunka, 2018); and positively related to compliance with change and championing change when organizational change happens (Fugate & Soenen, 2018), problem prevention (Espedido & Searle, 2020), continuous improvement activities (Chadwick & Raver, 2013), and negatively related to times of sick leave (Carston & Gardner, 2009). Conversely, hindrance appraisals of work stressors were positively related to procrastination behaviors (Prem et al., 2018) and health-related absence (Carston & Gardner, 2009), while negatively related to presenteeism (Charkhabi, 2018). Similarly, threat appraisals were negatively related to continuous improvement activities (Chadwick & Raver, 2013), compliance with change and championing change in case of organizational change (Fugate & Soenen, 2018), whereas positively related to procrastination (Chatellier, 2015), absenteeism (Fugate et al., 2012), and problem prevention behaviors (Espedido & Searle, 2020).

Health-related outcomes. Challenge appraisals were positively related to self-rated health (Gerich, 2017) and physiological health conditions (Lim, 2019). Conversely, hindrance appraisals were negatively associated with self-rated health (Gerich, 2017) and physiological health conditions (Lim, 2019). However, in a cross-sectional study Webster, et al. (2011) found that both challenge and hindrance appraisals were positively related to physical strains.

To summarize, the results show that challenge appraisals of work stressors generally have a positive effect on employee work attitudes, well-being, job performance, behavioral and health-related outcomes. Conversely, hindrance, threat, and harm appraisals have a negative effect on these outcomes. In addition, some researchers started to explore the boundary conditions of the effect of appraisals on employee outcomes (Gartland, O'Connor, Lawton, & Ferguson, 2014). For instance, emotion-focused coping moderated the effects of challenge appraisal on depersonalization, such that the combination of low challenge appraisal and high emotion-focused coping leads to the highest level of depersonalization

(Ben-Zur & Michael, 2007). Similarly, negative affect strengthened the positive relationship between threat and procrastination behavior (Chatellier, 2015).

Mediators between appraisal and outcomes. Besides the direct effect of appraisals on employee outcomes, some researchers explored the mediating mechanisms between appraisals and outcomes. First, the secondary appraisal has been found to mediate the relationship of challenge appraisal and threat appraisal to outcomes (e.g., Gomes et al., 2013). In addition, several studies investigated the mediating role of coping. For instance, Li et al. (2018) found that challenge appraisal of a reward for a creativity program was positively related to problem-focused coping, which in turn predicted high creative performance. By contrast, threat appraisal of a reward for this creativity program was positively associated with emotion-focused coping in the form of blaming, which in turn predicted low creative performance. Moreover, task-focused coping mediated the relationship between challenge appraisal and well-being (i.e., life satisfaction) (Soykan et al., 2019). Similarly, Fugate, Kinicki, and Prussia (2008) found that negative appraisal was associated with increased escape coping, which was positively related to negative emotions. Finally, work attitudes of work engagement (Mitchell et al., 2019), affective commitment (González-Morales & Neves, 2015), organization-based self-esteem, and meaningful work (Kim & Beehr, 2019) were also found to mediate the appraisal – outcomes relationship.

RQ 3: The role of appraisals: moderator or mediator

Our third research question referred to the role of appraisals (i.e., as a moderator or a mediator). In the current literature, we find that appraisals can be both treated as situational perceptions of stressors (as mediators) and individual orientation variables (as moderators) (e.g., Gomes et al., 2016; Li et al., 2017). In particular, when appraisals were treated as an individual response to a stressful situation (building on the transactional stress theory), it

usually serves as a mediator; whereas when appraisals were treated as an individual differences factor, it usually serves as a moderator.

Mediators of appraisal. Among the included 70 studies, most ($k = 47$, 67%) studies treated appraisals as situational variables and used them as mediators (e.g., Ohly & Fritz, 2010; Tuckey et al., 2015), arguing that appraisal is one of the main mechanisms linking work stressors to outcomes (transactional stress theory; Lazarus & Folkman, 1984). Researchers included appraisal as a mediator in different ways. First, a certain stressor can act as a double-edged sword, that is, it produces both a challenge and a hindrance/threat appraisal, which in turn have positive and negative effects on outcomes, respectively (e.g., Sessions et al., 2019; Smith et al., 2020). For instance, Mitchell et al. (2019) found that performance pressure can be both appraised as a challenge and a threat, with threat appraisal leading to incivility and challenge appraisal to increasing work engagement. Second, a priori categorizations of stressors as challenges and hindrances have shown that challenge stressors influence outcomes through challenge appraisal, while hindrance stressors influence outcomes via hindrance appraisal (e.g., Ma, Liu et al., 2021; Ma, Peng et al., 2021). For instance, LePine et al. (2016) found that hindrance stressors influenced task performance via hindrance appraisals. Third, appraisals mediate the associations between factors (other than work stressors) and work outcomes. For instance, challenge appraisal mediated the association between social support and burnout (Ben-Zur & Michael, 2007). Altogether, these results support the notion that work stressors relate to positive outcomes through challenge appraisals (e.g., work engagement, OCB; Marchiondo et al., 2018), whereas they relate to destructive outcomes (e.g., emotional exhaustion, Sessions et al., 2019; incivility, Mitchell et al., 2019) through hindrance and threat appraisals.

Moderators of appraisals. The person-context interaction model (Magnusson & Stattin, 1996) states that individual functioning is the result of the interplay of an individual and his or her environmental factors (Magnusson & Stattin, 1996). In line with this reasoning, appraisals can be regarded as an individual difference factor that can reflect a general appraisal tendency of similar stressors. Six empirical studies included in our review treated appraisals as moderators (9%) (e.g., Gerich & Weber, 2019; Li et al., 2017; Li, Taris et al., 2020; Rath-Cullimore, 2019). For instance, the relationship of perceived reward for creativity with creativity-related intrinsic motivation was especially positive when challenge appraisal was high (Li et al., 2017). Similarly, Li, Taris et al. (2020) demonstrated that when employees perceive job stressors as highly challenging, the detrimental effect of stressors on well-being was weaker than when the stressors were perceived as low challenging. Besides, hindrance appraisals of job insecurity amplified the link between job insecurity and psychological outcomes (e.g., emotional exhaustion) such that the emotional exhaustion was higher when hindrance appraisal was high (Charkhabi, 2018). These studies generally support the beneficial buffering role of high challenge appraisals and the detrimental effect of high hindrance appraisals.

RQ 4: The Measurement of appraisals

Our final question concerned the best way of measuring appraisals. Forty-two of the studies included here measured appraisals of specific stressors (e.g., appraisal of job insecurity, problem-solving demands). The other studies included appraisal measures of holistic stressors (e.g., appraisal of “the demands of my job”, LePine et al., 2016; “work tasks”, Ohly & Fritz, 2010; or the job “as a whole”, Gomes et al., 2016). With regard to the scales used, to our best knowledge there exist currently at least 18 different measures of appraisals. More than 10 scales have developed in the past decade (e.g., González-Morales & Neves, 2015; Jung, 2015; Kaltiainen et al., 2020; LePine et al., 2016). We evaluate each of these on their frequency of

use and their validity. The most often used scale is the eight-item Challenge-hindrance appraisal scale developed by Searle and Auton (2015), which measures employees' appraisal in reaction to a certain stressful event. This scale was later adapted by Li, Taris et al. (2020) by creating different stressor vignettes, and then asking how one appraises the situation, which can reflect individuals' general appraisal tendency of a work stressor. The second often-used instrument is the 18-item Cognitive Appraisal Scale (CAS) developed by Skinner and Brewer (2002), which taps challenges (e.g., "I tend to focus on the positive aspects of any situation") and threats ("I feel that difficulties are piling up so that I cannot overcome them"). Another often-used instrument was developed by LePine et al. (2016), which is based on the definition of challenge-hindrance appraisals. Besides, there are studies that used single-item measurement of appraisals (Gerich, 2017; Gerich & Weber, 2019; e.g., "I felt challenged" or "I felt hindrance", measures ranged from 1 "strongly disagree," to 7 "strongly agree", Webster et al., 2011). For instance, in their study, Gerich and Weber (2019) first presented employees a work-related demand (e.g., demand intensity) and the challenge appraisal for work stressor was assessed by a statement "I feel that this condition e.g., work intensity, is a beneficial opportunity/challenge for me"; Hindrance appraisal was covered by a statement "I feel that this condition is a burden for me" answers were measured on a Likert format (e.g., "I do not agree at all" to "I fully agree"). Finally, researchers also used bipolar measures of challenge-hindrance appraisals (e.g., Paškvan et al., 2016). The bipolar measurement asked employees to "How do you appraise this change?" on a scale ranging from 1 = hindrance to 5 = challenge.

Discussion

The main aims of this study were to integrate research on work stressor appraisals (e.g., challenge, hindrance, and threats) by quantitatively and qualitatively synthesizing empirical

findings on relevant antecedents and outcomes of appraisals, the roles of appraisals, and the measurement of appraisals. We found that: (1) work stressors can be appraised as challenges, hindrances, and threats; (2) job resources and individual differences shape employees' perception of work stressors such that with more job or personal resources, employees are more likely to appraise work stressors as a challenge; (3) challenge appraisals are positively related to employee work attitudes, job performance, well-being, and physical health, whereas hindrance and threat appraisals are negatively related to these outcomes; (4) appraisals are major mechanisms linking work stressors and employee outcomes (i.e. mediating role), but appraisals can also moderate the relationship between work stressors and employee outcomes; (5) there exist currently 18 different measures of appraisals and the most popular used scales were: Searle and Auton (2015); LePine et al. (2016); Skinner and Brewer (2002).

Table 1. *Comparison of Four Recommended Measures of Work Stressor Appraisals*

Authors	Name of measure	No. of items	Key dimensions	Frequency
Searle & Auton, 2015	challenge-hindrance	8	challenge, hindrance	17
Skinner & Brewer, 2002	CAS	16	challenge, hindrance	4
Feldman et al. 2004	threat appraisal	3	threat	4
Peacock & Wong, 1990	SAM	7	challenge, threat	4

Implications for future research

Our review was constrained by the availability of primary studies, as most of the primary studies included in our review did not utilize research designs that can infer causality. With the limitations in mind, our review of stress appraisal reveals important conceptual and

methodological gaps that provide important opportunities for future research. In particular, we list 7 topics in Table 2 that bear further consideration and elaboration as part of future research efforts. We explain these directions in detail below.

Topic 1: Typology of stress appraisal. By reviewing previous studies, we propose that it's necessary to clarify the conceptualization of stress appraisals. In the existing literature, researchers have used the terms hindrance appraisal and threat appraisals interchangeably, because both of them are based on a negative appraisal of stressors (e.g., Folkman, 1984; LePine et al., 2016). For instance, Charkhabi (2018) defined “hindrance appraisals are mainly associated with the appraisal of threats as ‘losses or harms’ ...”. This is inconsistent with the definition of hindrance stressors, which is defined as working conditions “that tend to constrain or interfere with an individual’s work achievement” (Cavanaugh et al., 2000, p. 68). Although some researchers suggested that these two could be clarified conceptually (e.g., Smith et al., 2020; Tuckey et al., 2015), this review shows similar negative effects on employee outcomes. To investigate the incremental validity, future meta-analysis can test whether threat appraisals can explain employee outcomes beyond hindrance appraisals (e.g., Judge & Piccolo, 2004). Alternatively, these two appraisals may represent a high-level concept of negative appraisals. Therefore, we propose a potential new typology of cognitive appraisals: positive appraisals and negative appraisals. *Positive appraisals*, mainly focus on the bright sides of work stressors (e.g., opportunity, learning, growth, and achievement), including challenge appraisals and beneficial appraisal (i.e., believing work stressor is good for one’s well-being, health, performance, etc.). *Negative appraisals* focus on the dark sides of stressful situations, for instance, potential loss or harm for one’s health or well-being, or thwarting one to achieve work related goals. Examples are hindrance, threat, loss or harm appraisals. We argue this may be an essential yet neglected distinction in the appraisal literature. Using this typology to study stressor appraisals requires researchers to

explicitly choosing and stating both references of work stressors and appraisals, and this may lead to a new understanding of current constructs and theoretical developments between work stressor and appraisals research. Future researchers are encouraged to explore this possibility and establish a validated measurement of the positive-negative appraisal scale.

Topic 2: Antecedents of appraisals. Within the past 16 years, there has been a major interest in the role that work characteristics (Li, Taris et al., 2020), individual differences, and leadership play in stressor appraisals (LePine et al., 2016). While these studies have advanced our knowledge of the antecedents of appraisals, the role of social factors in shaping workers' appraisals was not well-acknowledged. In particular, existing studies are limited by omitting attention to the influence of social context (in particular organizational outsiders, e.g., customers, clients, and patients). Social context plays a crucial role in influencing employees' behavior (Grant & Parker, 2009), as the interactive working environment includes opportunities that are vital to foster individual growth and career success (Wang, Li, & Chen, 2020). Social factors include connections that employees were involved in work domains (e.g., leaders, coworkers, customers, clients, and patients) and non-work domains (e.g., families and friends) (Wang et al., 2020). For instance, customer mistreatment or incivility (Wang et al., 2013) and patients mistreatment (Karaeminogullari, Erdogan, & Bauer, 2018) have been revealed as important work stressors, how these factors influence employees' appraisal can be investigated. In addition, how organizational insiders' (e.g., colleagues and supervisors) appraisal influence employees' appraisal was unclear. To our best knowledge, although studies investigated how work interruptions from supervisors and colleagues influenced employees' hindrance appraisal (Ma et al., 2020), no study has investigated how leaders' and colleagues' appraisals of work stressors influence employee's appraisal of work stressors. Based on social learning theory (Bandura, 1977), it is possible that leaders' and

colleagues' attitudes to work stressors will influence how employees appraise it, as leaders, colleagues, and family members might serve as role models for addressing work stressors.

Topic 3: Comparing different mechanisms linking stressor – outcomes. In our reviewed articles, building on cognitive theories, appraisals were treated as major mechanisms linking work stressors and outcomes (e.g., LePine et al., 2016; Sessions et al., 2019). However, there are still several gaps in the current literature. First, very few studies have compared them with other cognitive mechanisms. Multiple pathway studies are expected, for instance, how affect, work rumination, and positive appraisals and negative appraisals mediate the stressor – outcomes relationships, and which has a stronger power for predicting outcomes. Moreover, the existed literature pays less attention to the difference between cognitive appraisal strategy, affect, and behavioral regulatory strategy (e.g., the self-regulation process, Zhang, Zhang, Ng, & Lam, 2019), which are both important mechanisms linking stressors and work outcomes. For example, as a kind of behavioral regulatory strategy, job crafting has been found to be an effective strategy to transfer important social resources into increased work outcomes (for a meta-analysis, see Wang et al., 2020). Similarly, researchers suggested that affect and cognition are closely intertwined (Damasio, 2001), and affect has been shown to mediate the stressor – outcomes relationship (e.g., Simon, Hurst, Kelley, & Judge, 2015). Future studies could investigate which is a better strategy to address work stressors and what is the relationship between them (i.e., behavioral, affective, or cognitive appraisals).

Topic 4: Multilevel investigation of stress appraisals. Most of the studies in the present review have tended to focus on the individual level of analysis when studying stress appraisal. We believe that investigating appraisal at different levels will be a fruitful direction that might strengthen our understanding of stress appraisal. Firstly, it is interesting to

incorporate the within-person variation of stress appraisal into consideration. Actually, some researchers start to measure employees' daily appraisals of work stressors (among others, see Prem et al., 2018, for appraisals of daily work situations; Tuckey et al., 2015; Von Hippel et al., 2019, for appraisals of the daily event). These studies showed that employees' appraisal varies across days, however, very few studies have considered how appraisal's variability (i.e. a person's level of variability in the daily appraisal of work stressors) influences the stressor and outcomes. The influence of daily appraisals and appraisal variability on employee outcomes may differ. For instance, researchers have found that although daily flow is positively related to creative performance, flow variability is negatively related to daily creative performance (Stollberger & Debus, 2020). Similarly, Sun, Wayne, and Liu (2021) showed that although a leader's positive affect is beneficial to employee engagement, the variability of leader affect weakens the positive relationship between observed leader positive affect and work engagement through employee positive affect. Future studies can test how the appraisal variability influences employees' outcomes.

In addition, existed literature usually focused on stress appraisal caused by an individual's own tasks. However, team context has a unique impact on team processes and outcomes (Barrick, Stewart, Neubert, & Mount, 1998), it is surprising that we know little about how team stress appraisal affects team and employee behaviors. A team concept of stress appraisal could provide a more reliable estimation of the team context and can help us build a multilevel theory on stress appraisal. For example, Espedido, Searle, and Griffin (2019) using data from 43 work teams revealed that stress appraisals are influenced by the group, not just by individual factors. Future research can both justify the notions related to team stress appraisals and systematically test their effects in organizations.

Topic 5: Moderating roles of appraisals. Despite the majority of studies treated appraisals as mediators linking work stressors and outcome, Li, Taris et al. (2020) argued that

when appraisals were treated as an individual difference factor, appraisals can also serve as moderators. Similar ideas are embraced by other researchers (e.g., O'Brien & Beehr, 2019). The categorization of appraisals as individual differences factors suggests appraisals are like personality traits (O'Brien & Beehr, 2019), which to some extent are stable. This is in line with the conceptualization of Skinner and Brewer (2002), who defined appraisals as cognitive appraisal styles (i.e., "dispositions to appraise ongoing relationships with the environment consistently in one way or another", Lazarus, 1991, p. 138). However, empirical studies investigating the moderating role of appraisals are still limited. So, we call for future researchers to investigate more about the moderating role of appraisals, which can help us clarify how appraisals link work stressors to outcomes. It should be mentioned that when researchers conceptualized appraisal as an individual difference, the measurement should use the appraisal style scale, whereas when appraisals were conceptualized as a response to certain work stressors, measurement of appraisals must be specified (i.e., what stressors do we measure when we measure appraisals).

Topic 6: Appraisals and coping. Although the transactional theory of stress suggested that appraisals influence how one copes with the stressful situation (i.e., emotional-focused coping or problem-focused coping; Lazarus & Folkman, 1984), only a few studies have included coping in their research (e.g., Fugate et al., 2012). Obviously, the relationship between appraisals and coping has been understudied. Thus, an important direction for future studies is to investigate how appraisals influence adaptive and maladaptive copings and ultimately influence employee behavioral and attitudinal outcomes (e.g., performance). In particular, building on regulatory focus theory Zhang and colleagues (2019) proposed a new taxonomy of promotion-and prevention-focused coping, they suggested that challenge stressors will trigger promotion-focused coping whereas hindrance stressors will evoke prevention-focused coping. In a meta-analysis, they showed that these two copings serve as

important mechanisms that linking the relationships between work stressors and individual outcomes. A limitation of this taxonomy is that the role of appraisals was ignored. Thus, we suggest future studies to include coping and to investigate work stressors, appraisals, coping, and outcomes in a systematic way.

Topic 7: Methodology issues for future research. Considering that the majority of studies in our reviewed articles used observation data (more than half used cross-sectional designs), it is hard to make causal inferences and protect against endogeneity bias (Antonakis, Bendahan, Jacquart, & Lalive, 2010). Thus, an important direction for future studies investigating appraisals of work stressors is to assess causality. This is because the majority of our reviewed articles assumed that temporal primacy of appraisals related to employee outcomes, which however does not permit investigation of reverse or reciprocal influences. An alternative explanation is that employees with poor performance may more likely to see their job demands as a hindrance or a threat. For appraisal studies, Tuckey et al. (2015) revealed the potential for gain spiral effects such that dedication enables workers to produce more resources, which in turn results in lower perceived job hindrances. Thus, future studies on the one side should endorse more experimental designs to test causality. For instance, by creating a similar stressful working environment and manipulate different appraisals (i.e., challenge vs. hindrance), and comparing how it will influence employee outcomes. On the other side, longitudinal research should be conducted to clarify the causal ordering of appraisals and the outcomes. In addition, so far empirical studies have been exclusively using a variable-centered approach, a person-centered approach has been ignored. Thus, future studies can take this initiative to test whether there are subpopulations that appraise job stressors in a similar way, and how it will influence their outcomes.

Table 2. *Directions for Future Research: Topics and Major Issues*

Research direction	Major Issues
Topic 1: Typology of stress appraisal	<ul style="list-style-type: none"> ● What new typology of appraisals can researchers use to effectively distinct different appraisals? ● How can measure this new typology of appraisals adequately?
Topic 2: Antecedents of stress appraisal	<ul style="list-style-type: none"> ● How do social factors (e.g., customer mistreatment or incivility) drive different stress appraisals at work? ● How do colleagues' and supervisors' appraisals of stress influence an individual's own stress appraisals?
Topic 3: Different mechanisms linking stressor-outcomes	<ul style="list-style-type: none"> ● How do other cognitive mechanisms work between stressors and work outcomes? Which cognitive mechanisms (e.g., stress appraisals, self-efficacy, work rumination, etc.) has stronger power for predicting outcomes? ● What are the differences between cognitive appraisal strategy and behavioral regulatory strategy? Which one is a better strategy?
Topic 4: Multilevel investigation of stress appraisals	<ul style="list-style-type: none"> ● How do within-person variation of stress appraisal influence employees? ● How can stress appraisal at the team level impact team process and outcomes?
Topic 5: Moderator role of stress appraisal	<ul style="list-style-type: none"> ● How do appraisal tendencies interact with work stress predict employee outcomes?
Topic 6: Appraisal and coping	<ul style="list-style-type: none"> ● How do appraisals influence adaptive and maladaptive copings and ultimately influence employee behavioral and attitudinal outcomes?
Topic 7: Methodology issues	<ul style="list-style-type: none"> ● How to test the causality between stressor and appraisals? ● A person-centered approach to investigate appraisals of work stressors.

Going forward, for both future research and practice, we recommend several measures of work stressor appraisals that have been validated by different samples. First, Searle and Auton (2015), this scale has been validated in different work populations (e.g., Australia and China), and the average internal reliability of challenge appraisal is .91 ($k = 10$), and hindrance appraisal is .92 ($k = 8$). It should be mentioned that this scale must be framed in relation to a specific event or a situation, when one wants to measure employees' general tendency of work stressors, the revised version can be used (see Li, Taris et al., 2020). In addition, for researchers who want to measure trait appraisals, the CAS scale developed by Skinner and Brewer (2002) was recommended.

Practical Implications

The stressor appraisal literature has produced research findings that can be used for employees and organizations. The first conclusion that can be derived from the study of stress appraisals is that stressors can be appraised in different ways (i.e., as challenges, hindrances, and threats), and challenge appraisals are associated with a broad range of functional outcomes, whereas negative appraisals (hindrance and threat) are predictors of negative outcomes. Thus, for individuals, when faced with work stressors, focusing on the positive sides instead of the potential threats/thwarts of stressful situations could yield more positive outcomes in the form of job performance, attitude, and well-being. How can organizations and individuals promote challenge appraisals? For organizations and managers, when promoting requirements or demands on employees, it is important to emphasize the potential opportunity and benefits for employees (e.g., learn, grow, and reward), and mitigate individuals' perceptions of hindrance/threat (Fugate, Kinicki, & Prussia, 2008). Also, organizations could consider training employees on how to use challenge appraisal as a stressor regulation strategy. In this case, work stressors can have functional outcomes on employee outcomes. The second conclusion based on our review is that job resources and

individual resources promote challenge appraisals. Thus, for organizations, it is important to create an environment that makes challenge appraisals possible, and providing important social resources for employees when they are faced with highly stressful situations. Positive leadership styles (e.g., charismatic, LePine et al., 2016) have been found to promote challenge appraisals, and certain individual factors (e.g., promotion focus) also serve as a buffer. For employees, having enough resources seems a key predictor to address work stress, thus employees can change a certain aspect of their job (e.g., seeking social resources and seeking structural resources; Tims, Bakker, & Derks, 2013) to have challenge appraisals. Finally, although few studies investigated the role of coping, our review shows that it is important to see not only how one perceives the stressors, but also to know how one copes with them. Challenge appraisals are generally positively related to problem/task-focused coping, which in turn predicts increased performance (e.g., Li et al., 2018) and well-being (Soykan et al., 2019). By contrast, negative appraisals (threat and hindrance) are positively associated with emotion-focused coping or escape coping, which in turn predicts low performance (Soykan et al., 2019) and increased negative emotions (Fugate et al., 2008). This supports a cognitive appraisal approach to the coping process, and further shows the benefits to have positive appraisals.

Conclusion

In this study, to provide a new perspective of the current debate about whether the challenge-hindrance framework is valid or not, we systematically reviewed articles of work stressor appraisal research. We reviewed relationships between appraisal, job characteristics, and employee outcomes, by considering the role of appraisal as a mediator or a moderator. Results show that it is important to focus on the positive sides instead of on the potential threats/thwarts of stressful situations for this could yield more positive outcomes in the form

of job performance, attitude, well-being, and problem/task-focused coping. Given the important role of appraisals, future stressors researchers will need to consider appraisal more in depth instead of using a priori-categorization approach.

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Chapter 3

Challenge and Hindrance Appraisals of Job Demands: One Man's Meat, Another Man's Poison?

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Abstract

Many job stress models assume that all workers experience a particular job demand in the same way – an assumption that may or may not be warranted and that has rarely been tested. Building on appraisal theory, we explore (a) how individuals appraise particular job demands (i.e., as a challenge or as a hindrance) and (b) how these appraisals affect the relationship between job demands and engagement/burnout. A multi-occupation cross-sectional study was conducted among 527 Chinese workers (321 females, 60.9%; $M_{\text{age}} = 32.74$, $SD = 6.70$). The data were analyzed using hierarchical multiple regression analysis. We found that the appraisal of job demands (time urgency, role conflict, and emotional demands) as a challenge moderated the associations between these demands and burnout/engagement. Generally, the results indicate that the presence of high job demands was associated with negative outcomes. However, these detrimental effects were weaker if workers appraised these characteristics as being high-challenge. This study extends research on job demands within the challenge–hindrance framework by focusing on the moderating effects of appraisals. Given the important role of appraisal, we conclude that researchers should include appraisal more systematically in their theorizing and research on the effects of job demands on well-being.

Keywords: Job demands, challenge appraisals, hindrance appraisals, engagement, burnout

Introduction

Recent years have witnessed a growing conviction among researchers that job demands (defined as the "physical, social, or organizational aspects of the job that require sustained physical or mental effort", cf. Demerouti, Bakker, Nachreiner, & Schaufeli, 2001, p. 501) are not all created equal (e.g., LePine, Podsakoff, & LePine, 2005). Yet, just how the differences between specific job demands influence workers' behavior and well-being is still unclear. Most of the early research on this issue used a priori categorization of a demand as either a challenge or a hindrance (e.g., Podsakoff, LePine, & LePine, 2007), which might be overly simplistic. Extending the challenge-hindrance framework, empirical studies have shown that job demands can be appraised as being both challenging and hindering at the same time (Webster, Beehr, & Love, 2011); even after accounting for the effects of demands, individual differences in the appraisal of these demands consistently explained unique variance in work outcomes (Searle & Auton, 2015). Appraisal refers to the subjective interpretation that particular job demands have the potential for personal gain, growth, or constraints (LePine, Zhang, Crawford, & Rich, 2016). However, despite the potential benefits of including appraisal in studying the effects of job demands on outcomes, scholars have not yet systematically included appraisal in their theoretical frameworks.

To date, researchers have largely considered appraisal as a mediator (e.g., Ohly & Fritz, 2010), arguing that appraisal is one of the main mechanisms linking job demands to outcomes (cf. Lazarus & Folkman's (1984) transactional stress theory). However, on the basis of the person–context interaction theory (Magnusson & Stattin, 1996), we propose that appraisal can also serve as a moderator of these relationships. This theory states that individual functioning is the result of the interplay of individual and environmental factors. Individuals may perceive (or *appraise*) job demands differently (that is, more as a hindrance, more as a challenge, or both), and it seems possible that such differences affect the nature and

magnitude of the relations between job demands and work outcomes (e.g., well-being). Unfortunately, at present little research has addressed the possible moderation effect of appraisals in job demands research.

The current study aims to analyze the moderating role of the appraisal of job demands in the relationship with employee well-being. Accordingly, this study advances and refines our knowledge concerning the role of appraisals in the associations between demands and well-being, offering an alternative account of the inconsistencies in the literature regarding the possible differential effects of job demands on outcomes.

The Challenge-Hindrance demands framework

A large body of research has shown that high levels of job demands tend to be associated with (or even causally lead to) adverse outcomes, such as high levels of stress, strain and sickness absence (Lesener, Gusy, & Wolter, 2018; Schaufeli & Taris, 2014, for reviews). From a practical point of view, it is often assumed that poorly designed jobs or chronically high job demands exhaust employees' mental and physical resources and may therefore lead to health problems (Demerouti et al., 2001). However, some studies reported unexpected positive, rather than negative, relationships between job demands and outcomes such as work engagement (e.g., Bakker, Demerouti, & Schaufeli, 2005; Van den Broeck, De Cuyper, De Witte, & Vansteenkiste, 2010).

To account for these and other inconsistent results, scholars have argued that not all demands are created equal (LePine et al., 2005; Van den Broeck et al., 2010). Importantly, LePine et al. (2005) distinguished between two different kinds of job demands: hindrance versus challenge job demands. *Hindrance demands* are defined as demands or work circumstances that involve excessive or undesirable constraints that interfere with or inhibit an individual's ability to achieve valued goals (Cavanaugh, Boswell, Roehling, & Boudreau,

2000). Examples are role conflict, role overload, and role ambiguity (LePine et al., 2005; Webster et al., 2011). Conversely, *challenge demands* refer to demands that cost effort but also present potential for personal growth and rewards (Podsakoff et al., 2007). Job demands that have been identified as challenges include workload, time pressure, and responsibility (LePine et al., 2005). Consistent with this reasoning, meta-analytical reviews have demonstrated that challenge demands are indeed positively associated with outcomes such as engagement (Podsakoff et al., 2007; Lesener et al., 2018) and that hindrance demands are negatively related to engagement (Crawford, LePine, & Rich, 2010).

Although the challenge-hindrance demands framework has advanced our understanding of the differential effects of demands on employee well-being, two criticisms have been made. First, the categorization of job demands into challenges versus hindrances has not always been consistent (Bakker & Sanz-Vergel, 2013). For example, some studies consider emotional demands as challenge demands (Bakker & Sanz-Vergel, 2013), while others consider these demands as hindrances (Albrecht, 2015; Van den Broeck, et al., 2010). Similarly, role conflict has sometimes been classified as a challenge (Wincent & Örtqvist, 2011) but also as a hindrance (Crawford et al., 2010). Apparently, job demands are not always consistently categorized as either hindrances or challenges.

Second, although most research has used a-priori categorizations of the two types of demands (Searle & Auton, 2015), researchers have argued that classifying demands as either a challenge or a hindrance may be overly simplistic because any a-priori taxonomy of demands ignores the role of subjective individual appraisals (González-Morales & Neves, 2015; Parker, 2014). Individual appraisals determine the extent to which job demands are experienced as more or less hindering or challenging (Lazarus & Folkman, 1984; Van den Broeck et al., 2010). Indeed, Webster et al. (2011) has demonstrated that workers can appraise demands as *both* challenging and hindering. Thus, appraisal-based approaches can assess to

what extent and why someone perceives a particular demand as a challenge and/or a hindrance (Parker, 2014), and also how this appraisal relates to possible outcomes.

In sum, both theory and empirical evidence underline the necessity to include appraisals in research on the effects of job demands on worker's outcomes. Therefore, the present study examines (a) how employees appraise three different job demands (time urgency, role conflict and emotional demands, respectively), and (b) whether and how the appraisal of these demands impacts the demands – well-being relationship. These three demands were selected because meta-analytic reviews have shown that they are well-established and important correlates (or even causal antecedents) of employee well-being (Alarcon, 2011; Crawford, et al., 2010). Further, time urgency (Van den Broeck et al., 2010) has in previous research been assumed to be a challenge demand (for a review, see Crawford, et al., 2010), whereas for emotional demands and role conflict the a-priori categorization as either a challenge or a hindrance has so far not been consistent (Albrecht, 2015; Crawford et al., 2010; Wincent & Örtqvist, 2011). Examining both ambiguous and conceptually clear demands allows us to test the robustness of a-priori categorizations of demands as either challenging or hindering and contributes to the understanding of the possible moderating role of the appraisal of both types of demands.

The moderation effects of appraisals on employee well-being

According to transactional stress theory (Lazarus & Folkman, 1984), the response to stressful events depends on how one appraises the situation. When confronted with an event, a person will evaluate how stressful the situation is (primary appraisal). Secondary appraisal occurs almost at the same time, and the basic question here is 'Can I cope?' Here an individual assesses the extent to which his/her available resources are (in)sufficient to deal with the situation. Depending on the primary evaluation, the situation is perceived as more or less

challenging or hindering; and drawing on the secondary evaluation, the outcome is perceived as either controllable or not (Lazarus & Folkman, 1984).

In the work context, researchers posit that two appraisals determine how individuals respond to different work demands: challenge appraisals and hindrance appraisals (LePine et al., 2005; LePine et al., 2016). Challenge appraisals are defined as an individual's subjective interpretation that particular demands have the potential for personal gain, growth, development, and well-being (LePine et al., 2016). Hindrance appraisals refer to an individual's subjective interpretation that these demands or work circumstances have the potential to interfere with or obstruct/thwart an individual to achieve valued goals (Cavanaugh et al., 2000; Searle & Auton, 2015). Note that *demands* are conceptually distinguished from their *appraisal*. While demands refer to the presence of particular physical, social, or organizational job requirements (cf. Demerouti et al., 2001), appraisals refer to an individual's subjective *interpretation* of these demands as having the potential for personal gain, growth, or constraints (LePine et al., 2016). Thus, a challenge job demand is a demand that is appraised as being challenging, while a hindrance demand is a demand that is appraised as being hindering.

To date, research in the area of work and stress has provided some evidence for a mediating role of appraisal in the relationship between job demands and work outcomes. For instance, Webster et al. (2011) found that the primary appraisal of particular job demands (role ambiguity, workload, and responsibility) partially mediated the relationship between these demands and work outcomes (i.e., emotional exhaustion, job dissatisfaction, and turnover intentions). Likewise, Searle and Auton (2015) demonstrated that job demands have indirect effects on outcomes via appraisals. Similar results were reported in other studies (among others, LePine et al., 2016; Liu & Li, 2018; Ohly & Fritz, 2010). Building on and extending these findings, we argue that appraisals can also serve as *moderators* of particular

relationships. Specifically, individual differences in cognitive appraisals are likely to affect how employees perceive their job demands and, thus, what the effects of these demands will be. This argument is in line with the person–context interaction theory that individual behavior is the result of the interplay of individual differences and environmental factors (Magnusson & Stattin, 1996). If so, it seems plausible that appraisals will moderate the associations between particular job demands and outcomes.

Study hypotheses

Previous research has convincingly demonstrated direct relationships between high job demands and elevated levels of burnout (e.g., Bakker & Demerouti, 2017; Lesener et al., 2018; Schaufeli & Taris, 2014) and lower levels of engagement (Crawford et al., 2010; van den Broeck et al., 2010). Thus, we hypothesize that job demands will be negatively related to engagement (*Hypothesis 1*) and positively to burnout (*Hypothesis 2*).

As aforementioned, appraisals will moderate the demands–well-being relationship, that is, the strength of these relationships will vary as a function of appraisal. Specifically, for workers who generally appraise a particular job demand as something that can be overcome and that may lead to growth and rewards (i.e., as a challenge, Podsakoff et al., 2007), the magnitude of the presumed adverse effects of this demand on burnout and engagement will be relatively small. Earlier studies examining moderators of the stressor – performance/emotional exhaustion relationship provide insight into the moderation role of appraisals on the demands – well-being relationship. For example, Hewett, Liefoghe, Visockaite, and Roongrerngsuke (2018) have shown that individuals who are subject to work-related bullying but who do not see themselves as being bullied, report higher levels of performance than others. Similarly, Koopmann et al. (2018) found that cognitive appraisal can mitigate the negative effect of prevention focus on emotional exhaustion. The reverse

applies when workers appraise a particular demand as a hindrance (LePine et al., 2016): the potential for obstruction of goal attainment and thwarted growth will lead them to adopt an avoidance-oriented approach and increase stress (Lazarus & Folkman, 1984), and this would seem likely to amplify the hypothesized adverse effects of this demand on outcomes.

Basically, we argue that appraisal may determine how employees react to a demand, and that this will affect the magnitude (and perhaps even the direction) of its associations with the study outcomes. Similarly, Li, Deng, Leung, and Zhao (2017) showed that appraisals of reward moderate the associations between perceived reward for creativity and creativity-related intrinsic motivation: the relationship of perceived reward for creativity with creativity-related intrinsic motivation was especially positive when challenge appraisal was high (Hewett et al., 2018; Koopmann et al., 2018, for similar findings). In sum, the moderating role focuses on individual differences in the appraisals affecting the extent to which job demands are related to well-being.

Our theoretical analysis as well as previous research suggests that challenge and hindrance appraisals will moderate the effect of job demands on well-being in opposite directions. Therefore, we hypothesize that challenge appraisals moderate the relationships between job demands and well-being, such that when challenge appraisal is high, the relationship between demands and engagement is less negative (*Hypothesis 3*) and the relation between demands and burnout is less positive (*Hypothesis 4*) than when challenge appraisal is low. Similarly, hindrance appraisal will moderate the relationship between job demands and well-being, such that when hindrance appraisal is high, the relationship between demands and engagement is more negative (*Hypothesis 5*) and the relation between demands and burnout is more positive (*Hypothesis 6*) than when hindrance appraisal is low.

Method

Procedure

Data were collected by an external online survey company. The company's platform allows researchers to selectively sample participants with certain pre-specified characteristics (e.g., full-time employees in this study). To ensure the adequate size of the sample, an a-priori G*Power analysis showed that to obtain 95% chance of finding a moderate effect size of 0.5, we needed to have at least 103 participants. However, Marsh, Hau, Balla, and Grayson (1998) argued that "more is never too much" for the number of participants' in SEM/CFA, as generalizability is typically enhanced with larger samples of participants. Thus, we decided to collect data from at least 500 participants. This research was conducted in compliance with the principles of the Declaration of Helsinki. The cover letter explained the general purpose of the study and assured the voluntary participation and confidentiality of the responses. All participants read and clicked informed consent before submitting their data. Participants received the equivalent of €1.40 if they completed the questionnaire.

Participants

We sent the questionnaires to 1,720 Chinese employees, and received 535 completed questionnaires in return (overall response rate of 31.1%) in a week. Based on their response pattern, the data of eight participants were excluded from further analysis (seven of them used more than 4 hours to finish their survey, and one used long strings of the same character in his/her responses i.e., a sequence of 17 '5's; Curran, 2016). Thus, in total, data from 527 participants were used. Respondents were on average 32.74 years old ($SD = 6.70$), and had worked in their organization for 7.17 years ($SD = 5.85$); 60.9% were female; Most participants held a bachelor ($n = 408, 77.4%$) or master degree ($n = 50, 9.5%$). Employees worked in different industries, including E-commerce ($n = 91, 17.3%$), real

estate/construction ($n = 63$, 12.0%), aerospace/energy ($n = 46$, 8.7%), transportation ($n = 41$, 7.8%), education/training ($n = 40$, 7.6%), communications/telecom operation ($n = 40$, 7.6%), entertainment/travel ($n = 32$, 6.1%), clothing/textile/leather ($n = 28$, 5.3%), medicine, financial, advertising, agriculture (in total $n = 65$, 12.3%), and others ($n = 81$, 15.4%).

Measurements

Since the survey was conducted in China, if possible existing Chinese translations of the study concepts were used. In most other cases, existing instruments were translated into Chinese by professional, bilingual translators using standard procedures (Brislin, Lonner, & Thorndike, 1973). Unless stated otherwise, items were scored on 7-point Likert scales ranging from 1 = “strongly disagree” to 7 = “strongly agree”. The reliabilities of the study variables (Cronbach's alpha) are presented in Table 2.

Time urgency. Time urgency was assessed with four items. Three of these were adapted from Maruping, Venkatesh, Thatcher, and Patel (2015), including “I am often under a lot of pressure to complete my tasks on time”. In an attempt to increase the reliability of this instrument a fourth item was taken from Rodell and Judge (2009), namely “I often experience time pressures in my work”.

Role conflict. We measured role conflict with three items from the Cross-Cultural Role Conflict, Ambiguity, and Overload Scale (Peterson, Smith, Akande, Ayestaran, et al., 1995). A typical item is “In my job I receive incompatible requests from two or more people”.

Emotional demands. This concept was assessed with four items from the Emotional job demands scale (Peeters, Montgomery, Bakker, & Schaufeli, 2005). An example is “Is your work emotionally demanding?” (1 = “never”, 5 = “often”).

Appraisals. We operationalized cognitive appraisal as how one judges, in general, a

specific demanding situation by asking to what extent the employee appraises a specific hypothetical situation that refers to the job demand at stake as challenging/hindering. To measure the challenge and hindrance appraisals we partly based our instrument on Searle and Auton's (2015) Challenge and Hindrance Appraisals scale. For each of the three demands included in our study, participants indicated to what degree they considered this specific demand a challenge or a hindrance. For each demand, challenge appraisal and hindrance appraisal were assessed with four items each. We developed the framing of the introduction of the challenge/hindrance scales to correspond with the items tapping the specific demand to be appraised with these scales. This approach was used because (a) it is important that the measurement of demands and appraisals refers to the same level (either very specific at the daily level, e.g., Ohly & Fritz, 2010; or more general). In this study, we aim to investigate how employees' appraisal of a specific demand *in general* (so not on a particular day, more about *a general belief*) will influence the demands–well-being relationship; and (b) the sample in the present study consists of employees from diverse organizations, and we did not have any information about the most relevant job demands. As a result, it is difficult to refer to current job demands and ask about the appraisal of these demands, because some employees might not face these specific job demands, or only to a very low extent. Referring to a hypothetical situation seems a good solution in such a situation. To this aim we have measured both demands and appraisal at a similar general level. Taking time urgency as an example, to measure time urgency we asked the following question: 'I am often under a lot of pressure to complete my tasks on time'. The hypothetical framing read "Imagine the following situation: Chris says 'in my job, I am under a lot of pressure to complete my tasks on time. I have not much time to complete my tasks, and the amount of time provided to complete my tasks is short.'" The main question then was "In general, I believe that having a job like Chris's ...", which was followed by the two four-item sets tapping challenge

appraisal (e.g., "...will help me to learn a lot") and hindrance appraisal (e.g., "... will hinder any achievements I might have"). Similar vignettes were developed for the two other job demands (i.e., role conflict and emotional demands). The complete scales are available upon request from the corresponding author.

Burnout. We assessed burnout with nine items measuring two dimensions (exhaustion and cynicism) of the Chinese version (Hu & Schaufeli, 2011) of the Maslach Burnout Inventory General Survey (MBI-GS; Maslach, Jackson, Leiter, Schaufeli, & Schwab, 1986). These two subscales tap the core dimensions of burnout (Schaufeli & Taris, 2005). Items included "I feel used up at the end of a work day" (Emotional exhaustion) and "I doubt the significance of my work" (cynicism), with response options ranging from 0 ("never") to 6 ("every day").

Engagement. We measured engagement with the 9-item version of the UWES (Schaufeli, Bakker, & Salanova, 2006). The items of the UWES tap the three dimensions of engagement: Vigor (3 items), Dedication (3 items), and Absorption (3 items). An example item is "I am enthusiastic about my job" (0 = "never", 6 = "always").

Statistical analyses

Two sets of analyses were conducted. First, we conducted a preliminary set of confirmatory factor analyses (CFA) to test the measurement model for the study variables. Model fit was assessed using the following criteria: indices are between .05 and .08 for the RMSEA and SRMR (Hu & Bentler, 1999) and values above .95 for the confirmatory fit index (CFI) and Tucker-Lewis index (TLI) are generally recommended for good-fitting models (Hu & Bentler, 1999). Building on these findings, the second set of analyses focused on the regression relations among the study variables. Specifically, for each demand, separate hierarchical multiple regression analyses were estimated using SPSS with engagement/burnout as the

criterion variable. In Step 1, control variables were entered (work time and education). In Step 2, predictor variables were entered (job demand, challenge and hindrance appraisal). The interaction variables were entered (two interactions between job demand and challenge/hindrance appraisal) in Step 3. We used centered variables to compute the interaction variables.

Results

Measurement model

Table 1 presents the fit indexes of several measurement models using CFA. First, we tested a model in which all items loaded on their corresponding hypothesized latent constructs. This 11-factor model (Model a: three job demands: emotional demands, role conflicts, and time urgency; six appraisals: challenge and hindrance appraisals of three demands respectively; engagement and burnout loading on distinct factors) provided favorable fit statistics, $\chi^2_{(1270)} = 2761.20, p < .001$; RMSEA = .047; CFI = .933; TLI = .927; SRMR = .041. The standardized factor loadings ranged from .71 to .93 (except for two items for the measurement of emotional demands, “Is your work emotionally demanding?” and “Are you confronted in your work with things that affect you emotionally?” with loadings of .43 and .64, respectively). We then compared this hypothesized model to four alternative measurement models (e.g., three challenge or hindrance appraisals forming a single factor). The results presented in Table 1 demonstrate that the best alternative model (i.e., Model d, in Model a three demands merged to form a single demand factor) also had poorer fit to the data ($\chi^2_{(1289)} = 35.9.00, p < .001$; RMSEA = .057; CFI = .900; TLI = .893; SRMR = .056) when compared to Model a, $\Delta\chi^2_{(19)} = 747.80, p < .001$). These findings demonstrated that our focal constructs are distinct from each other.

Table 1. *Findings of a Series of Confirmatory Factor Analyses of the Measurement Models of demands, appraisals and well-being*

Model	Description	χ^2	<i>df</i>	RMSEA	CFI	TLI	SRMR
Model a	All eleven factors load on their corresponding latent construct (i.e., three demands: emotional demands, role conflicts, and time urgency; six appraisals: challenge and hindrance appraisals of three demands respectively; engagement and burnout)	2761.20	1270	.047	.933	.927	.041
Model b	Model a, combining three challenge appraisals as one factor	4462.52	1289	.068	.857	.848	.056
Model c	Model a, combining three hindrance appraisals as one factor	4751.56	1289	.071	.844	.834	.063
Model d	Model a, combining three demands as one factor	3509.00	1289	.057	.900	.893	.056
Model e	Model a, combining, three challenge appraisals as one factor, three hindrance appraisals as one factor, and three demands as one factor	8800.26	1322	.104	.664	.650	.142

Challenge and hindrance ratings of demands

Table 2 shows that the challenge-hindrance ratings of each of the three demands correlated negatively, with correlations ranging from $-.58, p < .001$, for time urgency demands, to $-.65, p < .001$, for emotional demands. Thus, participants who appraised a particular demand as a challenge were less likely to consider that demand as a hindrance, and vice versa. However, although these correlations are moderate to strong (Cohen, 1988), even the $-.65$ correlation for emotional demands implies that nearly 58% of the variance in the challenge (hindrance) rating for this demand is not accounted for by its hindrance (challenge) rating, meaning that challenge and hindrance ratings are not just each other's opposites. Further, one-sample chi-square tests for the variance indicated that the *SDs* of all appraisals differed significantly from zero ($p < .001$), with the average *SD* being 1.48 on a 7-point scale. This shows that employees differ quite considerably in their appraisals of these demands.

Table 2. Means, Standard Deviations, and Correlations among the Study Variables. Reliabilities (Cronbach's alpha) on the Diagonal

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Education	1												
2. Worktime	.03	1											
3. Time Urgency	-.01	.01	(.89)										
4. Role conflict	-.09	-.01	.45	(.81)									
5. Emotional Demands	-.05	.01	.55	.50	(.76)								
6. Time Urgency CA	-.05	-.12	.14	.16	.04	(.89)							
7. Time Urgency HA	.09	.08	.14	.04	.18	-.58	(.89)						
8. Role conflict CA	-.13	-.09	.03	.28	.04	.60	-.41	(.91)					
9. Role conflict HA	.10	.11	.10	-.14	.09	-.39	.52	-.62	(.92)				
10. Emotional Demands CA	-.11	-.05	.01	.14	.01	.47	-.30	.68	-.42	(.93)			
11. Emotional Demands HA	.06	.05	.07	-.08	.05	-.35	.44	-.49	.65	-.65	(.92)		
12. Burnout	-.06	.14	.54	.37	.56	-.12	.30	-.18	.20	-.17	.19	(.94)	
13. Engagement	.06	-.04	-.34	-.26	-.47	.24	-.30	.29	-.20	.29	-.25	-.75	(.94)
<i>M</i>	2.95	41.42	4.05	3.77	2.80	4.77 [#]	3.67 [#]	4.12	4.22	3.74 [#]	4.43 [#]	3.04	4.53
<i>SD</i>	0.53	10.79	1.42	1.38	0.79	1.29	1.42	1.52	1.53	1.60	1.53	1.16	1.11

Note: $r \geq |.09|$, significant at $p < .05$; $r > |.13|$, significant at $p < .01$. CA = Challenge Appraisal, HA = Hindrance appraisal. [#] = the mean of the challenge rating for this demand differed significantly from the mean of the hindrance rating for this demand.

The Direct relationship between job demands and burnout – engagement

We hypothesized that job demands are negatively related to engagement (Hypothesis 1) and positively to burnout (Hypothesis 2). As expected, Table 3, Step 2, shows that engagement was negatively associated with time urgency ($\beta = -.37, p < .001$), role conflict ($\beta = -.37, p < .001$), and emotional demands ($\beta = -.48, p < .001$) (Hypothesis 1 supported). Burnout was positively associated with time urgency ($\beta = .54, p < .001$), role conflict ($\beta = .46, p < .001$), and emotional demands ($\beta = .58, p < .001$) (Hypothesis 2 supported).

Table 3. Regression Coefficients for the Moderation of Appraisals on the Relationships Between Job Demands and Work Engagement/ Burnout

Predictors	Step 1		Step 2		Step3	
	Burnout	Engagement	Burnout	Engagement	Burnout	Engagement
Work Time	.15**	-.09	.08*	-.03	.06	-.02
Education	-.06	.07	-.07*	.08*	-.08*	.09*
<i>Time Urgency</i>			.54***	-.37***	.51***	-.33***
Challenge Appraisals			-.05	.19***	-.08	.24***
Hindrance Appraisals			.21***	-.14**	.24***	-.16**
Time Urgency × TUCA					-.11*	.24***
Time Urgency × TUHA					.13**	-.02
R ²	.03**	.01*	.40***	.23***	.44***	.29***
Work Time	.15**	-.09	.10*	-.03	.08*	-.02
Education	-.06	.07	-.06	.08*	-.06	.09*
<i>Role Conflict</i>			.46***	-.37***	.45***	-.36***
Challenge Appraisals			-.22***	.38***	-.27***	.43***
Hindrance Appraisals			.12*	-.02	.12*	-.02
Role Conflict × RCCA					-.17**	.18***
Role Conflict × RCHA					.08	-.06
R ²	.03**	.01*	.26***	.22***	.31***	.26***
Work Time	.15**	-.09	.11**	-.04	.11**	-.04
Education	-.06	.07	-.06	.08*	-.05	.07*
<i>Emotional Demands</i>			.58***	-.48***	.56***	-.46***
Challenge Appraisals			-.10*	.25***	-.11*	.25***
Hindrance Appraisals			.09*	-.06	.12*	-.09
Emotional Demands × EDCA					-.11*	.15**
Emotional Demands × EDHA					.03	-.01
R ²	.03**	.01*	.39***	.32***	.41**	.35***

Note: *** $p < .001$, ** $p < .01$, * $p < .05$. All data reported here are standardized results. CA = Challenge appraisal, HA = Hindrance appraisal, TU = Time urgency, RC = Role conflict, ED = Emotional demands.

The Moderation Effects of Appraisals

In Step 3, we tested the moderating effects of appraisals on the relationships between various job demands and work engagement/burnout (Hypotheses 3-6). Table 3 shows that the interactions of challenge appraisal on the one hand and time urgency ($\beta = .24, p < .001$), role conflict ($\beta = .18, p < .001$), and emotional demands ($\beta = .15, p = .003$) on the other predicted work engagement, such that the negative relations of these demands with engagement were less negative when this particular demand was appraised as a challenge. We plotted these moderation effects in Figure 1 (for brevity we only presented the time urgency \times appraisal moderation effect, since the other significant moderation effects are very similar, and can be obtained from the first author). Follow-up simple slope tests showed that the regression coefficients of job demands on engagement were stronger when challenge appraisals were low (time urgency, $b = -.41, T = -9.37, p < .001$; role conflict, $b = -.43, T = -8.16, p < .001$; emotional demand, $b = -.84, T = -10.41, p < .001$) than when challenge appraisals were high (time urgency, $b = -.10, T = -2.01, p = .045$; role conflict, $b = -.15, T = -2.82, p = .005$; emotional demand, $b = -.45, T = -5.14, p < .001$). These results suggest that the detrimental effects of job demands on work engagement were weaker if a particular demand was appraised as being challenging than if it was not. Thus, Hypothesis 3 was fully supported.

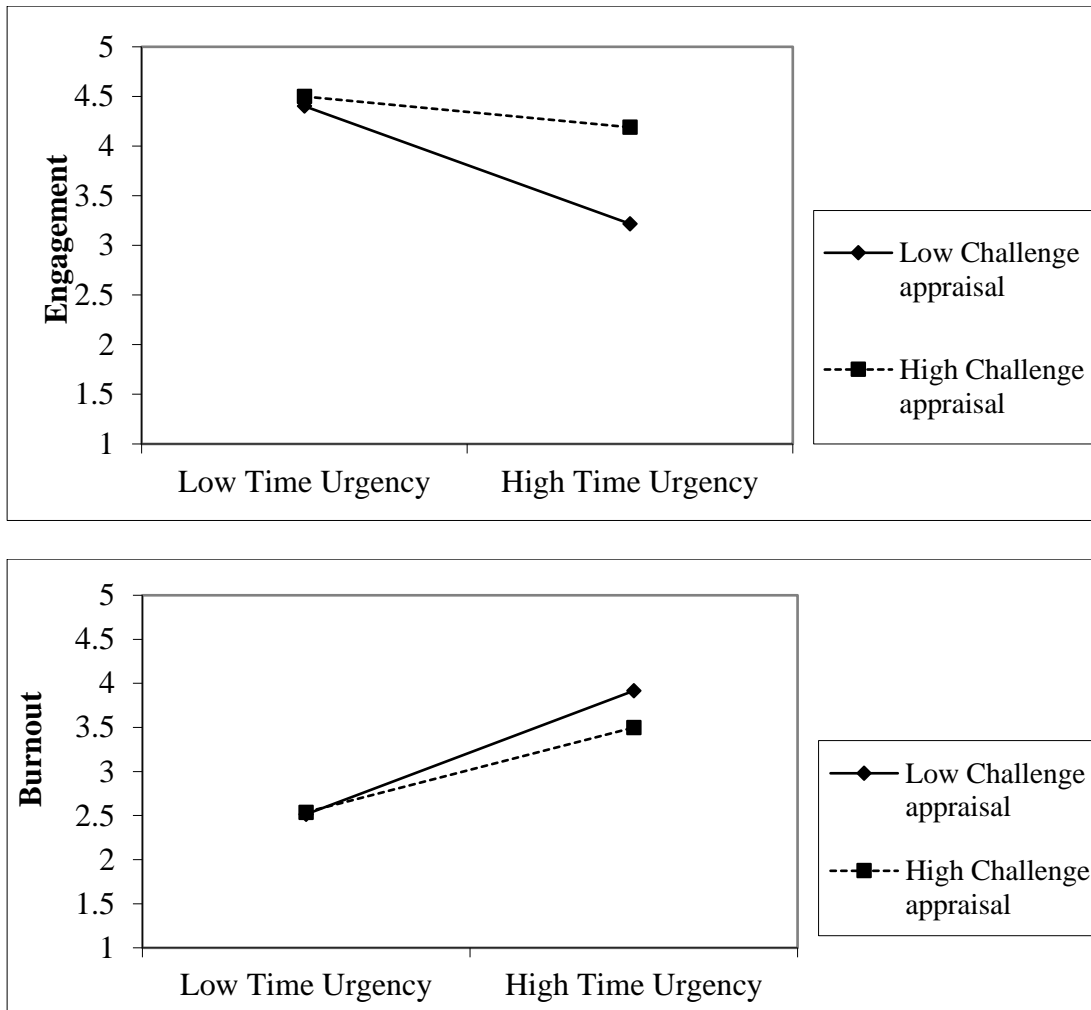


Figure 1. The Interactions Between Job Demands and Challenge Appraisals on Engagement (top) and Burnout (bottom)

Second, the interactions of challenge appraisal on the one hand and time urgency ($\beta = -.11, p = .02$), role conflict ($\beta = -.17, p = .001$), and emotional demands ($\beta = -.11, p = .02$) on the other predicted burnout. As expected, the positive relation of demands with burnout was weaker when challenge appraisal was high (see Figure 1). Specifically, the regression coefficients of job demands on burnout were stronger when challenge appraisals were low (time urgency, $b = .50, T = 12.1, p < .001$; role conflict, $b = .52, T = 9.74, p < .001$; emotional demand, $b = .99, T = 12.14, p < .001$) than when challenge appraisals were high (time urgency, $b = .34, T = 7.24, p < .001$; role conflict, $b = .25, T = 4.65, p < .001$; emotional

demand, $b = .68$, $T = 7.69$, $p < .001$). These results suggest that the health impairment effects of job demands on burnout were stronger if workers appraised these demands as being low-challenge (Hypothesis 4 supported). Interestingly, no significant moderation effects of hindrance appraisal and job demands on engagement were found (Hypothesis 5 not supported).

Lastly, of the interactions between demands and hindrance appraisal on burnout, only time urgency had a significant effect ($\beta = .13$, $p = .007$). Specifically, the positive regression coefficient of time urgency on burnout was stronger when hindrance appraisal was low ($b = .33$, $T = 7.25$, $p < .001$) than when hindrance appraisal was high ($b = .51$, $T = 11.22$, $p < .001$) (See Figure 2). Thus, the negative effect of job demands on burnout was stronger if individuals appraised that demand as highly hindering (Hypothesis 6 partially supported).

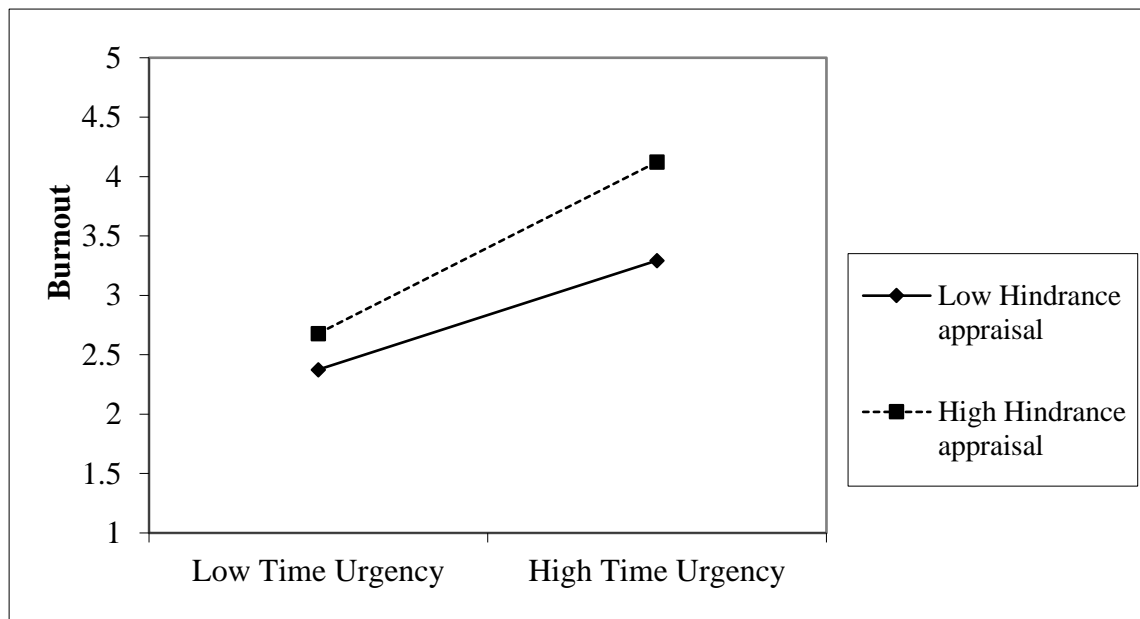


Figure 2. The Interaction Between Time Urgency and Hindrance Appraisals on Burnout

Discussion

This study aimed to advance our understanding of the relationship between job demands and employee well-being by integrating cognitive appraisal theory and person–context interaction theory (Magnusson & Stattin, 1996) in the Challenge-Hindrances demands framework. We focused on three different job demands (time urgency, role conflict, and emotional demands) and their associations with burnout and engagement. We examined (1) how particular job demands are appraised by employees; and (2) the moderating role of appraisals.

The findings presented in this study suggest that not all demands are created equal. Whereas some demands (such as emotional demands) are primarily appraised as hindrances, other demands (time urgency) are predominantly considered as challenges. Role conflict could not unambiguously be classified as a challenge or a hindrance demand. This is largely in line with Webster et al. (2011) who reported that although workload, role conflict, and role ambiguity were primarily appraised as challenges or hindrances, they could also be perceived as being both to varying degrees. Similarly, Searle, and Auton (2015) found that time pressure was appraised as a challenge to the same degree as it was appraised as a hindrance.

The moderation role of appraisals

In line with our predictions, we found a positive link between demands (time urgency, role conflict, and emotional demands) and burnout, and a negative association between selected job demands and engagement, which is consistent with previous studies (e.g., Albrecht, 2015; Demerouti et al., 2001; Lesener et al., 2018).

In addition, our finding that workers differ in the way they appraise particular demands could mean that the effects of demands on outcomes such as work engagement and burnout differ across workers. Our findings supported this reasoning. As expected, high job demands were associated with high levels of burnout, but this association was weaker for

those employees who appraise these demands as highly challenging. In the same vein, job demands were less negatively related to engagement for those who appraised the demands as highly challenging. The present findings are consistent with Li et al. (2017) who showed that the relationship between perceived rewards for creativity and creativity-related intrinsic motivation was especially positive when this reward was considered a challenge. Thus, the current study confirms previous findings that challenge appraisal can act as a moderator of the association between demands and outcomes.

Overall, the results of the present study largely underline the merits of including appraisal (especially challenge appraisal) as a moderator in job demands research. When including the interactions of demands and appraisals in the explanation of burnout and engagement, we found that this interaction added unique explained variance on employee well-being.

However, the results varied for the three demands and the two types of appraisal included in this study. Specifically, while we consistently found significant moderation effects of challenge appraisals of the three demands, this was not the case for hindrance appraisals (with the exception of time pressure). A potential explanation is that since job demands are associated with physiological and psychological costs per definition (cf. Demerouti et al., 2001), demands *always* contain a certain "hindering" aspect. The appraisal of such demands as hindrances (which is congruent with the definition of demands as being associated with certain costs) does not add much and will not impact their well-being, since employees who consider demands as hindrances just see their demands for what they are. Conversely, the appraisal of a job demand that is *incongruent* with the basic nature of the demands concept (i.e., when employees consider a demand as challenging) may trigger an additional, positive process beyond the "exhausting" effect of that demand, partly mitigating

its adverse effects on well-being. This is consistent with the “match/mismatch” argument (Folkman, 1984), which postulates that although appraising a stressful situation as uncontrollable is related to negative outcomes, these negative outcomes only occur if the reappraisal and coping do not alter the meaning of the situation to the person (Folkman, 1984). People who discover something positive in a negative situation show less distress than those who do not (Folkman, 1984; see for a review, Wortman & Silver, 1989). In line with this reasoning, an incongruent appraisal of job demands as challenging may alter the magnitude or basic nature of the relationship between demands (i.e., seeing a constraint as an opportunity) and well-being and how people to cope with such demand, partly mitigating the negative effect of job demands on employee well-being.

These results suggest that the mechanisms linking job demands to employee well-being are more complicated than has been assumed in the past. That is, the effects of job demands on well-being tend to vary as a function of type (challenge or hindrance) and individual variations in their appraisal, and the magnitude of these effects even seems to vary across different demands, namely, some demands (e.g., time urgency and emotional demands) could clearly be categorized as challenges/hindrances, while others could not (e.g., role conflict).

Theoretical Contributions

The current study contributes to the literature by confirming and expanding previous research in several ways: First, we extend job demands research, and specifically the challenge-hindrance demand framework, by examining how employees appraise particular job demands. The findings presented here convincingly demonstrate that not all demands are perceived similarly by all workers. Insofar as the a-priori categorization of challenge-hindrance demand framework the causal relationships assumed in current work-psychological models (e.g., Job

Demand-Resources theory, Demerouti et al., 2001; or the Job Demand-Control model, Karasek, 1979) hold up, our findings suggest that these models are perhaps need to consider the role of appraisals of job characteristics. Second, this research contributes to transactional stress theory (Lazarus & Folkman, 1984) and person-context interaction theory by examining cognitive appraisal, an individual characteristic, as a contextual factor on the relationship between job demands and employee well-being. While studies have reported cognitive appraisals as mediating mechanisms (e.g., LePine et al., 2016; Liu & Li, 2018; Webster et al., 2011), no studies have specifically examined how individual differences in appraisal impact the associations between job demands and employee well-being. Our study extends research in this area by providing evidence that appraisal is a major individual differences-factor (Li et al., 2017) that affects the associations between job demands and work "outcomes"; and including the interactions between job demands and challenge appraisals added unique explained variance on employee well-being. Therefore, our study opens a new domain of potential demanding work conditions (e.g., workload, job insecurity, role ambiguity) that may interact with cognitive appraisals in determining employee well-being. Finally, Folkman (1984) posits that the match/mismatch between a person's appraisal of controllability in a stressful situation and the extent to which the outcome is actually controllable influences outcomes in the second appraisal process. Our study extends this argument by showing that in the primary appraisal process this match/mismatch (i.e., congruent/incongruent) between appraisal (i.e., challenge and hindrance) and the nature of a demanding situation influences employee well-being. It would seem interesting to examine this reasoning more thoroughly, checking how congruent and incongruent appraisal of job demands (or resources) influences employee well-being.

Study limitations and future research

Although our findings consistently showed that among three selected job demands challenge appraisals moderate the demand–well-being relationship, we are still unclear the exact role of appraisal in the relation between job demands and work outcomes (i.e., either a moderator or a mediator, or both). Our measurement of appraisals (i.e., we assessed participants' general appraisal of particular job demands instead of measuring appraisals in reference to their current work experiences) precluded comparing the mediation and moderation role of appraisals (Hayes, 2013). Future longitudinal designs and diary studies are needed to test how employees perceive their job demands in their daily working situation, and to compare the expected mediation associations and moderating roles of appraisals that found in the present study. Moreover, although in the present study we did not focus on appraisal as an antecedent or consequence of well-being, it could be interesting to examine in future research how appraisal and well-being influence each other. For instance, over time experiencing burnout or engagement may affect appraisal ratings as well.

The second limitation pertains to the self-reported measurement method. Given the nature of the current research topic (appraisals, engagement, and burnout), it is fairly common to use self-report methods (Yang & Caughlin, 2017). Admittedly, there is a possible influence of common method bias on the results given the same rater is used to report on both work characteristics and outcomes (De Lange, Taris, Kompier, Houtman, & Bongers, 2003). Williams, Hartman, and Cavazotte (2010) recommended confirmatory factor analysis to identify and control for method bias. In the current study, we compared several measurement models and the hypothesized model showed a good fit, which provides some confidence that our findings were not heavily biased. The use of different raters (e.g., one's supervisor or colleague) of work outcomes and objective measurements are recommended in order to draw more definitive conclusions of the effects of job demands on well-being and the role of appraisals implied in our study.

Finally, this study focused exclusively on job demands. We did not examine the effects of (the appraisal of) job resources on the study outcomes, or their potential buffering effect on the associations between job demands and outcomes. The present study showed that demands are perceived differently by workers, and there seems to be no reason to assume that such differences will be absent for job resources such as job control and social support (Alarcon, 2011). This suggests that for resources, similar processes may be present as found for job demands. For example, Folkman (1984) suggests that when the appraisal of control does not match reality, the risk of maladaptive outcomes should be greater. If this reasoning is correct, we would expect that for job resources, a "congruent" appraisal of a resource as a challenge should not affect employee well-being (i.e., should not moderate the association between that resource and well-being). Conversely, an "incongruent" appraisal of a resource as a hindrance (mismatch of a situation and appraisal) may well impact the association between that resource and the study outcomes. Future research can examine how work characteristics (both demands and resources) interact with cognitive appraisals in determining employee well-being, and how a congruent/incongruent appraisal influences the associations between job characteristics and employee well-being.

Practical implications

In spite of these limitations, our findings may have important practical implications. First, in a high-demand situation it is important to consider how employees appraise these demands. Employees benefit by appraising such demands as highly challenging (especially in demanding situations), and doing so may lead them to become more engaged in their work activities (Li et al., 2017). Managers and HRM departments may distinguish among employees with different appraisal dispositions and may encourage employees to consider job demands as challenges. For example, managers may emphasize the potential benefits and the

opportunities for growth offered by particular demands when communicating with their subordinates. Second, when focusing on the selection process, it may be beneficial for organizations to hire employees who tend to appraise the specific demands that pertain to a particular job as a challenge. For example, if a job requires to work in a high time pressure context, recruiting individuals who tend to appraise time pressure as high challenging will benefit both the organization and the employee. Note that such measures (i.e., training programs and selection practices) should be part of the "bundle" of HRM tools, practices and strategies employed by an organization's HR department. Research has shown that such practices are most effective if they are part of an internally consistent HR bundle (MacDuffie, 1995). Thus, organizations are most likely to profit from such measures if they fit well with other HR tools used by the organization.

Conclusion

Our study extends research on the challenge-hindrances demands framework by adding appraisals, showing that workers may appraise demands as both challenges and hindrances, and examining the role of appraisals as moderator. Across three selected demands, we found consistent moderation effects of challenge appraisals, and demonstrated that the interaction of demands and their appraisal as a challenge or a hindrance often accounts for a unique part of the variance in this study's outcome variables. Apparently, one man's meat can indeed be another man's (or woman's) poison, since employees tend to appraise job demands differently. Therefore, we encourage future researchers to consider the moderation role of appraisal in their research on the effects of job characteristics as well as in the theories they develop.

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Chapter 4

Challenges or Hindrances? Implications of Work Characteristics Appraisals for Employees' Well-Being

Author contributions: Peikai Li, Toon W. Taris, Maria C. W. Peeters, Yejun Zhang (Conceptualization; Validation; Writing-review & editing). Peikai Li (Data curation; Formal analysis; Investigation; Methodology; Project administration; Software; Visualization; Writing-original draft); Maria C. W. Peeters and Toon W. Taris (Project administration; Supervision); Yejun Zhang (Investigation; Methodology; Formal analysis of Study 2; Resources).

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Abstract

Previous research on the association between job characteristics and employee well-being has returned mixed results. In particular, the possible impact of individual appraisal of these job characteristics has not been well-acknowledged. To address this limitation, we drew on appraisal theory and examined (a) how workers appraise particular job characteristics, and (b) how these appraisals affect the relationships between these job characteristics and well-being (i.e., work engagement and burnout). We tested our hypotheses across two studies. In a cross-occupation sample (Study 1, $n = 514$), we found that job demands and resources can be appraised as both challenges and hindrances. In addition, challenge appraisals can mitigate the detrimental impact of job demands on engagement and burnout; and hindrance appraisals can strengthen the detrimental effects of job demands on burnout. Further, whereas hindrance appraisals of job resources reduce its beneficial effect on engagement and burnout. In Study 2 ($n = 316$ nurses in a hospital), the results further found that challenge appraisals of job demands can reduce their impact on burnout while challenge appraisals of job resources will strengthen their beneficial effect on employee engagement and burnout. We discuss the implications as well as future research directions.

Keywords: challenge appraisal, employee well-being, hindrance appraisal, job demands, job resources

Introduction

Although scholars have often classified job characteristics as either job demands or job resources (e.g., Demerouti et al., 2001), this distinction has not remained unchallenged. Drawing on stress research, organizational researchers have expanded traditional job characteristics theory (e.g., the JD-R model, Demerouti et al., 2001; the Job Demand-Control model, Karasek, 1979) by recategorizing job demands as either challenge or hindrance demands (e.g., Teng et al., 2020; van den Broeck et al., 2010). Although this distinction has certainly advanced our understanding of how different types of demands relate to important organizational and individual outcomes, the role of employees' subjective appraisals of their job characteristics has not yet been well-acknowledged and needs further investigation (González-Morales & Neves, 2015; Parker, 2014).

Appraisals are defined as an individual's interpretation of particular job characteristics as having the potential for personal gain and growth (challenges) or as constraints (hindrances; Cavanaugh et al., 2000; LePine et al., 2016). Building on the notion that individual functioning results from the interaction between individual and environmental factors (i.e., person-context interaction theory, Magnusson & Stattin, 1996), Li et al. (2020) demonstrated that demands can to some extent be appraised simultaneously as challenges and hindrances, and that individuals' different appraisals can moderate the job demands–employee well-being relationships. However, as employees do not only face job demands but also job resources in their work situation, it would seem that the effects of job resources on well-being may also be contingent upon individual appraisal. Building on this argument and recent empirical studies (e.g., Li et al., 2017; Li et al., 2020), we propose appraisals may influence the magnitude of the effects of job demands and job resources on employee well-being.

Our study advances the job characteristics literature by examining (a) how employees appraise their job characteristics, and (b) whether and how these appraisals influence job characteristics–well-being relationships. First, instead of using a priori-categorization of particular job characteristics (i.e., job demands and resources) as either challenges or hindrances (Bakker & Demerouti, 2017), we empirically test how employees appraise these job characteristics and how the appraisals affect their well-being. In doing so, we aim to extend the Job Demands-Resources model and Challenge-Hindrance Stressor Framework by looking at the potential differentiated effects of the same job characteristics for different employees, and expand the appraisal literature by investigating how the appraisal of resources is related to well-being in contrast to the predominant focus on appraisal of job demands in the previous research. Second, appraisal-based studies have predominantly taken appraisal as a mediating variable in the job characteristics–outcomes relationships (e.g., Espedido & Searle, 2018; Liu & Li, 2018; Ohly & Fritz, 2010). We extend this research by testing how individual differences in appraisals influence the degree to which employees react to their job demands and job resources. This also responds to O'Brien and Beehr's (2019) argument that “appraisals could be moderators, although little research has reported on that possibility” (p. 6). Lastly, our study advances previous research by investigating both challenge and hindrance appraisals of job characteristics. This is important, as both types of appraisals can occur simultaneously with regard to a situational demand (Folkman, 1984; Gilboa et al., 2008).

Challenge and Hindrance Job Characteristics

The Job Demands-Resources (JD-R) model (Demerouti et al., 2001) divides work characteristics into two categories: job demands and job resources (Bakker & Demerouti, 2017). Job demands are defined as the physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and

emotional) effort and that are therefore associated with certain physiological and/ or psychological costs (Bakker et al., 2004). Examples are administrative hassles, emotional conflict, and role overload (Nahrgang et al., 2011). Job resources refer to the physical, psychological, social, or organizational aspects of the job that are functional in achieving work goals and/or that stimulate personal growth and development (Bakker et al., 2004). Examples include job autonomy, social support, and coworker support (Crawford et al., 2010).

Although previous studies have explored the relationships between job demands and resources and their outcomes (Bakker & Demerouti, 2017), not all findings are consistent with the hypothesized relationships (Olafsen et al., 2018). For example, Bakker et al. (2003) found that workload was positively rather than negatively associated with dedication (cf. Van Den Broeck et al., 2008). Similarly, in a longitudinal study, Mauno et al. (2007) reported that time demands were positively related to absorption. These findings suggest a need to revisit the relevant theories and examine the possible moderators that might alter these relationships. In addition, empirical studies showed that an excess of autonomy seems to have negative effects on employee well-being (Stiglbauer & Kovacs, 2018; Wielenga-Meijer et al., 2011). Consequently, researchers have begun to argue that (a) not all demands are created equal and (b) job resources can have detrimental effects as well (Stiglbauer & Kovacs, 2018; Wielenga-Meijer et al., 2011).

The discussion regarding the inconsistent effects of job demands currently mainly occurs within the challenge-hindrance demands framework (Cavanaugh et al., 2000; Olafsen et al., 2018). *Challenge demands* are defined as job demands that require efforts but that also present the potential for personal growth and rewards (e.g., workload, time pressure, and job complexity). *Hindrance demands* refer to job demands that interfere with or inhibit an individual's ability to achieve valued goals and that thwart growth and gains (e.g., role

conflict, role ambiguity, and organizational constraints). Meta-analytical reviews have supported the assumption that hindrance demands are associated with negative outcomes such as higher turnover and withdrawal behavior, whereas challenge demands are positively related to more desirable employee attitudes (e.g., higher job satisfaction, organizational commitment, and lower turnover intentions), job performance (LePine et al., 2005; Podsakoff et al., 2007), and safety outcomes (Clarke, 2012).

An alternative explanation for the inconclusive effects of job demands on outcomes draws on the idea that individual appraisal may be relevant as well. An appraisal-based approach assesses why some employees might perceive a particular demand as a challenge, whereas others perceive the same demand as a hindrance. Moreover, it also allows for the fact that some demands can be perceived concurrently as challenging and hindering aspects. For example, Webster et al. (2011) reported that workers perceived job demands such as workload, responsibility, role conflict, and role ambiguity concurrently as challenges and hindrances. In a related vein, Searle and Auton (2015) found that workers appraised time pressure as a challenge to the same degree as a hindrance. In summary, several empirical studies support the merits of including appraisals of job demands in work psychological research by demonstrating that these appraisals consistently explain unique variance in a study's outcome variables (e.g., creative performance, Li et al., 2018; affect, Searle & Auton, 2015). Thus, it is imperative to extend current research to consider the role of appraisals on the effects of job characteristics.

The Role of Cognitive Appraisals of Job Characteristics

According to Lazarus and Folkman's (1984) transactional theory of stress, one's response to a stressful event depends on how one appraises the situation. At the primary appraisal stage, a person will evaluate how stressful the situation is. At the secondary stage of the appraisal –

which occurs almost at the same time – people will evaluate what, if anything, can be done to overcome or to prevent harm, or to improve the prospects for benefit (Folkman et al., 1986). A person usually evaluates a situation based on how much is at stake and how controllable the situation is. If a situation is seen as a *challenge*, it will be viewed as taxing, but also provides opportunities for personal gains, such as mastery, learning, or personal growth. Challenge appraisal thus indicates that with effort, the job characteristics can be mastered (Skinner & Brewer, 2002). Conversely, *hindrance appraisals* are defined as an individual's subjective interpretation that job characteristics have the potential to interfere with or thwart an individual to achieve valued goals (Cavanaugh et al., 2000; Searle & Auton, 2015). The transactional theory of stress further denotes that primary appraisal is an essential way by which an individual assesses the meaning and the significance of the situation and the major psychological process that connects stressors to outcomes. In addition to the degree to which people would evaluate their situation as a challenge and/or hindrance stressor, transactional theory of stress also contends that primary appraisal impacts the valence of outcomes an individual will experience, such as strain, well-being, motivation and performance (Lazarus & Folkman, 1984; LePine et al., 2005).

Appraisal of Job Demands as a Boundary Condition

Following the transactional theory of stress (Lazarus & Folkman, 1984), studies on the appraisal of job characteristics usually treat appraisal as a mediator (Boswell et al., 2004; Liu & Li, 2018; Mitchell et al., 2019; Sessions et al., 2019; Tuckey et al., 2015). However, O'Brien and Beehr's (2019) pointed out that "appraisals could be moderators" (p. 6). We propose that appraisals can also serve as a moderator. Work in general is taxing on personal resources (Demerouti et al., 2001), but if workers appraise a particularly demanding situation as something that can be overcome and that may lead to growth and rewards, the presumed detrimental effect on employee well-being will be weaker (Li et al., 2020). On one hand, such

a challenge appraisal contributes to employee motivation in dealing with job demands (e.g., Liu & Li, 2018). On the other hand, high challenge appraisal has been established as an adaptive function in dealing with stressful events, as it is associated with more confident coping expectancies and more beneficial perceptions of stressful events (Skinner & Brewer, 2002). As a result, high challenge appraisal may buffer the detrimental effect of job demands.

In addition, previous studies have shown that high job demands are associated with increases in burnout (e.g., the JD-R model, Demerouti et al., 2001) and decreases in work engagement (e.g., Hu et al., 2017). Thus, we expect that job demands (i.e., time urgency, role conflict and emotional demands) will be positively related to burnout and negatively to engagement. These demands were chosen because meta-analysis supported that they are well-established and important job demands in relation to employee well-being (Alarcon, 2011). Further, these demands are not consistently categorized as a challenge or a hindrance (e.g., Albrecht, 2015; Baethge et al., 2019; Bakker & Sanz-Vergel, 2013; Crawford et al., 2010; Mazzola & Disselhorst, 2019; Zhang et al., 2013). We expect a negative link between these demands and work engagement and a positive relationship between them and burnout.

Hypothesis 1: Job demands (i.e., time urgency, role conflict, and emotional demands) will be positively related to burnout and negatively related to engagement.

Building on the transactional theory of stress (Lazarus & Folkman, 1984) and empirical evidence (e.g., Li et al., 2017), we propose that individual differences in appraisals are likely to affect how employees deal with their job demands and, thus, the effects of exposure to these job demands. This theory suggests that appraisal is essential as it determines a person's perception of the meaning and significance of stressful events for his/her well-being; as well as to what extent a situation can be changed or accepted (Folkman & Lazarus, 1980). In particular, information about appraisals will determine how one will attempt to cope

with stressful situations. Coping refers to a process in which individuals “constantly change cognitive and behavioral efforts to manage specific external and/or internal demands” (Lazarus & Folkman, 1984, p.141). Two types of coping exist: (a) avoidance-oriented coping (i.e., avoidance of thinking about the job demands or distancing themselves from the demands required), and (b) problem-focused coping (e.g., deliberate efforts to solve the problem or efforts to change the situation). When a hindering environmental condition was perceived as nothing can be done to change it, avoidance-focused coping is more likely to occur. Conversely, if a situation is appraised as amenable to change, problem-focused coping is more probable (Lazarus & Folkman, 1984). Since job demands can be appraised as both challenges and hindrances (Folkman, 1984; Searle & Auton, 2015; Webster et al., 2011), for workers who perceive a particular job demand as something that is controllable and can be overcome and that may lead to growth and rewards, employees are more likely to take a problem-focused coping. Thus, the assumed adverse effects of this demand on burnout and engagement will be relatively small. In contrast, when workers appraise a particular demand as a hindrance, the potential for constraints and thwarted growth will lead them to adopt an avoidance-oriented approach (Lazarus & Folkman, 1984) and to experience stress, and this would magnify the hypothesized adverse effects of this demand. Therefore, we expect that:

Hypothesis 2: Challenge appraisal moderates the negative relationships between job demands (i.e., time urgency, role conflict, and emotional demands) and engagement, such that the relationships are weaker when challenge appraisal is high.

Hypothesis 3: Challenge appraisal moderates the positive relationships between job demands (i.e., time urgency, role conflict, and emotional demands) and burnout, such that the relationships are weaker when challenge appraisal is high.

Hypothesis 4: Hindrance appraisal moderates the negative relationships between job demands (i.e., time urgency, role conflict, and emotional demands) and engagement, such that the relationships are stronger when hindrance appraisal is high.

Hypothesis 5: Hindrance appraisal moderates the positive relationships between job demands (i.e., time urgency, role conflict, and emotional demands) and burnout, such that the relationships are stronger when hindrance appraisal is high.

Appraisal of Job Resources as a Boundary Condition

Premised on JD-R model, job resources are supposed to lead to desirable outcomes (e.g., higher engagement and lower well-being); however, some perspectives shed light on how job resources might backfire as well. Both Warr's vitamin model (which stipulates non-linear relationships between job characteristics and employee well-being; Warr, 1987) and person-environment (PE) fit theory (Edwards, 1991) suggest that negative outcomes may result from an excessive amount of some job resources. If environmental resources are not compatible with employees' standards, employees will experience misfits and, consequently, a decrease in their well-being and outcomes (Edwards, 1991; van Vianen, 2018). For example, Wielenga-Meijer et al. (2011) found that increases in autonomy may have detrimental effects on learning outcomes. Similarly, experimental studies found that social support can also elicit negative reactions (Deelstra et al., 2003). A theoretically possible reason for the detrimental effect of resources draws on how employees appraise their resources. For instance, receiving instrumental social support at work will sometimes have an undesirable effect as it triggers feelings of inferiority and incompetence, which threatens one's self-esteem (Fisher et al., 1982). As Wielenga-Meijer et al. (2011) argued, the reason why autonomy fosters people's motivation to learn is possible that it leads to increased levels of *challenge*, which implies that resources can be challenging for employees.

In line with the cognitive appraisal of job demands, employees may experience job resources to some degree as both a challenge and/or a hindrance (Schaufeli & Taris, 2014). When an employee experiences a lack of resources, this might imply that they must spend more effort to achieve work goals. According to the JD-R model (Bakker & Demerouti, 2017), effort expenditure is a key characteristic of a job demand, which means that a lack of resources may also be construed as a job demand. Because job demands are perceived differently by workers (Searle & Auton, 2015; Webster et al., 2011), resources may be subject to similar individual variations in appraisals. Specifically, employees may perceive a particular job resource both as a challenge and a hindrance. For instance, social support could be appraised negatively (i.e., hindrance), as it may threaten one's self-esteem (Fisher et al., 1982); it can also be appraised as a challenge, as it provides resources for employees (Bakker & Demerouti, 2017). On the other hand, previous studies have shown that exposure to job resources could be a predictor of (dis)engagement (Bakker & Demerouti, 2017) and a decrease in burnout (e.g., Hu et al., 2017). In the current study, we chose autonomy, social support (of one's colleagues and supervisor), and feedback from others as typical job resources. These resources were selected because meta-analytic reviews have shown that these are well-established resources when predicting burnout and work engagement (Christian & Slaughter, 2007). Therefore, based on theoretical arguments (e.g. the JD-R model, Demerouti et al., 2001) as well as empirical research (e.g., Hu et al., 2017), we propose that:

Hypothesis 6: Job resources (i.e., autonomy, colleague support, supervisor support, feedback) will be positively related to work engagement and negatively related to burnout.

Further, we argue that the magnitude of the job resources–well-being relationship will vary as a function of appraisal. Although work is taxing on personal resources, individuals with high job resources are better able to cope with their work-related demands than others (Schaufeli & Taris, 2014). Thus, appraising resources as challenging and allowing for

potential growth and opportunities will have more beneficial effects on employee well-being than seeing such resources as hindering. Conversely, seeing a job resource as a hindrance and focusing on its potential constraints may have detrimental effects on its associations with the outcomes (e.g., Fisher et al., 1982). For example, high levels of autonomy are likely to turn into “unavoidable requirements” that create a seemingly intractable information problem, and it is hard enough to gather information and make a choice (e.g., Schwartz et al., 2002). Thus, we propose that seeing a job resource as a hindrance (seeing its *gain as pain*), the potential for constraints will lead employees to be reluctant in adopting an approach-oriented coping strategy (Lazarus & Folkman, 1984), which will undermine the motivational effects of this resource. Therefore, we hypothesize that challenge and hindrance appraisals moderate the relationship between job resources and employee well-being.

Hypothesis 7: Challenge appraisal moderates the positive relationships between job resources (i.e., autonomy, colleague support, supervisor support, feedback) and engagement, such that the relationships are stronger when challenge appraisal is high.

Hypothesis 8: Challenge appraisal moderates the negative relationships between job resources (i.e., autonomy, colleague support, supervisor support, feedback) and burnout, such that the relationships are stronger when challenge appraisal is high.

Hypothesis 9: Hindrance appraisal moderates the positive relationships between job resources (i.e., autonomy, colleague support, supervisor support, feedback) and engagement, such that the relationships are weaker when hindrance appraisal is high.

Hypothesis 10: Hindrance appraisal moderates the negative relationships between job resources (i.e., autonomy, colleague support, supervisor support, feedback) and burnout, such that the relationships are weaker when hindrance appraisal is high.

Overview of Studies

We conducted two studies to test our hypotheses. In Study 1, we tested our hypotheses by asking employees' *general* appraisal of certain job characteristics in scenarios in a sample of working adults from multiple organizations from China. In Study 2, we aim to replicate our findings in a sample of nurses from a single organization (i.e., all participants had similar working characteristics), where we measured appraisal by having these nurses assess their *own* job characteristics.

Study 1 Method

Procedures and Participants

The participants in this study were recruited through the online platform *SoJump*, which is similar to MTurk and Qualtrics. We sent participants an introductory email including a link to the online questionnaire. All participants (consisting of employees holding a full-time job in a broad variety of occupations) joined voluntarily and they were assured that their responses would stay anonymous. We sent the questionnaires to 2,611 Chinese employees and received 525 completed questionnaires in return (overall response rate of 20.11%). As a reward for completing the survey, participants received the equivalent of €1.67 in Chinese RMB. Eleven participants were deleted based on their response time, which showed that they completed the survey in a period over three standard deviations longer than the sample mean time (Curran, 2016). This resulted in a final sample of 514 participants. The average age of these participants was 33.77 years; the average organizational tenure was 7.30 years. There were 292 women (56.8%) in the sample, and participants averagely worked 42.29 hours a week. Most of the participants held a bachelor's degree (73.2%).

Measures

All questionnaires were in Chinese. Where applicable, we used scales that have been validated in the Chinese context. Otherwise, we followed the back-translation process to

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ensure the semantic equivalence (Brislin et al., 1973). The original English items were first translated into Chinese by the first author and then translated back into English by another two researchers. Then together with two psychology professors, we compared the English and Chinese versions of measurement items to guarantee accuracy and made modifications for some minor discrepancies. Unless otherwise indicated, items were scored on 7-point Likert scales (1 = *strongly disagree* and 7 = *strongly agree*).

Job Demands

Time urgency was measured with four items (e.g., Maruping et al., 2015; Rodell & Judge, 2009). A sample item is “The amount of time provided to complete my tasks is short”.

Cronbach's alpha was $\alpha = .86$. *Role conflict* was measured with three items from the Cross-Cultural Role Conflict, Ambiguity, and Overload Scale (Peterson et al., 1995). A sample item is “Different people quite often ask me to do the same thing in different ways”. Cronbach's alpha was $\alpha = .84$. *Emotional demands* were assessed with four items from the Emotional demands scale (Peeters et al., 2005). An example is “Does your work bring you in upsetting/disturbing situations?” (1 = *never* and 5 = *often*). Cronbach's alpha was $\alpha = .76$.

Job Resources

Colleague support was measured with 4 items from Peeters et al. (1995). A sample item is “If needed, my colleagues help me with a certain task” (1 = *never* and 5 = *often*). Cronbach's alpha was $\alpha = .65$. For *supervisor support*, we used the same items but replaced “colleague” with “supervisor”. Cronbach's alpha was $\alpha = .72$. We used three items from the Work Design Questionnaire (WDQ, Morgeson & Humphrey, 2006) to measure *feedback from others*. An example item is “I receive a great deal of information from my manager and coworkers about my job performance”. Cronbach's alpha for this scale was .65. Two items from the WDQ

were used to assess *autonomy*, including “The job provides me with significant autonomy in making decisions”. Cronbach's alpha was $\alpha = .81$.

Appraisals of Demands and Resources

To measure appraisals, we used the Challenge and Hindrance Appraisals scale (Searle & Auton, 2015). The challenge and hindrance appraisals of each demand and resource were measured separately. Specifically, for each of the three demands and four resources included in our study, participants were asked to indicate to what extent they considered this specific job characteristic as a challenge or a hindrance. For each job characteristic, challenge and hindrance appraisals were measured using two separate four-item scales. In the introduction of these challenge/hindrance scales, the items tapping the job characteristic to be appraised were included in a slightly rephrased form. Taking feedback from others as an example, the introduction reads “Imagine the following situation: Chris says ‘*on my job, I receive feedback on my performance from other people in my organization, and other people in the organization, such as managers and coworkers, provide information about the effectiveness (e.g., quality and quantity) of my job performance.*’ ” Then we asked participants “In general, I believe that having a job like Chris’s ...”, which was followed by the two four-item sets tapping challenge appraisal (e.g., “... will make the experience educational”) and hindrance appraisal (e.g., “... will restrict my capabilities”). Similar scenarios were developed for other job resources and demands. Cronbach’s alphas for these scales ranged between .76 to .91 (see Table 2).

Well-being

Work engagement was assessed using nine items (e.g., “At my work, I feel bursting with energy”) from the Utrecht Work Engagement Scale (Schaufeli et al., 2006). Cronbach’s alpha was .93. *Burnout* was measured with nine items of the Chinese version (Hu & Schaufeli,

2011) of the Maslach Burnout Inventory-General Survey (MBI-GS, Maslach et al., 1986).

Sample items are “I feel used up at the end of a workday” (0 = *never* and 6 = *every day*).

Cronbach’s alpha for this scale was .92.

Analytical Strategy

First, we conducted confirmatory factor analyses (CFA) to test the measurement model. We used the maximum likelihood estimation approach and conducted the analysis in Mplus

(Muthén & Muthén, 1998-2011). Then, we tested the hypotheses using regressions in SPSS.

To maintain adequate power for detecting effects (Cohen et al., 2013), we utilized a piecemeal approach and tested the moderation effects in separate models. To ease interpretation, we used centered variables when computing the interaction terms (Hayes, 2013). We further tested our hypotheses while controlling for social demographics (i.e., age, gender, education, tenure, work time, and industry). The pattern of the results did not change, supporting the robustness of the findings.

Study 1 Results

CFA Results

We first conducted CFA to test the measurement model. In the first model, all items loaded on their corresponding hypothesized constructs. This 23-factor model yielded good fit statistics ($\chi^2_{(3232)} = 5,459.85, p < .001$; RMSEA = .04; CFI = .92; TLI = .91; SRMR = .04) against five alternative measurement models. The results are presented in Table 1. In addition, to examine the potential common method bias, we tested a model where an additional unmeasured latent method factor was included. The results showed that the common method factor explained 6.8% of the variance in the measurement items, so it did not impose an undue influence on our findings.

Challenge and Hindrance Ratings of Job Characteristics

Table 2 summarizes the descriptive statistics, internal consistency reliabilities, and zero-order correlations of the study variables. This Table shows that time urgency was more likely considered a challenge ($M = 4.42$, $SD = 1.37$) than a hindrance ($M = 4.17$, $SD = 1.42$; $T = 2.43$, $p = .02$). However, role conflict ($M_{\text{challenge}} = 4.10$, $SD = 1.41$; $M_{\text{hindrance}} = 4.33$, $SD = 1.42$; $T = -2.17$, $p = .03$) and emotional demands ($M_{\text{challenge}} = 3.80$, $SD = 1.54$; $M_{\text{hindrance}} = 4.55$, $SD = 1.48$; $T = -6.53$, $p < .001$) were more often perceived as a hindrance than as a challenge. As for job resources, the results in Table 2 show that autonomy was more likely considered a challenge ($M = 5.53$, $SD = 0.91$) than a hindrance ($M = 2.92$, $SD = 1.45$; $T = 28.82$, $p < .001$). Similar results were found for supervisor support ($M_{\text{challenge}} = 5.35$, $SD = 0.95$; $M_{\text{hindrance}} = 3.23$, $SD = 1.42$; $T = 23.58$, $p < .001$), feedback from others ($M_{\text{challenge}} = 5.38$, $SD = 0.95$; $M_{\text{hindrance}} = 3.11$, $SD = 1.44$; $T = 26.2$, $p < .001$), and colleague support ($M_{\text{challenge}} = 5.26$, $SD = 0.98$; $M_{\text{hindrance}} = 3.24$, $SD = 1.49$; $T = 22.22$, $p < .001$). In addition, the SD s of all appraisals were different from zero, with the average SD s being 1.44 for demands and 1.20 for resources (on a 7-point Likert scale). This demonstrates that employees are quite different in their appraisals of these job characteristics (see Table 2).

Table 1. *Results of Confirmatory Factor Analyses in Study 1*

Model	Chi-Square	df	RMSEA [90% CI]	CFI	TLI	SRMR	AIC	BIC
23-factor parceled	5459.85	3232	.04[.035, .038]	.92	.91	.04	129566.82	131721.87
23-factor not parceled	7616.54	4402	.04[.036, .039]	.90	.89	.04	151167.62	153488.12
26 factor	7463.87	4330	.04[.036, .039]	.90	.89	.04	151158.95	153784.89
11-factor	15065.95	3430	.08[.08, .083]	.58	.56	.13	138776.91	140092.01
13-factor	9675.82	3407	.06[.058, .061]	.77	.76	.06	133432.79	134845.46
8-factor	10741.25	3457	.06[.063, .065]	.73	.06	.07	134398.22	135598.77
23-factor parceled with common method effects	5442.23	3231	.04[.035, .038]	.92	.91	.04	129551.20	131710.49
1-factor	23108.92	3485	.11[.103, .106]	.28	.27	.16	146709.89	147791.65

Note. RMSEA = root mean square error of approximation, CFI = comparative fit index, TLI = Tucker–Lewis index, SRMR = standardized root mean residual. CI = Confidence interval, AIC = Akaike information criterion, BIC = Bayesian information criterion.

23-factor model-parceled: 3 demands: time urgency, role conflict, and emotional demands; 4 resources: autonomy, feedback, colleague support, and supervisor support; 7 challenge and 7 hindrance appraisals of demands and resources: and 2 outcomes with 9 engagement items were mean-parceled as three indicators based on the three engagement dimensions and loading on one latent engagement factor; 9 burnout items were mean-parceled as two indicators representing exhaustion and cynicism, and loading on one latent burnout factor);

23-factor not parceled: 23-factor model-parceled with 9 items of engagement loaded on one, and 9 items of burnout loaded on another latent factor

26-factor: 23-factor not parceled with 2 outcomes loaded as 5 factors: vigor, dedication, absorption, exhaustion and cynicism

11-factor: 23-factor model-parceled with seven challenge appraisals into one, and seven hindrance appraisals loaded on one factor

13-factor: 11-factor splitting appraisals as 4 factors: challenge/hindrance appraisals of demands and challenge/hindrance appraisals of resources

8-factor: 11-factor combining three demands into one factor, and four resources into another factor

23-factor parceled with common method effects: 23-factor model-parceled added a latent method factor allowing all items loaded on the method factor

1-factor model: with all variables loaded onto one factor.

Table 2. Means, Standard Deviations, and Correlations Among the Study Variables in Study 1

Variable	Mean	SD	Skewness	Kurtosis	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	33.77	7.14	1.27	1.83	1											
2. Gender	1.57	0.50	-0.28	-1.93	-.21**	1										
3. Education	2.89	0.62	-0.78	2.43	-.16**	.01	1									
4. Work time	42.69	10.25	-0.69	5.01	-.05	-.02	-.05	1								
5. Tenure	7.30	6.11	2.36	7.09	.65**	-.18**	-.06	-.10*	1							
6. Time urgency	4.40	1.34	-0.36	-0.73	.04	-.09*	.14**	.12**	.03	(.86)						
7. Role conflict	4.07	1.48	-0.24	-0.93	-.05	-.03	.06	.00	-.04	.53**	(.84)					
8. Emotional demand	2.90	0.77	0.05	-0.67	-.06	.07	.02	.05	-.09*	.49**	.51**	(.76)				
9. Autonomy	4.68	1.48	-0.61	-0.42	-.01	.07	.08	-.13**	.01	-.21**	-.21**	-.25**	(.81)			
10. Colleague support	3.44	0.70	-0.39	0.09	-.04	-.02	.02	-.06	-.01	-.17**	-.16**	-.18**	.20**	(.65)		
11. Supervisor support	3.29	0.75	-0.43	0.02	-.02	.01	.05	-.13**	.01	-.19**	-.24**	-.29**	.41**	.52**	(.72)	
12. Feedback	3.54	0.78	-0.54	0.03	.00	-.07	.05	.00	-.01	-.07	-.16**	-.17**	.17**	.48**	.51**	(.65)
13. Time urgency CA	4.42	1.37	-0.51	-0.47	.12**	-.09*	.08	-.15**	.15**	.15**	.13**	.00	.17**	.02	.03	.03
14. Time urgency HA	4.17	1.42	-0.26	-0.86	-.10*	.08	.07	-.02	-.08	.13**	.10*	.26**	-.03	.03	.06	.00
15. Role conflict CA	4.10	1.41	-0.36	-0.74	.18**	-.04	.05	-.14**	.18**	.15**	.19**	.02	.19**	.03	.08	.05
16. Role conflict HA	4.33	1.42	-0.36	-0.71	-.12**	.04	.07	.04	-.13**	.13**	.06	.22**	-.10*	-.02	-.09*	-.09
17. Emotional demand CA	3.80	1.54	-0.04	-1.13	.17**	-.13**	.05	-.18**	.19**	.11*	.11*	.03	.14**	.03	.03	.01
18. Emotional demand HA	4.55	1.48	-0.51	-0.69	-.16**	.12**	.06	.06	-.12**	.10*	.07	.15**	.01	.01	.04	.03
19. Autonomy CA	5.53	0.91	-0.66	0.10	-.08	.05	.09*	.16**	-.07	.01	-.07	-.05	.03	.21**	.18**	.19**
20. Autonomy HA	2.92	1.45	0.64	-0.70	.07	-.06	.04	-.28**	.10*	.18**	.24**	.25**	.09	-.08	-.02	-.08
21. Colleague support CA	5.26	0.98	-0.75	0.67	-.02	.03	.08	.00	.04	.07	.01	.00	.07	.23**	.16**	.21**
22. Colleague support HA	3.24	1.49	0.41	-0.93	.00	-.06	.00	-.17**	.04	.17**	.18**	.25**	.04	-.11*	-.07	-.08
23. Supervisor support CA	5.35	0.95	-0.73	0.59	-.06	.04	.13**	.00	-.03	.02	-.04	-.07	.12**	.29**	.24**	.20**
24. Supervisor support HA	3.23	1.42	0.30	-0.94	-.02	-.03	.00	-.16**	-.01	.15**	.19**	.24**	.07	-.09*	-.07	-.12**
25. Feedback CA	5.38	0.95	-0.74	0.68	-.01	.04	.13**	.07	.05	.01	-.08	-.07	.14**	.24**	.23**	.25**
26. Feedback HA	3.11	1.44	0.49	-0.83	.01	-.07	.02	-.19**	.06	.18**	.25**	.25**	.07	-.09	-.08	-.12**
27. Burnout	3.66	1.19	0.01	-0.73	-.06	-.03	-.01	.05	-.06	.42**	.453**	.59**	-.35**	-.34**	-.42**	-.33**
28. Engagement	4.29	1.16	-0.23	-0.39	.02	-.04	.14**	-.20**	.07	-.14**	-.17**	-.29**	.39**	.37**	.48**	.35**

(continued)

Table 2 (continued)

Variable	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
13. Time urgency CA	(.87)															
14. Time urgency HA	-.43**	(.87)														
15. Role conflict CA	.60**	-.23**	(.85)													
16. Role conflict HA	-.25**	.53**	-.46**	(.88)												
17. Emotional demand CA	.56**	-.16**	.62**	-.22**	(.91)											
18. Emotional demand HA	-.22**	.48**	-.29**	.46**	-.51**	(.91)										
19. Autonomy CA	.02	.05	-.06	.08	-.07	.11*	(.77)									
20. Autonomy HA	.28**	.27**	.34**	.12**	.43**	.05	-.48**	(.91)								
21. Colleague support CA	.14**	.05	.04	.10*	-.02	.19**	.49**	-.19**	(.77)							
22. Colleague support HA	.21**	.31**	.31**	.12**	.40**	.06	-.26**	.70**	-.37**	(.91)						
23. Supervisor support CA	.10*	.06	-.01	.11**	-.05	.17**	.56**	-.32**	.66**	-.34**	(.76)					
24. Supervisor support HA	.24**	.26**	.28**	.12**	.38**	.06	-.34**	.72**	-.35**	.76**	-.46**	(.89)				
25. Feedback CA	.14**	.02	.04	.04	-.04	.21**	.51**	-.23**	.57**	-.25**	.56**	-.26**	(.77)			
26. Feedback HA	.22**	.30**	.29**	.15**	.39**	.06	-.355**	.77**	-.24**	.72**	-.29**	.72**	-.33**	(.91)		
27. Burnout	-.03	.20**	-.04	.23**	-.03	.13**	-.17**	.19**	-.18**	.24**	-.20**	.23**	-.23**	.24**	(.92)	
28. Engagement	.25**	-.04	.24**	-.12**	.27**	-.08	.13**	.17**	.20**	.06	.21**	.08	.25**	.12**	-.60**	(.93)

Note: CA = challenge appraisal; HA = hindrance appraisal. Reliability estimates (alpha) between brackets on the diagonal.

* $p < 0.05$. ** $p < 0.01$ level (two-tailed).

Hypotheses Testing

Appraisals of Job Demands and Well-being

We hypothesized that job demands are positively associated with burnout and negatively associated with engagement (Hypothesis 1). It shows that time urgency ($\beta = .42, p < .001$), role conflict ($\beta = .45, p < .001$), and emotional demands ($\beta = .59, p < .001$) were positively related to burnout. In contrast, time urgency ($\beta = -.20, p < .001$), role conflict ($\beta = -.23, p < .001$), and emotional demands ($\beta = -.32, p < .001$) were negatively associated with engagement. Hence, Hypothesis 1 was supported.

Then, we tested the moderating effects of appraisals on the relationship between various job demands and work engagement/burnout (Hypotheses 2-5). The interactions between challenge appraisals and time urgency ($\beta = .10, p < .05$), role conflict ($\beta = .13, p < .05$), and emotional demands ($\beta = .11, p < .05$), significantly predict work engagement. Follow-up tests showed that the adverse effects of job demands on engagement were weaker when challenge appraisals of job demands were high (time urgency, $b = -.09, p = .08$; role conflict, $b = -.09, p = .07$; emotional demands, $b = -.33, p < .001$) than when these appraisals were low (time urgency, $b = -.25, p < .001$; role conflict, $b = -.26, p < .001$; emotional demands, $b = -.63, p < .001$). We plotted the simple slope analysis for time urgency in Figure 1 (the plots for role conflict and emotional demands analyses are plotted in the supplementary file; the patterns are similar to those in Figure 1). Hence, Hypothesis 2 was supported.

Table 3. *Regression Results for the Moderation of Appraisals on the Relationships Between Job Demands and Work Engagement/Burnout in Study 1*

Predictors	Step 1		Step 2		Step 3	
	Burnout	Engagement	Burnout	Engagement	Burnout	Engagement
Work Time	.05	-.20***	-.01	-.13**	-.00	-.13**
Education	-.00	.13**	-.07	.13**	-.07	.13**
<i>Time Urgency</i>			.42***	-.20***	.42***	-.20***
Challenge Appraisals			-.02	.29***	-.04	.31***
Hindrance Appraisals			.14**	.10*	.15**	.09
Time Urgency × CA					-.07	.10*
Time Urgency × HA					.10*	-.07
<i>R</i> ²	.00	.06	.20	.14	.23	.16
Work Time	.05	-.20***	.03	-.16***	.03	-.15***
Education	-.00	.13**	-.04	.13**	-.05	.13**
<i>Role Conflict</i>			.45***	-.23***	.45***	-.22***
Challenge Appraisals			-.04	.26***	-.05	.27***
Hindrance Appraisals			.18***	.01	.19	-.00
Role Conflict × CA					-.03	.13**
Role Conflict × HA					-.05	.02
<i>R</i> ²	.002	.06	.25	.15	.25	.16
Work Time	.05	-.20***	.01	-.13	.00	-.12***
Education	.00	.13**	-.02	.11**	-.01	.11**
<i>Emotional Demands</i>			.59***	-.32***	.59***	-.32***
Challenge Appraisals			-.03	.32***	-.04	.33***
Hindrance Appraisals			.03	.13**	.05	.13**
Emotional Demands × CA					.01	.11*
Emotional Demands × HA					.12**	-.01
<i>R</i> ²	.00	.06	.35	.21	.37	.23

Note: * $p < .05$. ** $p < .01$. *** $p < .001$. CA = challenge appraisal; HA = hindrance appraisal. Standardized regression coefficients were reported.

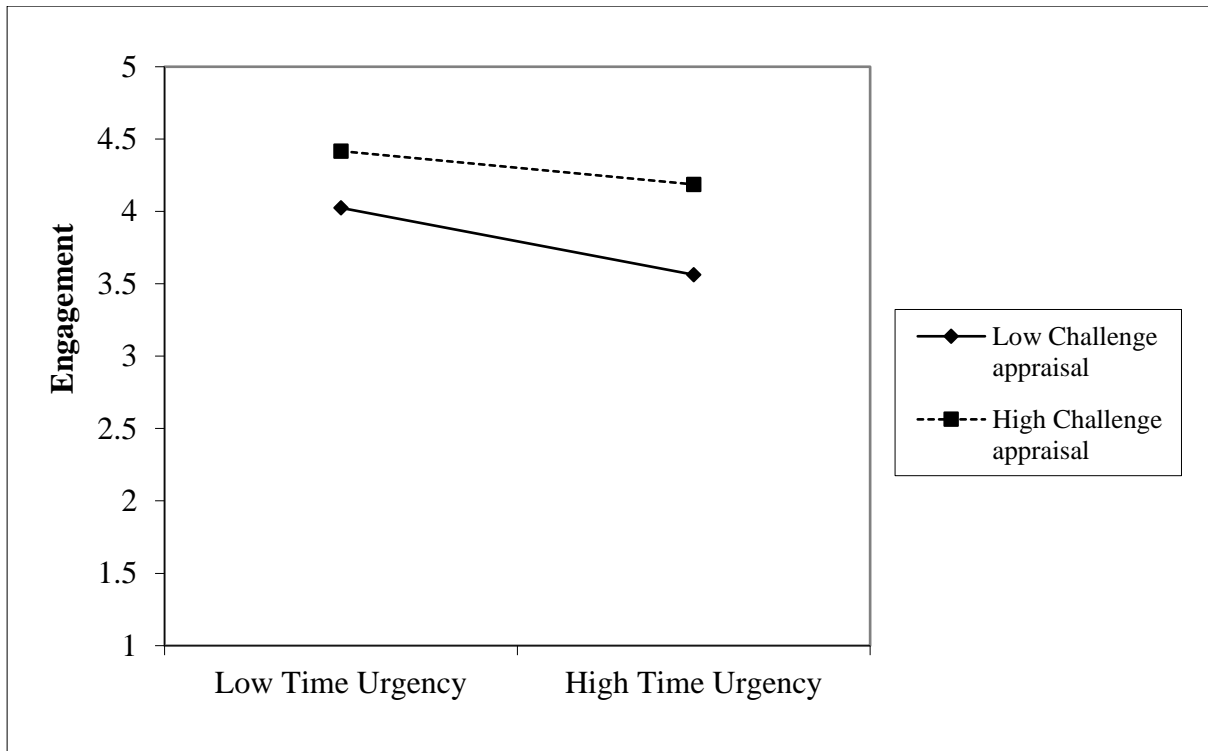


Figure 1. The Interaction Between Time Urgency and Challenge Appraisal on Engagement in Study 1

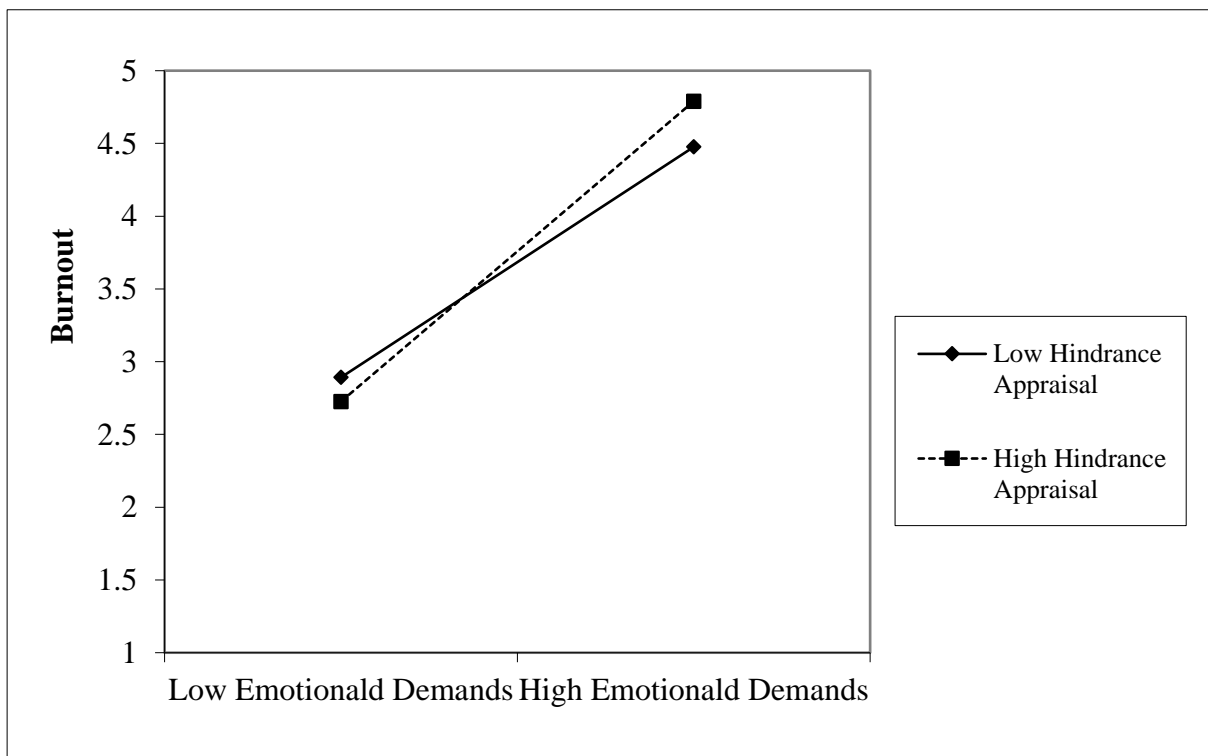


Figure 2. The Interaction Between Emotional Demands and Hindrance Appraisal on Burnout in Study 1

Contrary to our expectations, no significant moderation effects of challenge appraisal and job demands on burnout were found (Hypothesis 3 not supported). Similarly, the interaction effects between hindrance appraisal and job demands on engagement were not significant (Hypothesis 4 not supported). In addition, while the interaction between hindrance appraisal and role conflict failed to predict burnout ($\beta = -.05, p = .27$), the interactions of hindrance appraisal and time urgency ($\beta = .10, p < .05$) and emotional demands ($\beta = .12, p < .05$) predicted burnout. As expected, the simple slope test results showed that the regression coefficients of job demands on burnout were stronger when hindrance appraisal was high (time urgency, $b = .45, p < .001$; emotional demands, $b = 1.08, p < .001$) than when hindrance appraisal was low (time urgency, $b = .29, p < .001$; emotional demands, $b = .73, p < .001$; cf. Figure 2. For brevity, we only present the plot for emotional demands, the plot of time urgency, which is similar to Figure 2, is plotted in the supplementary file). Hence, Hypothesis 5 was partially supported.

Appraisals of Job Resources and Well-being

Hypothesis 6 stated that job resources will be positively associated with work engagement and negatively to burnout. As shown in Table 4, engagement was positively related to autonomy ($\beta = .34, p < .001$), supervisor support ($\beta = .42, p < .001$), colleague support ($\beta = .33, p < .001$), and feedback from others ($\beta = .31, p < .001$). Burnout was negatively associated with autonomy ($\beta = -.36, p < .001$), supervisor support ($\beta = -.41, p < .001$), colleague support ($\beta = -.30, p < .001$), and feedback from others ($\beta = -.28, p < .001$). These results supported Hypothesis 6.

Table 4. *Regression Results for the Moderation of Appraisals on the Relationships Between Job Resources and Work Engagement/Burnout in Study 1*

Predictors	Step 1		Step 2		Step 3	
	Burnout	Engagement	Burnout	Engagement	Burnout	Engagement
Work Time	.05	-.20***	.07	-.13**	.06	-.13**
Education	.00	.13***	.03	.07	.03	.07
Autonomy			-.36***	.34***	-.31***	.30***
Challenge Appraisals			-.07	.23***	-.07	.22***
Hindrance Appraisals			.20***	.21***	.13*	.28***
Autonomy × CA					-.05	.06
Autonomy × HA					.12*	-.10
<i>R</i> ²	.00	.06	.18	.24	.19	.25
Work Time	.05	-.20***	.03	-.12**	.04	-.12**
Education	.00	.13**	.02	.09*	.02	.09*
Supervisor Support			-.41***	.42***	-.37***	.40***
Challenge Appraisals			-.01	.18***	-.03	.18***
Hindrance Appraisals			.20***	.17***	.18***	.19***
Supervisor Support × CA					-.06	-.01
Supervisor Support × HA					.15**	-.15**
<i>R</i> ²	.00	.06	.22	.29	.26	.31
Work Time	.05	-.20***	.07	-.16***	.07	-.16***
Education	-.00	.13**	.01	.11**	.00	.11**
Colleague Support			-.30**	.33***	-.28***	.31***
Challenge Appraisals			-.04	.16***	-.04	.16***
Hindrance Appraisals			.21**	.13**	.21***	.13**
Colleague Support × CA					-.01	.04
Colleague Support × HA					.15**	-.12**
<i>R</i> ²	.00	.06	.16	.21	.19	.23
Work Time	.05	-.20***	.09*	-.17***	.10*	-.18***
Education	.00	.13**	.02	.08*	.02	.08*
Feedback			-.28***	.31***	-.24***	.28***
Challenge Appraisals			-.10*	.24***	-.12**	.25***
Hindrance Appraisals			.19***	.20***	.18***	.21***
Feedback × CA					-.08	.02
Feedback × HA					.16***	-.11**
<i>R</i> ²	.00	.06	.17	.24	.20	.25

Note: * $p < .05$. ** $p < .01$. *** $p < .001$. CA = challenge appraisal; HA = hindrance appraisal. Standardized regression coefficients were reported.

Next, we tested the moderating effects of appraisals on the relationship between job resources and work engagement/burnout (Hypotheses 7-10). Unexpectedly, no significant moderation effects of *challenge* appraisals and job resources on burnout and engagement were found (Hypotheses 7-8 not supported). Conversely, the interactions of *hindrance* appraisals and autonomy ($\beta = -.10, p = .06$), supervisor support ($\beta = -.15, p < .001$), colleague support ($\beta = -.12, p < .05$), and feedback from others ($\beta = -.11, p < .05$) predicted work engagement. Follow-up simple slope tests (Figure 3) showed that when hindrance appraisal was high (autonomy, $b = .16, p < .01$; supervisor support, $b = .41, p < .001$; colleague support, $b = .31, p < .01$; feedback from others, $b = .26, p < .01$), the positive relations between engagement and these resources were weaker than when hindrance appraisal was low (autonomy, $b = .31, p < .001$; supervisor support, $b = .84, p < .001$; colleague support, $b = .70, p < .001$; feedback from others, $b = .58, t = 7.34, p < .001$). Thus, Hypothesis 9 was supported.

Lastly, the interactions of hindrance appraisals and autonomy ($\beta = .12, p < .05$), supervisor support ($\beta = .15, p < .001$), colleague support ($\beta = .15, p < .001$), and feedback from others ($\beta = .16, p < .001$) predicted burnout, such that when hindrance appraisal was high, the negative effect of job resources on burnout was weaker. Follow-up simple slope tests showed that the regression coefficients of job resources on burnout were weaker when hindrance appraisal was high (autonomy, $b = -.17, p < .05$; supervisor support, $b = -.35, p < .001$; colleague support, $b = -.22, p < .05$; feedback from others, $b = -.14, p = .15$) than when hindrance appraisal was low (autonomy, $b = -.34, p < .001$; supervisor support, $b = -.81, p < .001$; colleague support, $b = -.72, p < .001$; feedback from others, $b = -.60, p < .001$; see Figure 3. We only plotted the simple slope analysis results for supervisor support; the other moderation patterns are similar to Figure 3 and are plotted in the supplementary file). Therefore, Hypothesis 10 was supported.

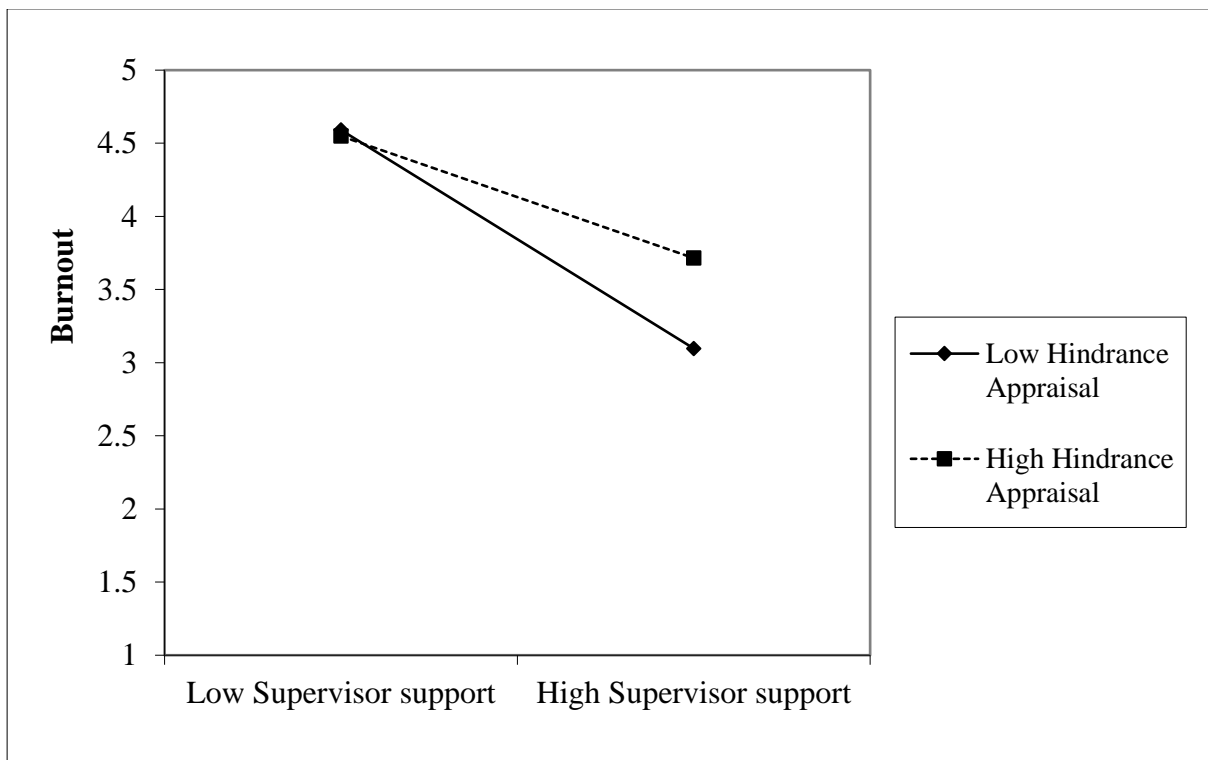
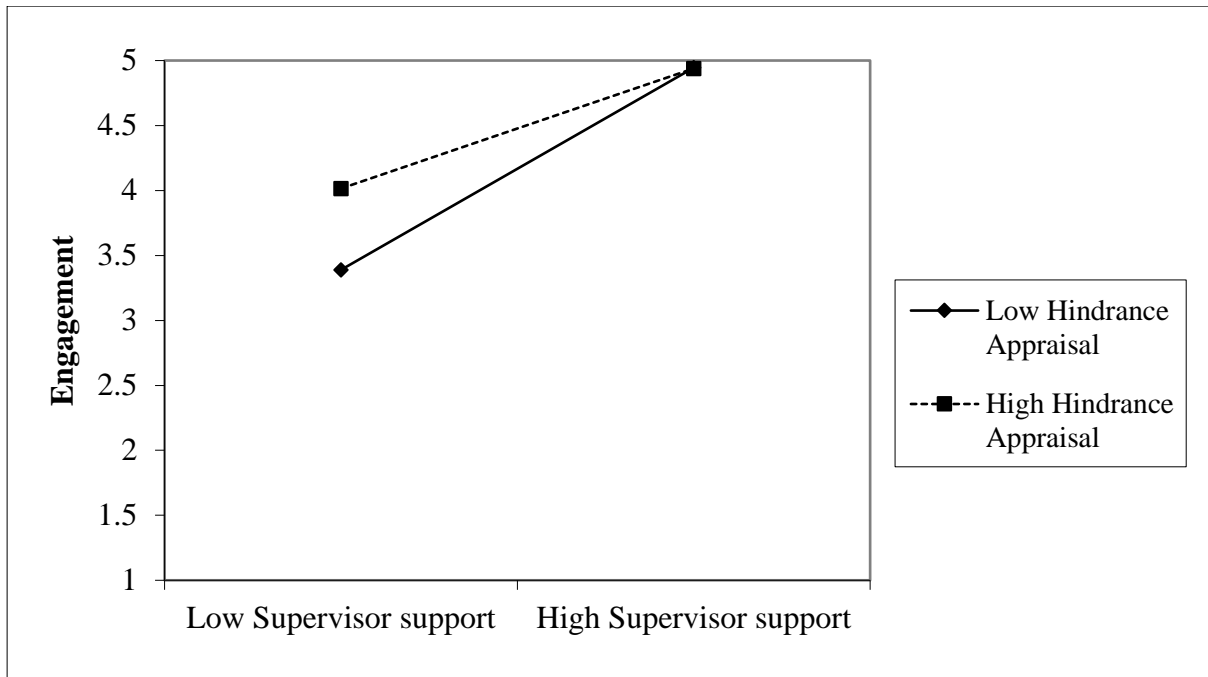


Figure 3. The Interactions Between Supervisor Support and Hindrance Appraisal on Engagement (top) and Burnout (bottom) in Study 1

Summary of Study 1 Findings

The results of Study 1 reveal that job characteristics that are usually categorized as “demands” (i.e., time urgency, role conflict, and emotional demands) or “resources” (i.e., autonomy, social support from supervisors and colleagues, and feedback from others) can be appraised as both challenging and hindering. Further, the moderation analysis showed 12 significant interaction effects between job characteristics and appraisals. Specifically, our results indicate that individuals appraisals of job characteristics matter: a positive interpretation (challenge appraisal) of job demands will buffer its detrimental effect on work engagement such that when challenge appraisal was high, the negative relationship between job demands and engagement became weaker; whereas a negative interpretation of job demands (time urgency and emotional demands) will strengthen its detrimental effects on burnout. In addition, a negative interpretation (hindrance appraisal) of job resources will undermine its beneficial effects such that when hindrance appraisal was high, the positive/negative relationship between job resources and work engagement/burnout became weaker.

The study provided preliminary support for our hypotheses. However, there are several limitations to Study 1. First, we measured employees’ appraisal in scenarios, which might be inferior to assessing their appraisals of actual job characteristics. Second, we collected data from a multi-occupation sample, which implies that there may have been subtle differences in the job characteristics of the participants. For example, for technology employees, the meaning of emotional demands may be different from for nurses (Bakker & Sanz-Vergel, 2013). Third, we collected data using an online panel. Although there are some important advantages to such an approach (Porter et al., 2018), participants’ experiences of participating in many different surveys might have impacted their answers due to a practice effect (i.e., an improvement in performance on a task due to repetition) or a fatigue effect (i.e., a decrease in performance of a task due to boredom or tiredness; Wesnes, & Pincock, 2002).

Finally, due to the cross-sectional nature of the data (Podsakoff et al., 2003), we were unable to make causal conclusions about the relationships among the variables.

Study 2 Method

To address these limitations, we collected data from a group of nurses working in a single hospital in China to provide an additional test of the hypotheses stated in Study 1. By doing so, we aim to increase the generalizability of our findings since this is a homogenous rather than a heterogeneous sample from multiple organizations. This follow-up study used a different approach for measuring appraisals (i.e., referring to employees' current job characteristics instead of referring to a scenario). In this vein, Study 2 aims to both cross-validate and extend the findings obtained in Study 1.

Sample and Procedure

We collected data from different departments within a Chinese hospital. We sent 400 online questionnaires, 316 of which were returned (a response rate of 79%). Participants were predominantly female (61.4%), and were on average 31.4 years old. They had been employed in their current organization for on average 6.33 years. Informed consent was obtained and participants were ensured anonymity. As a reward, participants received 15 RMB (about €2) for their participation.

Measures

We measured *time urgency*, *emotional demands*, *autonomy*, *colleague support*, *work engagement*, and *burnout* with the same items as in Study 1. With regards to *appraisal*, we instructed participants to appraise their own job characteristics. As an example, when measuring emotional demands, we asked "Think about the amount of emotional demands you are experiencing in the last two weeks in your work. Could you please indicate how you

would consider the emotional demands in your job? I believe that the emotional demands in my job ...” For the measurement of challenge and hindrance appraisals, we used the same eight items as in Study 1. Table 6 shows the Cronbach’s alphas of these scales (ranged between .71 to .94), demonstrating adequate reliability.

Study 2 Results

Measurement Model

Table 5 shows that fit indices of the hypothesized 23-factor model had reasonable fit indexes ($\chi^2_{(3232)} = 6,288.12, p < .001$; RMSEA = .05; CFI = .87; TLI = .85; SRMR = .05) and fit the data better than five alternative models (see Table 5). In addition, we tested a model where an additional unmeasured latent method factor was included. The results showed that the common method factor explained 5.3% of the variance, indicating that the method effects were not severe.

Table 5. *Results of Confirmatory Factor Analyses in Study 2*

Model	Chi-Square	df	RMSEA [90% CI]	CFI	TLI	SRMR	AIC	BIC
23-factor parceled	6288.12	3316	.05[.051, .055]	.87	.85	.05	70840.61	72759.80
23-factor not parceled	8297.52	4499	.05[.05, .053]	.86	.84	.05	82427.79	84493.45
26 factor	8134.40	4427	.05[.05, .053]	.86	.85	.05	82408.66	84744.73
11-factor	12367.98	3514	.09[.088, .091]	.60	.59	.12	76524.48	77700.02
13-factor	9051.57	3491	.07[.069, .073]	.75	.74	.07	73254.06	74516.00
8-factor	10455.34	3541	.08[.077, .080]	.69	.68	.08	74557.84	75631.98
23-factor parceled with common method effects	6268.23	3315	.05[.051, .055]	.87	.85	.05	70822.73	72745.67
1-factor	19441.43	3569	.12[.117, .120]	.29	.27	.15	83487.93	84456.91

Note. RMSEA = root mean square error of approximation, CFI = comparative fit index, TLI = Tucker–Lewis index, SRMR = standardized root mean residual. CI = Confidence interval, AIC = Akaike information criterion, BIC = Bayesian information criterion.

23-factor model-parceled: 3 demands: time urgency, role conflict, and emotional demands; 4 resources: autonomy, feedback, colleague support, and supervisor support; 7 challenge and 7 hindrance appraisals of demands and resources: and 2 outcomes with 9 engagement items were mean-parceled as three indicators based on the three engagement dimensions and loading on one latent engagement factor; 9 burnout items were mean-parceled as two indicators representing exhaustion and cynicism, and loading on one latent burnout factor);

23-factor not parceled: 23-factor model-parceled with 9 items of engagement loaded on one, and 9 items of burnout loaded on another latent factor

26-factor: 23-factor not parceled with 2 outcomes loaded as 5 factors: vigor, dedication, absorption, exhaustion and cynicism

11-factor: 23-factor model-parceled with seven challenge appraisals into one, and seven hindrance appraisals loaded on one factor

13-factor: 11-factor splitting appraisals as 4 factors: challenge/hindrance appraisals of demands and challenge/hindrance appraisals of resources

8-factor: 11-factor combining three demands into one factor, and four resources into another factor

23-factor parceled with common method effects: 23-factor model-parceled added a latent method factor allowing all items loaded on the method factor

1-factor model: with all variables loaded onto one factor.

Challenge and Hindrance Ratings of Job Characteristics

Table 6 presents the means, standard deviations, internal consistency reliabilities, and zero-order correlations for the manifest scale scores. This table shows that time urgency was considered to be more of a challenge ($M = 5.07, SD = 1.05$) than of a hindrance ($M = 3.68, SD = 1.16; T = 12.73, p < .001$). Similarly, role conflict ($M_{\text{challenge}} = 4.57, SD = 1.27; M_{\text{hindrance}} = 4.11, SD = 1.35; T = 3.50, p < .001$) and emotional demands ($M_{\text{challenge}} = 4.63, SD = 1.30; M_{\text{hindrance}} = 3.91, SD = 1.40; T = 5.47, p < .001$) were more often perceived as challenges than as hindrances. As for job resources, the results in Table 6 show that autonomy was more considered a challenge ($M = 5.50, SD = 0.83$) than a hindrance ($M = 2.96, SD = 1.25; T = 25.68, p < .001$). Similar results were found for supervisor support ($M_{\text{challenge}} = 5.43, SD = 0.90; M_{\text{hindrance}} = 2.85, SD = 1.21; T = 25.72, p < .001$), feedback from others ($M_{\text{challenge}} = 5.46, SD = 0.83; M_{\text{hindrance}} = 2.80, SD = 1.17; T = 27.76, p < .001$), and colleague support ($M_{\text{challenge}} = 5.37, SD = 0.86; M_{\text{hindrance}} = 2.88, SD = 1.19; T = 27.11, p < .001$). Since the SD s for these appraisal ratings do not equal zero, this demonstrates that employees may differ quite strongly in their appraisals of these job characteristics. These findings also show that job characteristics can be both appraised as challenges and hindrances, but in general more as a challenge than as a hindrance (see Table 6).

Table 6. Means, Standard Deviations, and Correlations Among the Study Variables in Study 2

Variable	Mean	SD	Skewness	Kurtosis	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	31.40	7.27	1.36	2.18	1.											
2. Gender	1.61	0.49	-0.47	-1.79	-.19**	1.										
3. Education	3.98	0.59	-0.66	2.77	-.15**	.05	1.									
4. Work time	42.18	15.28	-0.51	1.78	-.03	-.11	.04	1.								
5. Tenure	6.33	5.32	1.69	3.15	.77**	-.10	-.20**	-.10	1.							
6. Time urgency	4.27	1.25	-0.35	-0.59	-.02	.00	.09	.02	-.06	(.91)						
7. Role conflict	4.16	1.37	-0.22	-0.80	-.13*	-.07	.02	-.02	-.14*	.49**	(.86)					
8. Emotional demand	2.80	0.94	0.11	-0.68	-.09	.14*	.03	.01	-.10	.54**	.48**	(.82)				
9. Autonomy	4.45	1.40	-0.27	-0.81	.16**	.03	-.04	-.11*	.14*	-.32**	-.41**	-.26**	(.92)			
10. Colleague support	3.47	0.71	-0.55	0.30	.10	-.02	-.01	-.05	.11*	-.28**	-.21**	-.29**	.39**	(.71)		
11. Supervisor support	3.20	0.84	-0.29	-0.40	.15**	-.03	-.02	-.13*	.16**	-.24**	-.26**	-.25**	.44**	.68**	(.78)	
12. Feedback	3.54	0.87	-0.82	0.44	.11	-.03	.09	-.08	.09	-.08	-.14*	-.13*	.20**	.45**	.53**	(.79)
13. Time urgency CA	5.07	1.05	-0.85	0.85	.13*	-.02	.04	-.13*	.11	-.13*	-.19**	-.27**	.42**	.51**	.50**	.36**
14. Time urgency HA	3.68	1.16	0.14	-0.24	-.03	.03	.08	.04	-.05	.40**	.40**	.46**	-.35**	-.39**	-.37**	-.21**
15. Role conflict CA	4.57	1.27	-0.47	-0.23	.15**	.09	-.02	-.12*	.11*	.00	-.03	-.03	.30**	.38**	.41**	.31**
16. Role conflict HA	4.11	1.35	-0.24	-0.57	-.06	-.02	.09	.03	-.05	.22**	.24**	.27**	-.24**	-.28**	-.32**	-.18**
17. Emotional demand CA	4.63	1.30	-0.49	-0.29	.12*	.03	.00	-.11*	.08	-.06	-.09	-.14*	.34**	.43**	.49**	.30**
18. Emotional demand HA	3.91	1.40	0.01	-0.86	-.01	.00	.12*	.01	-.04	.27**	.27**	.29**	-.21**	-.20**	-.26**	-.13*
19. Autonomy CA	5.50	0.83	-0.88	2.03	.02	.00	-.01	-.11*	.05	-.11*	-.15**	-.09	.27**	.30**	.26**	.13*
20. Autonomy HA	2.96	1.25	0.69	0.09	.02	.01	.06	-.09	-.02	.30**	.38**	.27**	-.17**	-.11*	-.06	-.01
21. Colleague support CA	5.37	0.86	-0.65	2.29	-.03	.02	-.03	-.05	-.02	-.15**	-.14*	-.18**	.23**	.38**	.30**	.19**
22. Colleague support HA	2.88	1.19	0.80	0.54	.08	-.04	.03	-.07	.03	.20**	.22**	.18**	-.04	-.02	.08	.02
23. Supervisor support CA	5.43	0.90	-0.99	2.64	-.01	-.04	.07	-.10	-.02	-.13*	-.12*	-.21**	.28**	.32**	.35**	.25**
24. Supervisor support HA	2.85	1.21	0.92	0.58	.08	.02	.02	-.09	.00	.29**	.25**	.23**	-.06	-.06	-.05	-.01
25. Feedback CA	5.46	0.83	-0.90	3.10	-.04	.00	.00	.00	.00	-.08	-.13*	-.09	.26**	.30**	.24**	.20**
26. Feedback HA	2.80	1.17	0.88	0.74	.10	.00	.05	-.12*	.03	.26**	.27**	.20**	-.11*	-.11*	-.02	.02
27. Burnout	2.50	1.15	0.35	0.02	-.16**	.08	.02	.02	-.15**	.49**	.48**	.62**	-.42**	-.44**	-.44**	-.30**
28. Engagement	3.20	1.12	0.05	-0.46	.22**	-.05	.04	.00	.17**	-.27**	-.27**	-.43**	.43**	.50**	.49**	.38**

(continued)

Table 6 (continued)

Variable	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
13. Time urgency CA	(.85)															
14. Time urgency HA	-.55**	(.85)														
15. Role conflict CA	.62**	-.28**	(.89)													
16. Role conflict HA	-.37**	.57**	-.58**	(.91)												
17. Emotional demand CA	.68**	-.42**	.72**	-.47**	(.90)											
18. Emotional demand HA	-.28**	.64**	-.31**	.71**	-.53**	(.92)										
19. Autonomy CA	.45**	-.17**	.25**	-.04	.30**	-.03	(.82)									
20. Autonomy HA	-.08	.38**	.09	.28**	.02	.32**	-.40**	(.93)								
21. Colleague support CA	.49**	-.25**	.35**	-.20**	.38**	-.09	.62**	-.25**	(.83)							
22. Colleague support HA	-.04	.31**	.12*	.28**	.12*	.31**	-.29**	.62**	-.25**	(.91)						
23. Supervisor support CA	.54**	-.32**	.35**	-.22**	.36**	-.16**	.58**	-.25**	.72**	-.27**	(.86)					
24. Supervisor support HA	-.09	.33**	.11	.25**	.10	.30**	-.27**	.67**	-.27**	.74**	-.42**	(.92)				
25. Feedback CA	.48**	-.25**	.37**	-.17**	.37**	-.10	.61**	-.26**	.71**	-.21**	.65**	-.23**	(.83)			
26. Feedback HA	-.10	.34**	.07	.26**	.03	.28**	-.35**	.65**	-.34**	.71**	-.30**	.73**	-.44**	(.92)		
27. Burnout	-.42**	.53**	-.24**	.36**	-.34**	.38**	-.27**	.29**	-.36**	.21**	-.35**	.29**	-.33**	.30**	(.94)	
28. Engagement	.56**	-.51**	.34**	-.30**	.47**	-.31**	.32**	-.18**	.41**	-.09	.41**	-.16**	.37**	-.15**	-.75**	(.94)

Note. CA = challenge appraisal; HA = hindrance appraisal. Reliability estimates (alpha) between brackets on the diagonal.

* $p < 0.05$. ** $p < 0.01$ level (two-tailed).

Hypotheses Testing

Hypothesis 1 postulated that job demands are positively associated with burnout and negatively associated with engagement. The results show that time urgency ($\beta = .35, p < .001$), role conflict ($\beta = .43, p < .001$), and emotional demands ($\beta = .56, p < .001$) were positively related to burnout. In contrast, time urgency ($\beta = -.13, p < .01$), role conflict ($\beta = -.24, p < .001$), and emotional demands ($\beta = -.38, p < .001$) were negatively associated with engagement, which supported Hypothesis 1 again (see Table 7).

Then, we tested the interaction effects between various job demands and appraisals on work engagement/burnout (Hypotheses 2-5). The results show that the interactions between challenge appraisals and time urgency ($\beta = -.13, p < .05$), role conflict ($\beta = -.102, p = .08$), and emotional demands ($\beta = -.12, p < .05$) significantly predicted burnout. We plotted the simple slopes for time urgency in Figure 4 (the interaction pattern for emotional demands was similar to time urgency and the interaction figure is provided in the supplementary figure). The detrimental effect of time urgency on burnout was weaker when challenge appraisal was high, which partially supported Hypothesis 3. No other interactions were found between job demands and appraisals on the outcomes. Hence, Hypotheses 2, 4, and 5 were not supported.

Table 7. *Regression Results for the Moderation of Appraisals on the Relationships Between Job Demands and Work Engagement/Burnout in Study 2*

Predictors	Step 1		Step 2		Step3	
	Burnout	Engagement	Burnout	Engagement	Burnout	Engagement
Work Time	.02	-.00	-.03	.06	-.03	.064
Education	.020	.04	-.02	.06	-.02	.06
<i>Time Urgency</i>			.35***	-.13**	.35***	-.12*
Challenge Appraisals			-.23***	.42***	-.22***	.41***
Hindrance Appraisals			.26***	-.24***	.27***	-.25***
Time Urgency × CA					-.13*	.04
Time Urgency × HA					-.04	.08
<i>R</i> ²	.00	.00	.41	.40	.42	.40
Work Time	.02	-.00	.01	.03	.01	.03
Education	.02	.04	-.01	.06	-.00	.05
<i>Role Conflict</i>			.43***	-.24***	.43***	-.24***
Challenge Appraisals			-.11	.30***	-.10	.29***
Hindrance Appraisals			.19**	-.08	.21**	-.09
Role Conflict × CA					-.10	.09
Role Conflict × HA					-.00	-.01
<i>R</i> ²	.00	.00	.30	.19	.31	.20
Work Time	.02	-.00	-.01	.05	-.01	.05
Education	.02	.04	-.01	.05	-.01	.04
<i>Emotional Demands</i>			.56***	-.38***	.54***	-.36***
Challenge Appraisals			-.21***	.44***	-.19***	.42***
Hindrance Appraisals			.11*	.02	.13*	.01***
Emotional Demands × CA					-.12*	.10
Emotional Demands × HA					-.04	.02
<i>R</i> ²	.00	.00	.46	.36	.47	.37

Note: CA = challenge appraisal; HA = hindrance appraisal. Standardized regression coefficients were reported. * $p < .05$. ** $p < .01$. *** $p < .001$.

Hypothesis 6 stated that job resources will be positively associated with work engagement and negatively with burnout. Table 8 shows that autonomy ($\beta = .38, p < .001$), supervisor support ($\beta = .40, p < .001$), colleague support ($\beta = .41, p < .001$), and feedback from others ($\beta = .32, p < .001$) was positively related to engagement. Autonomy ($\beta = -.36, p < .001$), supervisor support ($\beta = -.38, p < .001$), colleague support ($\beta = -.36, p < .001$), and feedback from others ($\beta = -.27, p < .001$) were negatively associated with burnout. These results supported Hypothesis 6.

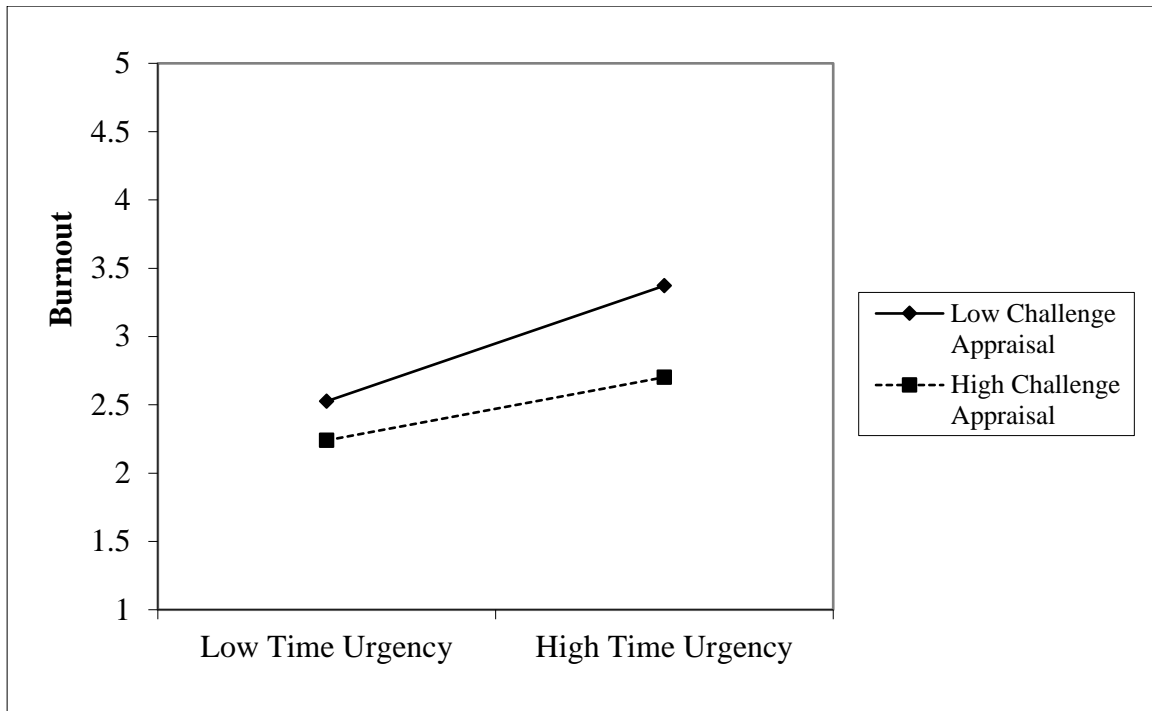


Figure 4. The Interaction Between Time Urgency and Challenge Appraisal on Burnout in Study 2

Finally, we tested the moderating effects of appraisals on the relationship between various job resources and work engagement/burnout (Hypotheses 7-10). The results show that the interactions between challenge appraisal and autonomy ($\beta = .13, p < .05$), supervisor support ($\beta = .15, p < .01$), colleague support ($\beta = .11, p < .05$), and feedback ($\beta = .19, p < .01$) significantly predicted employee engagement. Specifically, the positive relationship between these job characteristics and work engagement was more positive when challenge appraisal was high (see Figure 5 for feedback; other interaction effects are similar to feedback and are plotted in the supplementary file), which supported Hypothesis 7. The interactions between challenge appraisal and job resources on burnout was significant only for feedback ($\beta = -.22, p < .001$). The negative relationship between feedback and burnout was stronger when challenge appraisal was high (see Figure 5). Therefore, Hypothesis 8 was partially

supported. Unexpectedly, no significant moderation effects of *hindrance* appraisals and job resources on burnout and engagement were found (Hypotheses 9-10 not supported).

Table 8. *Regression Results for the Moderation of Appraisals on the Relationships Between Job Resources and Work Engagement/Burnout in Study 2*

Predictors	Step 1		Step 2		Step 3	
	Burnout	Engagement	Burnout	Engagement	Burnout	Engagement
Work Time	.02	-.00	-.01	.06	-.01	.06
Education	.02	.04	-.01	.06	-.01	.06
<i>Autonomy</i>			-.36***	.38***	-.36***	.36***
Challenge Appraisals			-.10	.21***	-.09	.23***
Hindrance Appraisals			.19**	-.03	.19**	-.04
Autonomy × CA					.02	.13*
Autonomy × HA					-.00	.07
<i>R</i> ²	.00	.00	.23	.24	.23	.25
Work Time	.02	-.00	-.02	.07	-.02	.07
Education	.02	.04	.02	.03	.01	.06
<i>Supervisor Support</i>			-.38***	.40***	-.37***	.39***
Challenge Appraisals			-.14*	.26***	-.15*	.29***
Hindrance Appraisals			.21***	-.02	.21***	-.03
Supervisor Support × CA					-.05	.15**
Supervisor Support × HA					.02	.04
<i>R</i> ²	.00	.00	.28	.31	.28	.33
Work Time	.02	-.00	.00	.03	-.01	.04
Education	.02	.04	.01	.05	.00	.06
<i>Colleague Support</i>			-.36***	.41***	-.36***	.39***
Challenge Appraisals			-.19**	.26***	-.20***	.29***
Hindrance Appraisals			.15**	-.01	.14**	-.01
Colleague Support × CA					-.03	.11*
Colleague Support × HA					.03	.01
<i>R</i> ²	.00	.00	.26	.31	.26	.32
Work Time	.02	-.00	.02	.02	.01	.03
Education	.02	.04	.03	.02	.01	.03
<i>Feedback</i>			-.27***	.32***	-.26***	.31***
Challenge Appraisals			-.17**	.30***	-.13*	.26***
Hindrance Appraisals			.23***	-.03	.25***	-.06
Feedback × CA					-.22***	.19**
Feedback × HA					-.04	.09
<i>R</i> ²	.00	.00	.21	.24	.25	.26

Note: * $p < .05$. ** $p < .01$. *** $p < .001$. CA = challenge appraisal; HA = hindrance appraisal. Standardized regression coefficients were reported.

Control variables

We also tested our hypotheses by including social demographics (i.e., age, gender, education, tenure, and work time) as control variables and the pattern of results did not change, supporting the robustness of the findings.

Summary of Study 2

In study 2, we used a homogeneous sample to replicate our findings in Study 1. The results in Study 2 supported our argument that job characteristics can be appraised simultaneously as challenges and hindrances, and that such appraisals moderate some of the job characteristics – employee well-being relationships. The moderation results showed that a positive interpretation of job demands (time urgency and emotional demands) mitigates its detrimental effect on burnout. In particular, when challenge appraisal of job demands is high, the negative relationship between job demands and burnout became weaker (partially supported Hypothesis 3). In addition, a positive interpretation of job resources (autonomy, supervisor support, colleague support, and feedback) will strengthen its benefit on employee work engagement and burnout (only for feedback). When challenge appraisal of job resources is high, the positive/negative relationship between job resources and work engagement/burnout became stronger (fully supported Hypothesis 7 and partially supported Hypothesis 8). But other hypothesized interaction effects between job characteristics and appraisals on employee well-being were not found (Hypotheses 2, 4, 5, 9, and 10 were not supported). Therefore, the moderation hypotheses were partially supported across the two studies with different samples and study designs (i.e., measurement of appraisals), and the significant relationships across the two studies are in line with the directions of the links predicted in our hypotheses. Note that in Study 2, the sample sizes were relatively small compared to Study 1, and the

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model fit indices of CFI and TLI for CFA were lower than suggested (above .95; Hu & Bentler, 1999). This should be considered as a limitation.

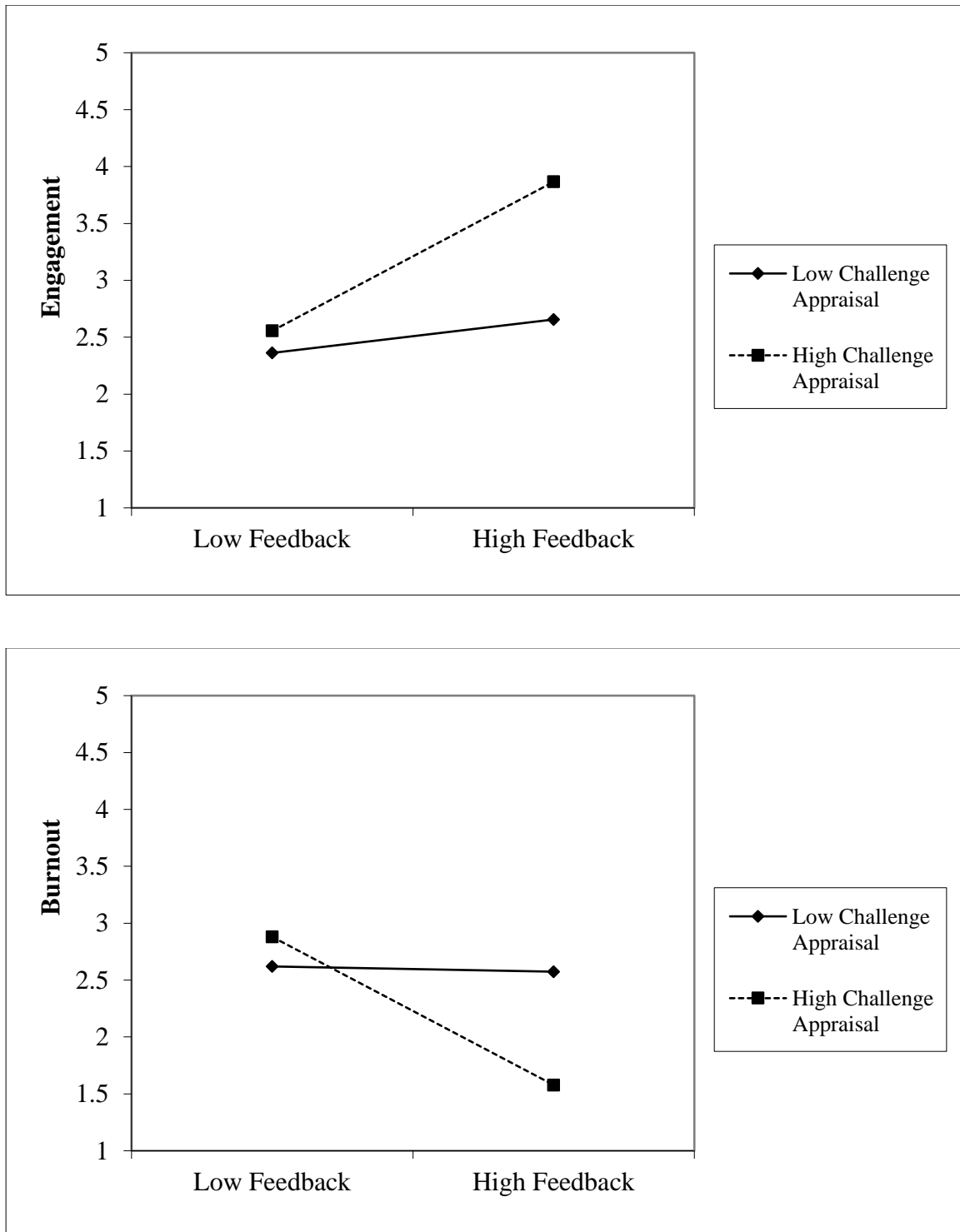


Figure 5. The Interactions Between Feedback and Challenge Appraisal on Engagement (top) and Burnout (bottom) in Study 2

Overall Discussion

This study focused on the appraisals of job characteristics as challenges and/or hindrances, and examined how these job characteristics and their appraisals interacted to affect employee well-being across two studies involving 514 employees from multiple organizations and a sample of 314 nurses from a single hospital, respectively. Overall, our results supported the notion that the appraisals of job characteristics as challenges and hindrances are not mutually exclusive. The job characteristics that are normally categorized as job demands and job resources could be appraised as challenges and hindrances simultaneously.

In addition, the appraisals of job demands and resources could moderate some of the relationships between demands/resources and well-being in terms of employee engagement and burnout. Specifically, the more an employee perceives a certain job demand (i.e., time urgency, role conflict, or emotional demand) to be challenging, the weaker the relationship between this job demand and employee engagement/burnout. Further, the more the employee perceives a certain job resource to be challenging, the stronger the relationship between this resource and employee engagement/burnout. Conversely, if an employee perceives a basically favorable situation (i.e., autonomy, supervisor and colleague support, and feedback) more as a hindrance, the positive relationships between job resources and engagement and the negative relationships between resources and burnout are weaker. The findings of the current study suggest that job characteristics have a particular basic valence (i.e., that of a job demand vs a job resource, cf. Demerouti et al., 2001; or that of a challenge vs a hindrance, cf. LePine et al., 2016), and that individual appraisal of these characteristics plays an essential role in the effects of these characteristics on employee well-being. In particular, the appraisals that are incongruent with the basic valence of a job characteristic yields a more salient impact on employee well-being (i.e., appraising job demands as challenging, or appraising job resources as hindering), as shown in the present study. Although the results across the two studies were

not exactly the same (for a comparison of these two studies, see Table 9), the overall interaction patterns obtained in both studies are in line with our hypotheses. These inconsistent findings might have occurred for two possible empirical reasons. The first relates to the different sampling methods. Study 1 used employees from multiple organizations, whereas Study 2 used employees in a single hospital. Bakker and Sanz-Vergel (2013) found that emotional demands were appraised as challenges by nurses, and they suggested that whether job demands act as a challenge or a hindrance varies across occupations and individuals. Alternatively, the differences between both studies might be because of different measurements. As aforementioned, in Study 2 we asked employees to appraise their *current* job characteristics, whereas Study 1 measured employees' *general* appraisals.

Table 9. *A comparison of the Interaction Effect Between Job Characteristics and Appraisals Among Two Studies*

Hypotheses	Hypothesized Relationships	Study 1	Study 2
Direct effect	H1: time urgency, role conflict and emotional demands will be positively related to burnout and negatively to engagement	yes 6/6	yes 6/6
Demands* CA ON Engagement	H2: the negative relation between demands and engagement is weaker when challenge appraisal is high	yes 3/3	no 0/3
Demands* CA ON Burnout	H3: the positive relation between demands and burnout is weaker when challenge appraisal is high	no 0/3	partial 2/3
Demands* HA ON Engagement	H4: the negative relation between demands and engagement is stronger when hindrance appraisal is high	no 0/3	no 0/3
Demands* HA ON Burnout	H5: the positive relation between demands and burnout is stronger when hindrance appraisal is high	partial 2/3	no 0/3
Direct effect	H6: job resources will be positively related to work engagement and negatively to burnout	yes 8/8	yes 8/8
Resources* CA ON Engagement	H7: the positive relation between resources and engagement is stronger when challenge appraisal is high	no 0/4	yes 4/4
Resources* CA ON Burnout	H8: the negative relation between resources and burnout is stronger when challenge appraisal is high	no 0/4	partial 1/4
Resources* HA ON Engagement	H9: the positive relation between resources and engagement is weaker when hindrance appraisal is high	partial 3/4	no 0/4
Resources* HA ON Burnout	H10: the negative relation between resources and burnout is weaker when hindrance appraisal is high	yes 4/4	no 0/4

Note: CA = challenge appraisal; HA = hindrance appraisal; Demands include time urgency, role conflict, and emotional demands; Resources include autonomy, supervisor support, colleague support, and feedback

Theoretical Implications

Our study has several theoretical implications. First, this study contributes to the literature on job characteristics theory (e.g., the JD-C model, Karasek, 1979; the JD-R model, Demerouti et al., 2001) and the Challenge-Hindrance Stressor Framework (Cavanaugh et al., 2000) by showing how individuals could appraise the job characteristics differentially. Previous research often has a-priori classified job characteristics as either demands or resources (or as challenges vs. hindrances), while ignoring the role of employees' subjective appraisals of these characteristics (González-Morales & Neves, 2015; Ohly, & Fritz, 2010; Parker, 2014; Webster et al., 2011, for notable exceptions). Our results did not find any presumed positive effects for a-priori "challenge stressors" on employee outcomes (e.g., time pressure), which is in line with a recent meta-analysis (Mazzola & Disselhorst, 2019); and empirical studies also showed that time pressure is negatively related to work engagement (e.g., Baethge et al., 2019; Gabriel et al., 2019; Kronenwett & Rigotti, 2019). This suggests that the challenge-hindrance stressor model may not be as effective in all contexts as some researchers suggested (e.g., O'Brien & Beehr, 2019). Our study drew upon appraisal theory (Lazarus & Folkman, 1984) and tested empirically whether job characteristics (i.e., normally called "job demands and job resources") can be simultaneously appraised as challenges and hindrances. We demonstrated that specific job characteristics can be appraised as being both a challenge *and* a hindrance simultaneously. Specifically, Study 1 found among three selected job demands, time urgency was primarily appraised as a challenge, and was to some degree also appraised as a hindrance; role conflict and emotional demands were more likely to be appraised as hindrances, and to some extent as challenges. In Study 2, these job demands were more likely appraised as challenges by nurses and to some degree as hindrances. These results are largely consistent with Webster et al. (2011), who reported that job demands (e.g., workload, role ambiguity) can simultaneously be perceived as challenges and hindrances to varying degrees.

Our findings add to previous studies (e.g., LePine et al., 2005) by suggesting that job demands may not simply be a-priori categorized as challenges or hindrances. Interestingly, across two studies, we found that time urgency was more likely to be considered as a challenge than a hindrance (similar to role conflict and emotional demands in Study 2); however, it demonstrated a negative effect on work engagement. We argue that when job demands unfold their challenging potential on employee well-being may depend on some boundary conditions. This is consistent with the findings by Kronenwett and Rigotti (2019) who found that time pressure and emotional demands had positive indirect effects on work engagement through task-related achievement when unnecessary tasks are less frequent. Similarly, Baethge et al. (2019) found that time pressure positively related to work engagement only when employees do not work longer. Taken together, our results resonate with these previous research findings by suggesting that whether job demands have challenging or hindering effects may depend on some boundary conditions.

Moreover, job resources may also be experienced differently by employees. Based on appraisal theory (Lazarus & Folkman, 1984), we examined how employees appraise their job resources. For four job resources (i.e., autonomy, colleague and supervisor support, feedback from others), we consistently found that employees appraised these resources primarily as challenges and to some degree also as hindrances across two studies. Further, the results showed that challenge appraisals and hindrance appraisals of four resources are negatively correlated among four job resources. These results are in line with the person-job fit theory (Edwards, 1991; van Vianen, 2018) and Warr's (1987) vitamin model, which proposed that job resources are not always desirable for all employees. In summary, our findings extend the job characteristics literature by revealing that employees can experience job characteristics concurrently as challenges and hindrances, and that hindrance appraisal can inhibit the positive effect of job resources on employee well-being.

Third, we examined the moderating role of appraisals on the relationship between job characteristics and employee well-being. By doing so, we advance the literature by suggesting how cognitive appraisals influence employee well-being and revealing the boundary conditions of the job characteristics–employee well-being relationship. While some studies have examined the mediating role of appraisals (e.g., Boswell et al., 2004; Liu & Li, 2018), relatively less attention has been paid to the moderating role of appraisals in the job characteristics literature (O'Brien & Beehr, 2019). Our study addressed this limitation and showed that challenge appraisals moderate the associations between time urgency, role conflict, and emotional demands and work engagement, which resonates with the findings of a recent study (Li et al., 2020). Similarly, hindrance appraisals moderate the relationship between job demands (time urgency and emotional demands) and burnout as found in Study 1. Koopmann et al. (2018) found that reappraisal can help prevention-focused employees to reframe their negative perceptions of events to be more neutral, thereby experiencing less negative emotions. These findings are consistent with Wortman and Silver's (1989) review that people who discover something positive in a negative situation show less distress than those who do not (e.g., Folkman, 1984; Natterson & Knudson, 1960).

Limitations and Future Directions

Our research is not without several limitations. First, we used a set of scenarios describing hypothesized situations instead of referring to participants' actual jobs, to measure the appraisals of the job characteristics in Study 1. As a result, these appraisals may reflect a general belief rather than measure participants' appraisals of the characteristics of their own jobs. This limitation was reduced by measuring appraisal in a different approach (i.e., referring to employees' current job characteristics instead of referring to a hypothetical situation) and using employees with similar job characteristics (i.e., nurses) in Study 2.

Second, to maximize the retention rates of our sample and guarantee adequate statistical power, we utilized a cross-sectional design; therefore, some concerns exist regarding common method bias (Podsakoff et al., 2003). However, we strived to reduce this issue by (a) conducting a replication study; (b) performing CFA, which showed that our focal variables can be differentiated from each other; and (c) an additional unmeasured common method factor that was included in our CFA model explained less than 10% of the variance in the items, supporting that common method bias does not have a substantial impact on the present findings. In addition, our hypothesized relationships are consistent with previous studies (Li et al., 2020), and the moderation effect was less likely to be affected by common method bias (Mitchell et al., 2019; Podsakoff et al., 2012); moreover, researchers have suggested that self-report data are valid when examining perceptual outcomes (Chan, 2009), and a meta-analysis has shown that collecting sensitive concepts data from the focal source is more accurate than other-reports (Carpenter et al., 2017). Thus, we believe the results were not unduly influenced by common method bias. Yet, it would be desirable for future research to collect data from other sources as well (e.g., from colleagues), to temporally separate the measurement of these variables, or to include objective measures (e.g., objective job demands, such as overtime working hours or the number of patients to be taken care of, cf. Dwyer & Ganster, 1991) to replicate our findings.

Finally, it would also be fruitful for future research to replicate our findings using more advanced designs like experience sampling methods (Bolger et al., 2003), to see how employees appraise different job characteristics in their daily work. Such research will be able to capture the dynamic interplay of job characteristics, work outcomes and appraisal. The transactional theory of stress (Lazarus & Folkman, 1984) denotes that an individual and his/her environment are in a dynamic and constantly changing relationship; this relationship is

bidirectional, with both the person and the environment being able to influence the other (Folkman, 1984). To examine this dynamic process, more advanced study designs are needed.

Implications for Practice

Although with the above limitations, the present study carries several practical implications. First, our study suggests that employees benefit from viewing a demanding situation as a challenge, i.e. as an opportunity for gain and growth. This implies that managers may use training programs to develop their employees' cognitive appraisals to reduce their levels of work stress. For example, meta-analysis has shown that cognitive-behavioral interventions (which aim to change an individual's appraisal and their responses) consistently provide more positive effects than other stress management interventions in work settings (Richardson & Rothstein, 2008). Thus, managers may consider adopting such interventions within the organizations. In addition, managers should establish a more balanced view that not all resources are equally beneficial for all employees since employees may appraise these resources differently. Managers should offer workshops to employees who will respond similarly to changes in their work situation, and individualized guidance to employees who differ in the appraisal of these changes.

Conclusion

How do employees evaluate their job characteristics? Our study showed that they perceive job characteristics differently and appraise them both as challenges and hindrances. In addition, such appraisals can alter the relationship between job demands/resources and employee well-being in terms of burnout and engagement. In particular, when employees see job demands as a challenge (i.e., seeing something bad as good), the adverse effect of job demands on engagement and burnout were weaker; or when they consider job resources as a hindrance (i.e., seeing something good as bad) weakens the beneficial effect of job resources on

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employee engagement and burnout. But a positive interpretation (challenge appraisal) of job resources will strengthen its positive effect on employee engagement and burnout. This knowledge is important in understanding how job characteristics influence employees and in guiding effective stress management efforts.

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Chapter 5

Today's Challenge may be Tomorrow's Hindrance (and vice versa): Longitudinal Changes in Employee's Appraisals of Job Demands and their Outcomes

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Abstract

Researchers have long been interested in understanding how appraisals influence the stressor–outcomes relationship. Most studies in this area employ a variable-centered approach, which ignores the possibility that there may be subpopulations of employees who may differ in the *combined* use of challenge and hindrance appraisals. Building on transactional stress theory, we investigated (a) the potential existence of distinct latent appraisals profiles of job demands (i.e., time urgency, role conflict, and emotional demands), (b) the outcomes associated with particular appraisal profiles, and (c) the stability of these profiles over time. In a two-wave study with one-year time interval (T1, $N = 535$, T2, $N = 152$) among Chinese workers, we identified three distinct profiles of appraisals in both study waves (i.e., “positivists”, “negativists”, and “intense workers”). The positivists reported the highest levels of engagement, job satisfaction, and the lowest levels of burnout. Interestingly, most participants appeared to change their appraisal profile over time (i.e., very often from “negativist” and “positivist” to “intense worker”, while they were less likely to change their appraisal profile to “positivist”). Further, job demands influenced employees' appraisal profiles. Taken together, our results shed light on the nature of the appraisal of demands in the work context and how different employees use distinct combinations of appraisal to address their work demands.

Keywords: Challenge appraisal, hindrance appraisal, job demands, latent transition analysis

Introduction

“Leaving out appraisal also would render the biological description of the phenomena of emotion vulnerable to the caricature that emotions without an appraisal phase are meaningless events.”

— Antonio Damasio (2003)

This quote from Damasio illustrates the importance of the appraisal of emotions. Appraisal, here defined as the subjective interpretation of job demands, has a potential for personal gain, growth (i.e., challenges) or constraint (i.e., hindrances) (LePine, Zhang, Crawford, & Rich, 2016). It has received growing research attention in work psychology over recent years. Researchers suggest that appraisal is ubiquitous and has implications for the study of work demands (Baethge, Deci, Dettmers, & Rigotti, 2019; Searle & Auton, 2015). Work demands refer to “those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological effort and are therefore associated with certain physiological and/or psychological costs” (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Empirical studies have shown that appraisal can mediate (e.g., Webster, Beehr, & Love, 2011) or moderate the demands–employee well-being relationship (e.g., Anonymous, 2020; Hewett, Liefoghe, Visockaite, & Roongrerngsuke, 2018; Li, Taris, & Peeters, 2020).

Despite the burgeoning research on the appraisal of job demands, many unresolved issues remain. For instance, empirical work on this topic has thus far been exclusively variable-centered, i.e., has focused on how different demand appraisals (i.e., as a challenge or a hindrance) independently relate to particular work outcomes (e.g., Ohly & Fritz, 2010; Searle & Auton, 2015). Results of this type of study represent an averaged–estimate of the relationships between variables, without systematically considering the possibility that the pattern of these relationships might differ meaningfully among subgroups of participants

(Morin, Morizot, Boudrias, & Madore, 2011). Most importantly, this *variable-centered* approach ignores the possibility that there are subpopulations of employees who differ in the *combined* use of challenge and hindrance appraisals. This is an important gap, as the transactional model of stress and coping states that different types of appraisals are not mutually exclusive (Lazarus & Folkman, 1984), meaning that it is theoretically possible for individuals to appraise a particular demand both as a challenge and as a hindrance. Recent empirical studies in appraisals have shown support for this in that challenge and hindrance appraisals of demands can be deployed simultaneously to varying degrees (Li et al., 2020). For instance, a recent study by Parnes, Boals, Brown, and Eubank (2020) showed that there is great heterogeneity in the appraisal of traumatic life events, and that distinct profiles of appraisal styles exist among populations (i.e., optimistic, “chump to champ”, and pessimistic profiles). It is possible that some people perceive certain demands as high-challenge and low-hindrance, while others perceive the same demands as high-hindrance and low-challenge (Staufenbiel & König, 2010; Van Laethem, Beckers, de Bloom, Sianoja, & Kinnunen, 2018). Therefore, our first goal is to investigate the presence of distinct subpopulations of employees who appraise the challenging and hindering aspects of demands in a similar way.

In addition, although previous research has shown that appraisals can change over time (e.g., Ohly & Fritz, 2010; Skinner & Brewer, 2002), it is unclear what the exact patterns of change are, and what the predictors of possible differences in these patterns are. The prevalence of specific appraisal patterns in the population may change over time because individuals may actively seek to transition between them. For instance, the transactional model of stress and coping states that appraisals emerge from the interaction between individual and contextual factors (Lazarus & Folkman, 1984). Prior research has shown that employees’ working conditions can change over time (Bujacz, Bernhard-Oettel, Rigotti, Hanson, & Lindfors, 2018). This suggests that when working conditions change (e.g., job

demands), the appraisals of these conditions may change accordingly. Therefore, our second goal is to explore the development of appraisal profiles over time.

Our study contributes to the appraisal of job demands literature in several ways. First, we investigate the appraisal of job demands using a *person-centered* approach (Wang & Hanges, 2011). This will shed light on the challenge-hindrance demands framework (e.g., (Cavanaugh, Boswell, Roehling, & Boudreau, 2000; Crawford, LePine, & Rich, 2010) by taking into account how subgroups apply these two types of appraisal conjunctly in managing multiple demands at work, instead of considering challenge and hindrance appraisals separately. In addition, the current study extends the appraisal literature by investigating the trait versus state-like nature of appraisals (Skinner & Brewer, 2002). Specifically, by employing a two-wave design with a 1-year interval we are able to investigate whether and how employees change their appraisals of job demands across time. We used a 1-year time lag, because this controls for potential seasonal effects that may affect job demands or well-being (e.g., returning to work from a vacation, see Ford et al., 2014, for a review). Moreover, although previous studies reported meaningful within-person variation in the appraisal of time pressure (Ohly & Fritz, 2010) or performance pressure across days (Mitchell, Greenbaum, Vogel, Mawritz, & Keating, 2019), the issue of appraisal variability needs further investigation using longer time frames. Researchers have suggested that long-term benefits of challenge appraisal are hard to achieve across time, because these costs energy, resources and adequate coping skills (Mazzola & Disselhorst, 2019). Our study addresses this issue as it allows for assessing longitudinal variations in employees' appraisal profiles. Our final contribution is that we identify how different appraisal patterns relate to employee well-being. In particular, in addition to providing empirical evidence on the distinction among appraisal patterns, our study validates these patterns by investigating the relationships of different patterns with employee well-being (i.e., job satisfaction, engagement, and burnout). We

selected these three well-being outcomes because job demands have been linked theoretically to these outcomes (e.g., in the Job Demands-Resources (JD-R) framework, Demerouti et al., 2001). Moreover, the associations between job demands and these outcomes have been well-established in meta-analytic studies (e.g., Alarcon, 2011; Christian, Garza, & Slaughter, 2011; Crawford et al., 2010; Judge, Bono, & Locke, 2000; Lesener, Gusy, & Wolter, 2019).

Appraisals of job demands

According to the transactional model of stress and coping, stressful experiences involve the interplay of the person (via appraisals) and the environment (via stressors; Ellis et al., 2015; Lazarus & Folkman, 1984). Lazarus and Folkman (1984) identified two stages of appraisal. In the primary appraisal stage, a person evaluates whether the stressor is a threat or a challenge to their goals or well-being, which, in turn, influences their cognitions and emotions (Lazarus & Folkman, 1984). In the secondary appraisal stage, one assesses whether she/he can cope with the situation (Folkman, 1984; Lazarus & Folkman, 1984).

A growing number of studies focus on the issue of appraisal using a variable-centered approach to explore how different appraisals independently (i.e., challenge or hindrance) relate to work outcomes (e.g., Liu & Li, 2018; Sessions, Nahrgang, Newton, & Chamberlin, 2019). In particular, building on the Challenge–Hindrance Model (CHM) (Cavanaugh et al., 2000; LePine, Podsakoff, & LePine, 2005), researchers suggested that there are two types of appraisals of job demands: challenge appraisal and hindrance appraisal (Webster et al., 2011). *Challenge appraisal* is defined as an individual's subjective interpretation that one's job demands have a potential for personal gain, growth, development; *Hindrance appraisal* refers to one's interpretation that demands constraint or thwart one's goal. Prior studies have related these two types of appraisals independently to employee outcomes. For instance, challenge appraisal has been found to positively relate to job satisfaction (Webster et al., 2011) and

engagement (Li et al., 2020), whereas hindrance appraisal was found to negatively relate to task performance (LePine et al., 2016) and prosocial behavior (Parker, Bell, Gagné, Carey, & Hilpert, 2019).

Identifying profiles of appraisal of job demands

In this study, we employed a latent profile analysis to identify different profiles of appraisals. To reflect typical aspects of the work environment, we included three commonly-used job demands: time urgency, role conflict, and emotional demands. These demands were included for three reasons. First, meta-analytic reviews have shown that these demands are well-established antecedents of employee well-being (Alarcon, 2011; Crawford et al., 2010). Second, time urgency, role conflict, and emotional demands reflect different aspects of one's job. Time urgency is defined as a situation that requires employees to engage in several time-oriented behaviors, including overall attention time, performing many tasks simultaneously, being impatient, being punctual, controlling deadlines, and scheduling tasks (Conte, Landy, & Mathieu, 1995). Role conflict refers to a situation that involves the simultaneous occurrence of two or more sets of pressures on the focal individuals, such that compliance with one makes compliance with the other(s) more difficult (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). Emotional demands refer to emotionally charged interactions at work that are considered to be an important source of job strain (Xanthopoulou, Bakker, & Fischbach, 2013). Thus, together these demands capture the time, role, and emotional aspects of one's job. Third, previous studies usually categorized time urgency as a challenge demand (e.g., Ohly & Fritz, 2010), and role conflict as a hindrance demand (e.g., Webster et al., 2011). However, the categorization of emotional demands has been inconsistent (as a hindrance demand: Albrecht, 2015; or as a challenge demand: Bakker & Sanz-Vergel, 2013). Including different "types" of job demands can, to some extent, increase the generalizability of our

study. Therefore, in this study job demands were not a priori categorized as challenges or hindrances. Instead, they were investigated by asking participants how they personally appraised them.

Building on the transactional model of stress and coping as well as on empirical studies we argue that it is possible for individuals to appraise a demand simultaneously as challenging and hindering. For instance, studies have already demonstrated that emotional demands (Li et al., 2020), time pressure (Kronenwett & Rigotti, 2020), and voice behavior (Sessions et al., 2019) have been appraised both as challenges and hindrances. In addition, the transactional model of stress and coping states that appraisals are a product of the interplay between a person and his/her environment, indicating that appraisals may be influenced by individual and social processes (Lazarus & Folkman, 1984). Thus, both contextual factors and individual factors will contribute to appraisals. In particular, indicators of appraisals can be combined in various ways, that is, more as a hindrance, more as a challenge, or both in different quantities. For instance, a recent study showed that there is considerable heterogeneity in self-appraisals following exposure to potentially traumatic life events, and that three distinct profiles of appraisal styles could be distinguished: An optimistic profile, a pessimistic profile, and a so-called “from chump to champ” profile, where participants improved self-appraisals over time (Parnes et al., 2020).

In addition, we would expect both stability and changes in appraisals over time. Skinner and Brewer (2002) argued that there are trait cognitive appraisal styles (refer to one’s “disposition to appraise ongoing relationships with the environment consistently in one way or another”; Lazarus, 1991, p. 138) and state appraisals (e.g., event-specific appraisals). So, even there will be some changes of appraisals across time, there will be also stability in their appraisals. There is no firm evidence indicates that job demands changes (e.g., emotional demands and role conflict) such as the employees experienced in our study will be sufficiently

strong to produce temporal instability in the profile structure of an entire sample of employees. Previous studies also suggest that although employees may move from one profile to another across time, the profile structure remains stable for the same sample of employees (e.g., Kam, Morin, Meyer, & Topolnytsky, 2016). In line with this, we expect that at both time points employees with an optimistic profile will mainly use challenge appraisal whereas employees in the pessimistic profile will mainly use hindrance appraisals. Taken together, we propose:

Hypothesis 1: Our study will be heterogeneous with regard to the appraisal profiles of job demands. It will include at least a dominant-challenge appraisal (i.e., positivist) profile, a dominant-hindrance appraisal (i.e., negativist) profile and a mixed profile (i.e. a profile that combines challenge and hindrance appraisals to some degrees).

Hypothesis 2: The same profiles will be present at both time points.

Outcomes of different profiles

Researchers have emphasized that latent profile analysis needs to provide a rigorous test of construct validity (e.g., Bauer & Curran, 2003; Morin et al., 2011). A promising way is to link profiles to outcomes, as this can provide a further illustration of the unobserved heterogeneity in the sample (Wang & Hanges, 2011). Therefore, we aim to validate these profiles by investigating the relationships of different patterns to employee well-being. This is because well-used job demand theories (e.g., JD-R theory, Bakker & Demerouti, 2017) and other findings consistently showed that job demands and appraisals are related to employee well-being (e.g., Li et al., 2020). Correspondingly, we examined whether the identified appraisal profiles exhibit different levels of three commonly examined well-being outcomes of job demands: work engagement, burnout, and job satisfaction (e.g., Alarcon, 2011; Christian et al., 2011; Humphrey, Nahrgang, & Morgeson, 2007). *Work engagement* refers to a positive,

fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). *Burnout* represents a negative type of well-being, which is a syndrome of weariness with work characterized by exhaustion, cynicism, and inefficacy (Maslach & Leiter, 2008). *Job satisfaction* is a pleasurable state resulting from the job (Bowling, Eschleman, & Wang, 2010). Thus, these three variables represent important well-being constructs.

Vroom's (1964) expectancy theory may explain why different appraisals are related to well-being outcomes differently. First, demands are likely to be associated with beliefs regarding the relationship between the levels of effort expended on coping with demands and the probability of success in meeting that demand (expectancy). Second, demands are likely to be associated with beliefs regarding the relationship between success in meeting the demand and obtaining outcomes with some associated degree of value or attractiveness (valence). Challenge appraisals of demands are expected to be associated with high motivation, as people are likely to anticipate that there is a positive relationship between the effort expended to coping with these demands and the likelihood of meeting these demands, and are also likely to believe that if these demands are met, valued outcomes will be obtained. Conversely, hindrance appraisals of demands are likely to be related to low motivation because these employees are likely to believe that no reasonable level of effort will be adequate to meet these types of demands. For example, prior studies showed that negative appraisals associated with reduced control and increased escape coping (Fugate, Kinicki, & Prussia, 2008). Therefore, they will tend to have low motivation to expend effort on coping, regardless of any desire to cope based on the subjective value of potential outcomes (LePine et al., 2005). Moreover, any effort expended to cope with the demands would likely be viewed as sapping resources that could otherwise be used for dealing with demands associated with valued outcomes that could be met (LePine et al., 2005, p. 765-766).

Supporting these arguments challenge appraisal has been shown to be positively related to employee well-being (Ben-Zur & Michael, 2007), whereas hindrance appraisal showed negative associations with employee well-being (Parker et al., 2019). Thus, individuals who deal with high job demands using dominant-hindrance appraisal are expected to be more exhausted, less satisfied, and less engaged with their jobs than those with a dominant-challenge appraisal. Specifically, the combination of low challenge appraisal and high hindrance appraisal is expected to be the most detrimental to worker well-being. Therefore, we propose

Hypothesis 3a: Positivists (highest challenge appraisal & lowest hindrance appraisal) will exhibit the highest levels of engagement and job satisfaction and lowest burnout, both concurrently and after a 1-year time lag.

Hypothesis 3b: Negativists (lowest challenge appraisal & highest hindrance appraisal) will exhibit the lowest levels of well-being.

Hypothesis 3c: Employees in a mixed profile will exhibit well-being higher than those with a negativist profile, but lower well-being than those in the positivist profile.

Stability of appraisals

Appraisals can be construed both as trait and state-like variables (Ohly & Fritz, 2010; Skinner & Brewer, 2002). Several studies have investigated the dynamic feature of appraisal of work stressors. For instance, Ohly and Fritz (2010) found that daily time pressure and job control are perceived as challenging, and that challenge appraisal in turn is related to daily creativity and proactive behavior. Similarly, within-person level challenge appraisal is positively related to positive affect, while hindrance appraisal is positively related to anger (Searle & Auton, 2015). Additionally, Mitchell et al. (2019) found that daily challenge appraisals of

performance pressure fuels engagement and productive behavior. Although these studies have demonstrated that appraisals of work stressors fluctuate over time, to date no study has investigated *how* the appraisal patterns of job demands change over time and whether and how employees transfer from one appraisal profile to another (i.e., individual stability). Therefore, we examine whether and how employees change their profiles of appraisals over 1 year.

Research Question 1: How do employees transfer from one type of appraisal of job demands profile to another over time?

Predictors of stability and change of appraisals

Work characteristics may influence the variations in employee appraisals. Especially negative working conditions (e.g., high job demands) may influence employees' appraisals. Given that challenge appraisals are more likely when there is a sense that an investment in time and energy will be rewarded in the demanding environment (Crawford et al., 2010; Lazarus & Folkman, 1984), job demands likely elicit challenge appraisals. Empirical studies have shown that workload and time pressure are appraised as being largely challenging (Webster et al., 2011). Similarly, Ohly and Fritz (2010) found that time pressure is related to challenge appraisals. Further, Bujacz et al. (2018) showed that employees' working conditions changed over time. Thus, with a change in job demands, their appraisals of these demands might change accordingly. We propose:

Hypothesis 4: Job demands (time urgency, role conflict, and emotional demands) will relate positively to the likelihood of an employee transitioning from a favorable (e.g., dominant-challenge appraisal profile) to a less favorable profile (e.g., dominant-hindrance appraisal profile or mixed profile) and will relate negatively with the likelihood of transitioning from an unfavorable profile to a more favorable profile.

Method

Procedures and Participants

We collected data at two time points, with a one-year interval in between. We mailed surveys to full-time employees who were randomly selected from a multi-occupation data base in China through an online survey company. The study was conducted following APA ethical principles (American Psychological Association, 2019). Questionnaires included a cover letter that assured confidentiality and that informed participants about the study purpose. After providing consent for using their responses for research purposes, respondents could continue with the questionnaire. We received 535 usable responses at Time 1 (an overall response rate of 20.50%). This cross-sectional sample has been used in a previous study (Anonymous, 2020). We contacted the 535 respondents one year later to ask them if they were willing to participate in a follow-up study (Time 2). They were asked to answer questions in line with Time 1 questions. As a reward for participating in our study, respondents received the equivalent of €1.67 in Chinese Renminbi. The Time 2 sample consisted of 152 adults (female = 89, 58.6%, and the Time 1-Time 2 response rate was 24%). Most participants held a bachelor's degree ($n = 118, 90.8\%$), their age ranged from 21 to 54 years ($M = 32.59, SD = 5.65$), and they had worked in their current job on average 6.9 years ($SD = 4.93$). On average they worked 40.10 hours per week ($SD = 10.48$).

Measures

The survey items were translated into Chinese using the back-translation procedures proposed by Brislin (1986). Unless otherwise stated, we used 7-point Likert-type scales ranging from 1 ("strongly disagree") to 7 ("strongly agree"). The Cronbach's alphas of our measures are reported in Table 1.

Job demands. *Time urgency* was measured using four items. Three of them were adapted from Maruping, Venkatesh, Thatcher, and Patel (2015). An example item is “I am not afforded much time to complete my tasks”. One item from Rodell and Judge (2009) was added to increase reliability (i.e., “I often experience time pressures in my work”). *Role conflict* was assessed with the three-item Cross-Cultural Role Conflict, Ambiguity, and Overload Scale (Peterson, Smith, Akande, Ayestaran, et al., 1995). A sample item is “In my job I often get involved in situations in which there are conflicting requirements”. *Emotional demands* were measured with a four-item Emotional job demands scale (Peeters, Montgomery, Bakker, & Schaufeli, 2005). An example item is “Does your work bring you in emotionally difficult situations?” Responses ranged from “never” (1) to “often” (5).

Appraisals of demands. In line with Li et al. (2020), for each of the three demands, we used 8 items adapted from Searle and Auton (2015) to measure the appraisals of job demands. Specifically, participants were asked to indicate to what extent they considered a job demand as a challenge or a hindrance. An example of challenge appraisal is “will help me to learn a lot”, and for hindrance appraisal “it will hinder any achievements I might have”. For appraisals of three different job demands, we used the factor scores to conduct our latent profile analysis.

Well-being. *Job satisfaction* was measured using Cook, Hepworth, Wall, and Warr’s (1981) three-item scale that reflects employees’ general satisfaction with their current jobs. Representative items include “Generally speaking, I’m really satisfied with my job” and “Usually, I really enjoy my work”. *Engagement* was assessed with the nine-item version of the Utrecht Work Engagement Scale (UWES) (Schaufeli, Bakker, & Salanova, 2006). A sample item is “at my work, I feel bursting with energy”. *Burnout* was measured with nine items of the Chinese version (Hu & Schaufeli, 2011) of the Maslach Burnout Inventory-General Survey (MBI-GS, Maslach, Jackson, Leiter, Schaufeli, & Schwab, 1986) with two

subscales: Exhaustion (five items; e.g., “I feel used up at the end of the workday”) and Cynicism (four items; e.g., ‘I have become less enthusiastic about my work”). These two subscales tap the core dimensions of burnout (Schaufeli & Taris, 2005). For engagement and burnout, responses were given on a 7-point frequency scale (0 = “never”, 6 = “daily”).

Statistical Analyses

Preliminary analyses

We conducted preliminary factor analyses to test the measurement model for the study variables. In addition, we tested the longitudinal measurement invariance of appraisals, and found that the appraisals of three job demands were measurement-invariant for factor loadings (i.e., the configural invariance model showed adequate fit, CFI = .936, TLI = .927, RMSEA = .039, which is also better than the alternative model that combined the three challenge appraisals into one factor and the three hindrance appraisals as another factor at the two measurement time points, CFI = .301, TLI = .250, RMSEA = .125, $\Delta\chi^2 (df) = 113.61, p < .001$). The results are reported in Supplementary Table 2. The factor scores generated on the basis of these preliminary results were saved and used for our main analysis (i.e., LPA and LTA), as researchers have suggested that factor scores can provide partial control for measurement errors, which is better than using mean scores. A similar approach has been used in previous LPA studies (e.g., Gillet, Morin, Cougot, & Gagné, 2017; Gillet, Morin, Ndiaye, Colombat, & Fouquereau, 2020).

Latent profile analyses

To identify groups of individuals with similar appraisals profiles of the three job demands, we conducted latent profile analyses at Time 1 and Time 2 separately (i.e., using the 12 appraisals factors: challenge and hindrance appraisals of time urgency, role conflict, and emotional

demands, at two time points). We estimated the model fit indices for the 2 to 8-profile solution at each time point, in which the means and variances of the appraisals factors were freely estimated in all profiles. However, following Morin et al. (2011) we also estimated alternative models in which the variances of the indicators were constrained to be equal across profiles. When conducting the latent profile analyses for each model, we used 3,000 random sets of start values and 100 iterations for these random starts and retained the 100 best solutions for final stage optimization (Morin, Litalien, Morin, & Litalien, 2019). In addition, to validate our profiles, we examined how different latent profiles related to well-being outcomes. In line with previous research (Gabriel, Daniels, Diefendorff, & Greguras, 2015), we used the R3STEP and the BCH commands (Lanza, Tan, & Bray, 2013) in Mplus 8 to model these outcomes, testing mean differences between profiles in terms of outcomes. To ensure that the nature of the profiles remained unchanged by the inclusion of outcomes, we used the SVALUES from the final LPA solution (Morin et al., 2019).

Latent transition analyses

To estimate which employees changed their profiles between two time points, a Mover-Stayer Latent Transition Analysis (MS-LTA; e.g., Collins & Lanza, 2010; Nylund, 2007) was used. Following suggestions of Nylund (2007), we tested the MS-LTA in a sequential, step-wise progression. First, a measurement invariance test using LTA was applied to test whether the identified profiles held up at two time points. In particular, following the tutorial by Morin et al. (2019, pp. S31-S33), we compared the longitudinal profile similarities of configural, structural, dispersion, and distributional similarity. From a LPA model of dispersion similarity, we conducted latent transition analysis. Next, a second-order latent transition analysis was conducted to detect which employees did or did not change their profile (i.e., “movers” and “stayers”, respectively). We tested a final model by adding (a) predictors of latent profile membership at Time 1 and Time 2 and (b) a variable that specified movement

between profiles from Time 1 to Time 2. We used Mplus 8 and followed the user's guide (Muthén & Muthén, 1998-2017) and Morin et al. (2019) to test the LTA. The Mplus syntax of our analyses can be found in the supplementary files.

Results

Table 1 reports the unstandardized means, standard deviations, Cronbach's alphas, and correlations of the study variables at Time 1 and Time 2. Note that our response-nonresponse analyses showed that the missing data may violate the assumption that the data are missing completely at random. Independent-sample *T*-tests showed no differences for participants' gender, age, education, tenure, and work engagement (i.e., vigor, dedication and absorption). However, employees who joined twice showed lower levels of emotional demands ($M_{\text{twice}} = 2.689$, $SD = 0.667$; $M_{\text{time 1}} = 2.852$, $SD = 0.829$; $t = -2.166$, $p = .031$), role conflict ($M_{\text{twice}} = 3.577$, $SD = 1.36$; $M_{\text{time 1}} = 3.859$, $SD = 1.382$; $t = -2.140$, $p = .033$), and burnout ($M_{\text{twice}} = 1.796$, $SD = 1.118$; $M_{\text{time 1}} = 3.138$, $SD = 1.168$; $t = -12.123$, $p < .001$) than those who only joined at Time 1. With this pattern of missing data, following the recommendation of Enders (2010) and in line with previous research (Bujacz et al., 2018), we utilized the maximum likelihood estimator with robust standard errors (MLR) in Mplus instead of using a listwise deletion of missing values approach (for technical issues in Mplus, see Bujacz et al., 2018).

Table 1. Means, Standard deviations, Cronbach's alphas, and Correlations

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1 Time urgency	.89											
2 Role conflict	.46**	.81										
3 Emotional demands	.55**	.50**	.77									
4 Time urgency CA	.14**	.16**	.04	.89								
5 Time urgency HA	.15**	.04	.18**	-.58**	.89							
6 Role conflict CA	.04	.28**	.04	.60**	-.41**	.91						
7 Role conflict HA	.11*	-.14**	.09*	-.38**	.52**	-.62**	.92					
8 Emotional demands CA	.01	.15**	.02	.47**	-.29**	.68**	-.41**	.93				
9 Emotional demands HA	.08	-.08	.05	-.35**	.44**	-.49**	.65**	-.64**	.92			
10 Job satisfaction	-.40**	-.31**	-.48**	.25**	-.29**	.24**	-.19**	.21**	-.15**	.86		
11 Burnout	.51**	.36**	.54**	-.11*	.27**	-.13**	.15**	-.13**	.15**	-.67**	.95	
12 Engagement	-.29**	-.21**	-.41**	.22**	-.28**	.30**	-.21**	.28**	-.24**	.66**	-.46**	.94
13 Time urgency	.44**	.35**	.33**	.12	-.01	.01	-.09	-.07	-.08	-.17*	.34**	-.13
14 Role conflict	.25**	.45**	.19*	.19*	-.07	.15	-.14	.04	-.14	-.02	.14	-.04
15 Emotional demands	.27**	.32**	.26**	.07	.01	.07	-.18*	-.04	-.12	-.23**	.36**	-.27**
16 Time urgency CA	-.03	.16	-.02	.32**	-.12	.35**	-.25**	.29**	-.27**	.17*	-.17*	.28**
17 Time urgency HA	.08	-.004	.08	-.06	.07	-.37**	.10	-.27**	.07	-.25**	.31**	-.35**
18 Role conflict CA	.10	.32**	.08	.39**	-.22**	.47**	-.39**	.32**	-.30**	.13	-.11	.17*
19 Role conflict HA	.11	-.04	.06	-.07	.21**	-.42**	.23**	-.37**	.22**	-.23**	.31**	-.25**
20 Emotional demands CA	-.01	.25**	.07	.29**	-.19*	.39**	-.28**	.45**	-.36**	-.02	-.11	.18*
21 Emotional demands HA	.03	-.17*	-.06	-.02	.03	-.28**	.04	-.32**	.12	-.08	.12	-.13
22 Job satisfaction	-.21**	-.18*	-.22**	.08	-.09	.07	.08	.20*	.01	.42**	-.40**	.39**
23 Burnout	.27**	.18*	.25**	-.15	.07	-.17*	.10	-.21**	.09	-.38**	.58**	-.52**
24 Engagement	-.18*	-.08	-.26**	.12	-.13	.18*	-.03	.25**	-.16*	.31**	-.41**	.47**
<i>M</i>	4.06	3.78	2.81	4.77	3.68	4.12	4.23	3.75	4.44	5.27	2.76	4.24
<i>SD</i>	1.42	1.38	.79	1.28	1.41	1.52	1.52	1.60	1.53	1.09	1.30	1.18

(Table continues overleaf)

Table 1 *continued*

Variables	13	14	15	16	17	18	19	20	21	22	23	24
13 Time urgency	.89											
14 Role conflict	.68**	.86										
15 Emotional demands	.65**	.678**	.82									
16 Time urgency CA	.20*	.27**	.11	.88								
17 Time urgency HA	.17*	.20*	.33**	-.19*	.90							
18 Role conflict CA	.23**	.44**	.32**	.65**	-.05	.92						
19 Role conflict HA	.28**	.11	.26**	-.02	.68**	-.23**	.91					
20 Emotional demands CA	.23**	.31**	.27**	.58**	-.04	.61**	-.05	.90				
21 Emotional demands HA	.23**	.21*	.20*	.04	.49**	-.05	.65**	-.09	.90			
22 Job satisfaction	-.22**	-.23**	-.39**	.18*	-.31**	-.01	-.25**	.12	-.12	.85		
23 Burnout	.41**	.34**	.39**	-.19*	.27**	-.03	.20*	-.10	.14	-.29**	.93	
24 Engagement	-.18*	-.16*	-.35**	.22**	-.34**	.03	-.25**	.19*	-.12	.73**	-.28**	.93
<i>M</i>	3.63	3.19	2.58	4.17	3.48	3.86	4.00	3.42	4.11	4.98	1.74	3.35
<i>SD</i>	1.53	1.63	0.96	1.64	1.65	1.72	1.75	1.69	1.82	1.50	1.19	1.35

Note: *, $p < .05$, **, $p < .01$. Variables 1-12 are measured at Time 1, $N = 535$; Variables 13-24 are measured at Time 2, $N = 15$; CA = challenge appraisal; HA = hindrance appraisal; Cronbach's alphas are reported on the diagonal and in bold.

Step 1: Diagnosis and Exploration of Cross-sectional Data using LPA

Following suggestions for conducting latent transition analysis (LTA) (Nylund, 2007; Ryoo, Wang, Swearer, Hull, & Shi, 2018), we first diagnosed and explored the data cross-sectionally, i.e. within each time point. We tested the LPA solutions of appraisals up to eight profiles (Kam et al., 2016). The decision on which model should be retained was based on model parsimony, fit statistics, and the substantive meaning of profiles. Specifically, for model fit the Bayesian Information Criterion (BIC) and the Bootstrap Likelihood Ratio Test (BLRT) have been shown to be the best indicators of the number of classes (Nylund, 2007). Table 2 provides the fit statistics for potential latent profile solutions of job demands appraisals. This table shows that for the appraisals of three job demands at Time 1, the models in which the variances were left free across profiles showed better fit than models in which these variances were constrained to be equal across profiles. The seven and eight-profile solutions were favored, with the values of AIC, BIC, and ABIC being the lowest for these models. Similarly, at Time 2 the seven and eight-profile solution models were favored with AIC, BIC, and ABIC being the lowest for these solutions. However, when considering LMRT, the lack of significance when moving from three to four profiles at Time 1 and 2 indicated that the four-profile solution did not fit the data better (especially for equal variances model), but the transition from two-profile to three-profile was significant. In addition, the four-profile solution did not show much improvement in model fit for AIC and BIC (Time 1, $\Delta AIC = 265$, $\Delta BIC = 210$; Time 2, $\Delta AIC = 73$, $\Delta BIC = 36$), however the three-profile solution showed better improvement (Time 1, $\Delta AIC = 502$, $\Delta BIC = 446$; Time 1, $\Delta AIC = 113$, $\Delta BIC = 73$). Altogether, there was a significant improvement in model fit when the three-profile solution was chosen. Thus, we retained the three-profile structure based on model parsimony, model fit, and ease of interpretation.

Based on item probabilities, we classified the most common profile (at Time 1) for employee appraisal of job demands as “intense workers”, reporting high levels of both challenge and high hindrance appraisals (Time 1, $n = 333$, 62.24%; Time 2, $n = 54$, 35.76%). Those with the next most common profile were labeled as “negativists”, referring to employees who appraised job demands as involving low challenge and high hindrance (Time 1, $n = 137$, 25.61%; $n = 81$, 53.64%, Time 2). “Positivists” were those who appraised job demands as the highest challenge and lowest hindrance (Time 1, $n = 65$, 12.15%; $n = 16$, 10.60%, Time 2). Thus, the results revealed three different profiles (i.e., intense workers, negativists, and positivists) at two measurement time points. Figures 1 and 2 show the final patterns of our three profile models. The results supported Hypotheses 1 and 2.

Table 2. *Model Comparison in Cross-Sectional Latent Profile Analyses*

Model	<i>k</i>	LL	SCF	fp	AIC	BIC	ssaBIC	Entropy	VLMRT	BLRT
Time 1 Free variances in all profiles										
	2	-3388.79	1.53	25	6827.57	6934.63	6855.27	.84	.04	< .001
	3	-3124.58	1.11	38	6325.16	6487.88	6367.26	.92	< .001	< .001
	4	-2978.94	1.19	51	6059.89	6278.28	6116.39	.89	.06	< .001
	5	-2907.53	1.67	64	5943.05	6217.12	6013.96	.90	.77	< .001
	6	-2840.09	1.28	77	5834.18	6163.91	5919.49	.88	.23	< .001
	7	-2774.45	1.11	90	5728.90	6114.30	5828.61	.89	.10	< .001
	8	-2714.63	1.13	103	5635.26	6076.33	5749.37	.88	.19	< .001
Time 1 Equal variances across profiles										
	2	-3445.90	1.27	19	6929.80	7011.16	6950.85	.82	< .001	< .001
	3	-3206.17	1.10	26	6464.33	6575.67	6493.14	.88	< .001	< .001
	4	-3093.08	1.53	33	6252.16	6393.47	6288.72	.84	.31	< .001
	5	-3036.92	1.65	40	6153.83	6325.12	6198.15	.82	.47	< .001
	6	-2969.57	1.53	47	6033.13	6234.40	6085.21	.85	.23	< .001
	7	-2917.49	1.37	54	5942.99	6174.23	6002.81	.86	.10	< .001
	8	-2875.57	1.36	61	5873.13	6134.35	5940.72	.86	.24	< .001
Time 2 Free variances in all profiles										
	2	-1049.45	1.06	25	2148.89	2224.32	2145.20	.94	< .001	< .001
	3	-980.19	1.03	38	2036.38	2151.04	2030.77	.94	.01	< .001
	4	-929.74	1.02	51	1961.48	2115.36	1953.95	.92	.05	< .001
	5	-887.81	1.01	64	1903.62	2096.73	1894.17	.93	.12	< .001
	6	-858.85	0.96	77	1871.70	2104.03	1860.33	.97	.30	< .001
	7	-835.38	1.13	90	1850.75	2122.30	1837.46	.91	.88	< .001
	8	-814.86	0.98	103	1835.73	2146.51	1820.52	.95	.20	< .001
Time 2 Equal variances across profiles										
	2	-1075.72	1.03	19	2189.45	2246.78	2186.64	.91	< .001	< .001
	3	-1014.17	1.05	26	2080.35	2158.80	2076.51	.87	.01	< .001
	4	-986.87	1.13	33	2039.74	2139.31	2034.87	.89	.16	< .001
	5	-963.48	1.04	50	2006.96	2127.65	2001.06	.89	.14	< .001
	6	-939.00	1.07	47	1972.01	2113.82	1965.07	.90	.18	< .001
	7	-914.87	1.16	54	1937.74	2100.68	1929.77	.91	.48	< .001
	8	-892.12	1.20	61	1906.25	2090.30	1897.24	.91	.45	< .001

Note: *k* = number of latent profiles in the model; LL = model log likelihood; SCF = scaling correction factor of the robust maximum likelihood estimator. fp = number of free parameters; AIC = Akaike information criterion; BIC = Bayesian information criterion; SABIC = sample-adjusted BIC; BLRT = *p* value of the parametric bootstrapped likelihood ratio test for *k*-1 vs. *k* classes; VLMRLRT = Vuong-Lo-Mendell-Rubin likelihood Ratio Test.

To establish the validity of this solution we compared employees' well-being among these three different profiles. As presented in Table 3, at Time 1 positivists (high challenge & low hindrance appraisal) showed the best well-being (i.e., the highest job satisfaction, highest employee engagement in terms of vigor, dedication, and absorption; and the lowest burnout of

cynicism and emotional exhaustion) as compared to negativists and intense workers. Even one year later, the lagged effect of Time 1 membership in the positivist profile resulted in the best well-being. Conversely, the negativist workers showed the worst well-being (i.e., the lowest job satisfaction, lowest work engagement, and the highest burnout) compared to other profiles. The intense workers (high challenge appraisal & high hindrance appraisal) reported the second-best well-being (i.e., work engagement), suggesting that even though these people use high hindrance appraisal strategies, high challenge appraisal may also benefit their well-being. There was no significant difference between negativists and intense workers on employee job satisfaction and burnout.

As expected, at Time 2 we found that positivists showed significantly better well-being (the highest job satisfaction, highest engagement, and the lowest burnout) than other profiles. The intense workers showed significantly higher levels of job satisfaction and work engagement than the negativists. For burnout, while positivists differed significantly from negativists and intense workers (for details see Table 3), there was no significant difference between intense workers and negativists. These results illustrate that different profiles of appraisal of job demands relate to different levels of employee well-being. Hypothesis 3 was supported.

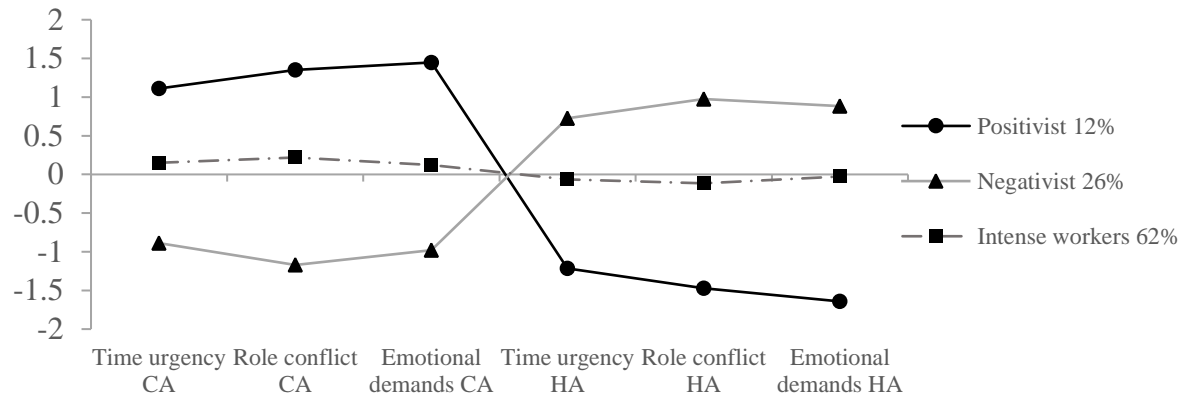


Figure 1. Time 1 Patterns of item response probabilities for the three profiles

Note: CA = Challenge appraisal; HA = Hindrance appraisal; Profile indicators are estimated from factor scores.

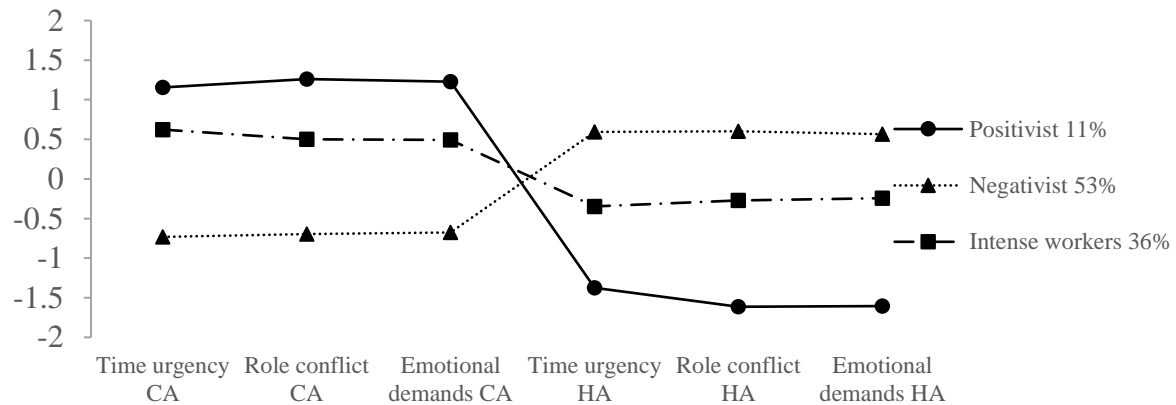


Figure 2. Time 2 Patterns of item response probabilities for the three profiles

Note: CA = Challenge appraisal; HA = Hindrance appraisal; Profile indicators are estimated from factor scores.

Step 2: Test longitudinal measurement invariance using LTA

On the basis of Step 1, the three-profile model was retained at both time points and validated using different outcome variables. In the next step, we tested the longitudinal measurement invariance to show whether this solution is supported by using LTA. In particular, we tested the longitudinal profile similarities of configural, structural, dispersion, and distributional similarity within the three-profile solution. The results supported the dispersion similarity of the three-profile solutions, based on the lowest BIC standard as well as theoretical and practical considerations (for detailed results see Supplementary Table 3). We also compared the solutions up to 8 profiles at two time points. However, the three-profile solution still showed the highest ΔAIC and ΔBIC . Thus, we decided to retain the three-profile solution and considered the latent profile model as longitudinally invariant. This further supported Hypothesis 2, stating that the same profile would exist at both time points.

Step 3: latent transition analysis

The latent transition analysis addressed our first research question of whether employees change their profile across time. Table 4 presents the probabilities of change between profiles from Time 1 and Time 2. The results showed that membership of the “negativist” and “intense worker” profiles was fairly stable ($n = 307$, 57% and $n = 137$, 26% of workers tend to stay in these profiles over time); whereas membership of the positivist profile was rather unstable (38% of workers stayed in this class over time), and they were more likely to move to the group of intense workers ($n = 57$, 11%). Interestingly, overall these transitions resulted in an increasing prevalence of the intense workers' subgroup, due to positivists ($n = 57$, 11%) and negativists ($n = 11$, 2%) moving to the intense workers' group. Only few participants moved towards the positivist subtype (for intense workers, $n = 11$, 2%; for negativists, $n = 1$, 0.2%). This shows that employees are more likely to change their appraisal profile of job demands to intense workers while they were less likely to change their profile to positivist and negativist.

Step 4: Mover-Stayer LTA with predictors

Finally, we tested whether job demands (time urgency, role conflict, and emotional demands) predicted the presence or absence of change in appraisal profile membership. We found that Time 1 role conflict ($B = 0.680$, $p = .091$) and time urgency ($B = 0.554$, $p = .002$) predicted a higher relative likelihood to be move from one profile to another. In addition, Time 1 role conflict ($B = 0.206$, $p < .001$) was associated with having a negativist profile. Similarly, Time 2 role conflict ($B = 0.409$, $p = .036$) and time urgency ($B = 1.543$, $p = .003$) were positively related to belonging to the negativist workers profile. Emotional demands significantly predicted a higher relative likelihood of being in the positivist profile (for the likelihood of

belonging to the Time 1 positivist profile, $B = 0.220$, $p < .001$; for the Time 2 positivist profile, $B = 0.244$, $p < .001$). Thus, hypothesis 4 was partially supported.

Table 4. *Profile Membership and Transition Probabilities*

	Positivist (1)	Negativist (3)	Intense workers (2)
Transition probabilities from Time 1 classes (rows) to Time 2 classes (columns)			
Positivist (1)	0.38	0.00	0.62
Negativist (3)	0.02	0.81	0.18
Intense workers (2)	0.15	0.07	0.78
Final profile counts and proportions based on the most likely latent pattern			
Time 1	Time 2	<i>N</i>	%
3	3	307	0.57
2	2	137	0.26
1	3	57	0.11
2	3	11	0.02
3	1	11	0.02
1	1	7	0.01
3	2	4	0.01
2	1	1	0.002

Note: Probabilities of staying in the same profile are marked in bold.

Discussion

The current study employed a person-centered approach (Wang & Hanges, 2011) to investigate how employees appraise different job demands across time. In a two-wave study (with *N*s of 532 and 152 at T1 and T2, respectively), we identified at both time points the existence of three groups of employees (i.e., positivists, negativists, and intense workers) that qualitatively (challenge and hindrance) and quantitatively differed (i.e., high and low) in their perceived job demands. The measurement of these three profiles was invariant across time. These results supported our Hypotheses 1 and 2 in that distinct profiles of appraisals exist among employees at both time points.

In addition, we validated these profiles by associating them with outcomes (i.e., well-being). Specifically, at both time points, employees labeled as positivists showed the highest job satisfaction and work engagement, and the lowest level of burnout. Conversely, the negativists reported the worst well-being at both time points. Indeed, even one year later, the lagged effect of Time 1 membership in the positivist profile resulted in the best well-being, as compared to intense workers and negativists. These results supported Hypothesis 3 by showing how employees' well-being differs as a function of job demands appraisal profile membership, both concurrently and after a 1-year time lag.

Our first research question was whether employees change their appraisal across time. Our results showed that membership of the "negativist" and "intense workers" profiles was fairly stable, whereas membership of the "positivists" profile was rather unstable. Interestingly, "movers" moved from the groups of positivists and negativists towards an intense workers profile. Moreover, employees were less likely to move towards the positivist group and negativist group. This might be because high appraisal (challenge and hindrance) draws on one's resources, and in order to conserve their limited resources, employees will use different strategies when addressing different job demands (Hobfoll & Shirom, 2000).

Finally, Hypothesis 4 stated that job demands (time urgency, role conflict, and emotional demands) would predict a change of appraisal profile membership. We found that job demands indeed predicted appraisal profile membership, in that employees with high job demands (i.e., role conflict and time urgency) were more likely to be movers. Moreover, role conflict and time urgency were positively related to belonging to the negativist profile. These findings partially support Hypothesis 4.

Theoretical Implications

One major theoretical contribution of this study is that our results showed differences in appraisals of job demands within a group of employees, who were in the past treated as a homogeneous group. In particular, we identified the existence of three groups of employees (positivists, intense workers, and negativists) that differed in their appraisals of job demands. These results are consistent with the notion that different types of appraisals are not mutually exclusive (Lazarus & Folkman, 1984); Similarly, prior studies found that job demands can be appraised as challenging and hindering at the same time (Li et al., 2020). Notably, this is the first empirical study that examined the combined effect of appraisals of job demands, and how these combined challenge and hindrance appraisals relate to outcomes. Although this could also have been tested using a variable-centered approach involving an interaction effect of challenge and hindrance appraisal, our study focused on subgroup members and showed how the appraisal of three different demands influences employee outcomes in a more nuanced way. Further, our study revealed differences in the outcomes of particular appraisal profiles. This validates the existence of different subgroups, and contributes to the appraisal literature by showing how different appraisal profiles relate to employee well-being (i.e., positivists show higher well-being than negativists and intense workers).

Second, our study also showed that employees appear to change their appraisal of demands across time. For one thing, this sheds light on the measurement of appraisals. Apparently, a single measurement of appraisal cannot truly capture the dynamic status of appraisals. This suggests that more state-of-the-art multi-wave designs, such as experience sampling methods, should be taken for future research on the appraisals of job demands. In addition, although previous studies using a diary method already revealed that appraisals can vary within persons (e.g., Ohly & Fritz, 2010), our study demonstrated *how* employees changed their appraisal of job demands over time. Our results showed that membership of the

“negativists” and “intense workers” profiles was fairly stable; however, employees often changed towards an intense workers appraisal style and were less likely to change their appraisal profile towards a positivist appraisal style. In addition, our study revealed that job demands can influence the variances of employee mover-stayer status. Employees with high job demands (i.e., role conflict) were more likely to be movers.

Practical Implications

Our study has at least two important practical implications. First, it is important for managers to create a climate in organizations in which it becomes possible for employees to appraise their job demands as challenging, for instance, by emphasizing the potential gains and achievements of job demands. Since we found that employees labeled as positivists (i.e., who appraised their job demands as high-challenging and low-hindering) showed the highest level of job satisfaction and work engagement, and the lowest level of burnout. Relatedly, our mover-stayer analysis demonstrated that positivists were most likely to change their profile membership, often moving from a positivist to an intense worker profile. Negativists were less likely to become positivists. Accordingly, creating a supportive environment that maintains a positivist outlook and that fosters positive change (i.e., moving from a negativist or an intense worker profile to a positivist profile) seems important.

Second, when designing a training or intervention program, managers need to consider individual differences and should think of using differentiated training practices for different subgroups. Specifically, we found that workers who appraise their job demands as negative showed the worst employee well-being. This suggests that intervention programs are especially needed for these employees. By identifying to which appraisal profile an employee belongs, managers may consider which interventions need to be introduced for whom. Our study implies that employees benefit from appraising job demands as challenging and not

hindering in terms of levels of work engagement, burnout, and job satisfaction. Appraisal training workshops may be provided in order to improve employee well-being. In particular, job crafting-based intervention programs could be helpful (e.g., teaching employees how to adapt demands and resources to their own preferences by using cognitive job crafting and seeking resources). Cognitive job crafting refers to “redefining or reframing one’s occupational role, tasks, and job boundaries” (Wrzesniewski & Dutton, 2001). For instance, this could involve training employees to view their work in a larger context or focusing on personally meaningful aspects (e.g., broader benefits for oneself and others) (for a protocol of such a job crafting intervention, see Demerouti, Peeters, & van den Heuvel, 2019, p.107). In addition, we found that job demands influence the variances of employee mover-stayer status and that high job demands are positively related to belonging to the negativist profile. Teaching employees how to seek resources (e.g., performance feedback, advice from coworkers, support from managers) may help them address their job demands (Demerouti et al., 2019) and to achieve a “positive appraisal profile”. Previous findings have shown that employees who have enough job resources available can cope better with their job demands (Bakker & Demerouti, 2017).

Limitations and Future Directions

Several limitations of this study should be addressed in future research. First and foremost, as we used an online data pool, the response rates were relatively low (i.e., less than 30%; note that this is not uncommon in longitudinal research, cf. Taris, 2013), in spite of the fact that we tried to increase response rate by reminding participants several times and by providing incentives. Further, our nonresponse analyses showed that the non-respondents who joined only once tended to experience a higher level of job demands and burnout than participants who joined twice. This might have biased our results, as our conclusions are based on the participants who tend to experience relatively low levels of burnout. For instance, at Time 1

the largest profile was that of the intense workers (62%), however, at Time 2, we found that the negativist profile was the largest (54%). We can interpret this as that participants changed their membership. However, an alternative explanation is that some "intense workers" were dropped out. To address this limitation, instead of using a listwise approach, we utilized the maximum likelihood estimator with robust standard errors (MLR) (Bujacz et al., 2018) to conduct our analyses. However, generalization of our results beyond the current sample and context should still be undertaken with caution.

Second, we relied on self-report measures, which means that results might be biased by social desirability and common method bias (Podsakoff, MacKenzie, & Podsakoff, 2012). Related to this, we measured job demands also in a subjective way, which might already include some subjective appraisals. We suggest that future research could focus on some objective job demands, such as the number of customers a service worker needs to take care of, or the number of hours of overtime work. In the same vein, it would be good to include other-ratings of outcome variables, such as from the supervisor or from colleagues.

Third, for measuring appraisal we used in this study a measure that refers to a general belief of employees' appraisal of a hypothesized situation. This measure does not tap on the appraisal of their current job demands. This might not truly reflect how employees appraise their own job characteristics. Instead, it reflects probably more a general tendency of appraisal. In order to get more close to how employees appraise their own job demands in their current work situation, future studies could use the experience sampling method to capture how employees appraise their own job demands in daily life.

Finally, we did not conduct the LTA analysis for appraisals of each demand separately, instead, we included appraisals of three job demands. It is reasonable to investigate the appraisals profiles of different job demands together, because employees need

to address multiple demands in their work. Moreover, it is highly possible that there are subgroups of employees who perceive different job demands in a similar way (as illustrated in our study: positivist, negativist, and intense workers). A similar approach was also used in previous work, for instance, Bujacz et al. (2018) investigated the latent class of employees' working conditions with seven job characteristics (e.g., workload, time pressure, and learning opportunities), and found four classes of psychological work conditions: supporting, constraining, demanding, and challenging. This methodological decision may be regarded as a limitation, since time urgency, role conflict, and emotional demands are different demands. Future research can investigate whether our findings apply to other job demand appraisals as well (e.g., motivational job demands, Taris & Hu, 2020).

Conclusion

Studies on the nature and consequences of job characteristics usually assume that all employees experience particular job demands in a similar way. In our research, using a two-wave panel design, we demonstrated that employees can experience job demands as challenging and hindering at the same time. There appeared to be three subgroups when appraising job demands: 1) positivists, 2) intense workers, and 3) negativists. The positivists showed the best well-being (as indicated by high scores on job satisfaction, work engagement, and low scores on burnout). The negativists showed the worst well-being. In addition, employees tended to change their profile over time, especially from a positivist or negativist profile to an intense workers profile. Moves towards a positivist profile were less likely. Practitioners are encouraged to consider promoting a challenge appraisal of job demands, and to help the negativists and intense workers to look on the bright side of working life.

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Chapter 5

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Chapter 6

Country Differences in the relationship Between Leadership and Employee

Engagement: A Meta-Analysis

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Abstract

Leadership is frequently related to important organizational outcomes such as follower engagement. However, to date we have little insight into the degree to which this relation is contingent upon (a) types of leadership style and (b) national culture. These two issues are addressed in a meta-analysis of 209 independent (257 effect sizes), mainly cross-sectional studies (79%), involving 82,386 participants from 45 countries. The findings show that whereas abusive supervision was negatively associated with work engagement, several leadership styles (e.g., servant, empowering, ethical, and charismatic leadership) have positive correlations with subordinate engagement; some dimensions of national culture (e.g., gender egalitarianism, human orientation, performance orientation, future orientation, and power distance) moderate the leadership–employee engagement relationship. However, the correlations between servant, ethical, and transactional leadership and subordinate engagement are less likely to vary across national cultural characteristics. Notwithstanding the proliferation of leadership–employee engagement literature with more than 200 published articles, a strong reliance on cross-sectional designs has impeded it to gain any solid conclusions about causality due to endogeneity biases. We conclude by providing a detailed future research agenda and discussing how our results can stimulate future leadership research and inform practices with regards to leadership development.

Keywords: leadership, work engagement, national culture, cultural tightness-looseness, meta-analysis

Introduction

Work engagement is a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). Engaged employees experience more positive emotions (Bakker, Demerouti, & Sanz-Vergel, 2014), higher levels of in-role and extra-role performance (Christian, Garza, & Slaughter, 2011), and better psychological and physical health (Bakker, Schaufeli, Leiter, & Taris, 2008). However, the Gallup Employee Engagement Report indicated that in 2016, only 34% of the employees in the United States were engaged (Harter, 2018), and that disengaged employees cost the USA somewhere between \$450 and \$550 billion each year (O'Boyle, & Harter, 2013). Similarly, the European Working Conditions 2015 Survey revealed that in Sweden, Greece, and Germany, respectively, only 6.1%, 4.8%, and 4.3% of the employees were highly engaged, and that there is a great deal of variability in employee engagement across thirty-five European countries (Schaufeli, 2018). These high disengagement rates as well as the importance of employee engagement for employee health and productivity have generated numerous studies that investigated its antecedents (Rich, Lepine, & Crawford, 2010).

In this respect, although longitudinal and (quasi-)experimental work is scarce, an increasing number of studies suggest that leaders play an important role in employee work engagement (Bakker & Albrecht, 2018). The Gallup organizational research indicates that at least 70% of the variance in team engagement can be explained by the quality of the leader (Harter, 2018). Unfortunately, so far, most empirical studies assess a single leadership style and employee engagement and have mainly taken single-country samples into account. Comparisons of the relationship between leadership styles and engagement across countries have been largely ignored. Both the fit logic of national culture research (i.e., leader's practices are "consistent" with employees' expectations; Newman & Nollen, 1996; Rabl,

Jayasinghe, Gerhart, & Kühlmann, 2014) and the implicit leadership theory, which states that individuals have their implicit beliefs, convictions, and assumptions concerning attributes and behaviors of effective leaders (Offermann, Kennedy, & Wirtz, 1994), suggest that leadership is culturally contingent (House, Hanges, Javidan, Dorfman, & Gupta, 2004). For example, the GLOBE research program, as well as a growing number of empirical studies (e.g., Lian, Ferris, & Brown, 2012) have shown that the influence of leaders varies considerably as a consequence of the cultural forces in the countries in which the leaders function. Yet, the extent to which the relationship of leadership and employee engagement is culturally contingent remains unclear.

To fill this gap, this study investigates whether the strength of the associations between leadership and employee engagement varies across national cultures. We aim to contribute to the literature in three ways: First, by systematically *meta-analyzing* the moderating role of national culture, our study sheds light on cross-cultural differences in the relationship between perceived leadership and employee engagement. As suggested by Schyns and Schilling (2013), only the perception of leader behavior by employees can affect employees' outcomes. Therefore, in this study leadership refers to follower's perception of leaders' behavior. Second, in addition to transformational leadership, we include different types of leadership constructs in our meta-analysis, such as authentic, servant, engaging, and ethical leadership that were only to a limited extent covered in previous engagement studies (e.g., Bedi, Alpaslan, & Green, 2016; Kim, Beehr, & Prewett, 2018). Finally, we examine a set of potential methodological moderators of the leadership–employee engagement relationship. Following these discussions, we draw attention to major limitations that currently apply to this field (especially a strong reliance on cross-sectional designs which cannot establish causal effects due to *endogeneity biases*), and further provide pragmatic suggestions for future research.

Leadership and Employee Engagement: A Moderating Effect of National Culture?

Although Bass (1997) argued that transactional leadership and transformational leadership are culturally universal, numerous studies have shown that culture moderates the relationship between leadership and employee outcomes (Gelfand, Erez, & Aycan, 2007, for a review). One might assume that cultural differences will also exist in the leadership–employee engagement relationship, meaning that the relationships between leadership and engagement may be contingent on certain cultural values (Kirkman, Chen, Farh, Chen, & Lowe, 2009; Lian et al., 2012).

To address the question of whether and to what extent the relationship between leadership and employee engagement differs across countries, in line with previous cross-cultural meta-analyses (e.g., Rabl et al., 2014) we rely primarily on national culture perspectives (House et al., 2004). These perspectives emphasize that national cultural differences thwart or even dictate whether management or leadership practices will be effective in different countries (Rabl et al., 2014). In addition, Gelfand, Nishii, and Raver (2006) suggested that the variance in individual attributes will be lower in countries with tight national cultures, because in such countries strong norms clearly prescribe the behaviors that are appropriate in particular situations, and there is a lower tolerance of deviant behavior than in culturally looser countries (Rabl et al., 2014). Therefore, we include tightness-looseness as an important country-level moderator.

National culture

Hofstede (1980) defined national culture as the collective programming of one's mind that distinguishes the members of one group or category of people from another. To investigate national culture as a moderator of the leadership–employee engagement relationship, we decided to first focus on power distance, uncertainty avoidance, collectivism, assertiveness,

and performance orientation. These are well-established and well-tested dimensions of national culture (Hofstede, 1980; Rabl et al., 2014). Meta-analytic reviews suggest that collectivism (Rockstuhl, Dulebohn, Ang, & Shore, 2012), power distance (Mackey, Frieder, Brees, & Martinko, 2015), uncertainty avoidance (House et al., 2004; Yan & Hunt, 2005), and masculinity vs. femininity (Zhang, Liu, Xu, Yang, & Bednall, 2019) moderate the relationship between leadership and employee outcomes. Further, we include future orientation, gender egalitarianism, and human orientation as important cultural dimensions. The GLOBE leadership project demonstrated that these dimensions significantly differentiate among societies and organizations, and that there is significant respondent agreement within cultures for all these dimensions (House et al., 2004). It should be mentioned that in the current study we examine the between-study moderating effect of national culture.

The fit logic of national culture research (Rabl et al., 2014) suggests that when leadership fits with a national culture, employees are likely to feel satisfied, engaged, and committed. As a result, they may be able or willing to perform well (Newman & Nollen, 1996). Therefore, we argue that when leadership fits well with a national culture, the relationship between leadership and employee engagement will be stronger. Previous studies have convincingly demonstrated that transformational leadership (e.g., Hoch, Bommer, Dulebohn, & Wu, 2016), servant leadership (Hunter, Neubert et al., 2013), ethical leadership (Bedi et al., 2016), authentic leadership (Hoch et al., 2016; Neider & Schriesheim, 2011), transactional leadership (Judge & Piccolo, 2004), engaging leadership (Nikolova, Schaufeli, & Notelaers, 2019), charismatic leadership (Chen & Huang, 2016), and empowering leadership (Kim et al., 2018) are positively related to employee engagement. These eight leadership styles represent dimensions of *positive leadership* (Hoch et al., 2016). Building on this argument, we propose that the best-fitting national culture for an optimal relationship between positive leadership style and subordinates' engagement is one high on gender

egalitarianism, high on human orientation, low on power distance, low on in-group collectivism, high on performance orientation, high on future orientation, high on assertiveness, and low on uncertainty avoidance.

Gender Egalitarianism. Gender egalitarianism is defined as the extent to which “an organization or a society minimizes gender role differences while promoting gender equality” (House et al., 2004). In a highly gender-egalitarian society, individuals care about others, about the quality of life and about interpersonal relationships (Hofstede, 2001). As a result, employees are more likely to react positively to positive leadership behaviors (as a kind of social exchange, Blau, 1964; Brown & Treviño, 2006). Specifically, when followers perceive a leader as caring and being concerned for their well-being or when they receive support and trust, they feel obliged to reciprocate that behavior (Bedi et al., 2016; Gouldner, 1960). Therefore, the positive leadership–employee engagement relationship should be stronger in a high gender-egalitarian country (vs. low) (*Hypothesis 1a*).

Human orientation. Human orientation is the extent to which an organization or society encourages and rewards individuals for being fair, altruistic, friendly, generous, caring, and kind to others (Den Hartog, House et al., 1999). In high human orientation societies, members are responsible for promoting the well-being of others and people are more strongly urged to provide social support to each other than in other societies (House et al., 2004). Therefore, cultures that emphasize social support and promote others’ well-being fit well with the nature of positive leadership behaviors (e.g., caring and support; Bedi et al., 2016). Thus, the positive leadership–employee engagement relationship will be stronger in a high human orientation country (vs. low) (*Hypothesis 1b*).

Power distance. Power distance is “the extent to which a community accepts and endorses authority, power differences, and status privileges. In high power distance countries,

power, authority, and information are unequally distributed” (House et al., 2004, p. 536), and reward allocation is based on other criteria than performance (Aycan, 2005). Since it is not one’s capacities and performance that are rewarded, employee’s motivation to engage in their work may be reduced. Thus, this cultural setting may reduce the effectiveness of leadership that aims to increase performance by enhancing employee engagement. Conversely, in low power distance cultures ability and performance play an important role in promoting and motivating employees (Rabl et al., 2014). Thus, motivation related to leadership components such as trust and support are more congruent with low power distance countries. Therefore, the positive leadership–employee engagement relationship will be stronger in a low power distance country (vs. high) (*Hypothesis 1c*).

In-group Collectivism. In-group collectivism measures the degree to which individuals are integrated into groups and “express pride, loyalty, and interdependence in their families” (House et al., 2004). In high in-group collectivistic cultures, individual achievement is not valued; and even though individuals play an important role, rewards are often given to the collective (Yan & Hunt, 2005). Selection and training/development decisions are often based on personal connections, in-group status, and social obligations (House et al., 2004). Contrarily, in low in-group collectivistic cultures, greater weight is given to decisions based on individual differences in ability, skills, and performance. In such cultures, employee engagement-oriented leadership behaviors fit well with this culture. Consequently, the positive leadership–employee engagement relationship will be stronger in a low in-group collectivism country (vs. high) (*Hypothesis 1d*).

Performance orientation. House et al. (2004) defined performance orientation as the extent to which a society “encourages and rewards innovation, high standards, and performance improvement”. High performance-oriented societies emphasize results more than people, reward performance, and have a “can-do” attitude, whereas low performance-oriented

societies emphasize loyalty and belongingness (House et al., 2004). Given the focus on results and performance in high performance-oriented cultures, leadership that highlights performance through employee engagement will fit well with such a culture. Thus, the positive leadership–employee engagement relationship will be stronger in a high performance-oriented country (vs. low) (*Hypothesis 1e*).

Future orientation. Future orientation is the extent to which “members of a society or an organization believe that their current actions will influence their future, focus on investment in their future, believe that they will have a future that matters...” (House et al., 2004, p.285). Societies high on future orientation tend to have employees who are intrinsically motivated, achieve economic success, and value long-term success more than low future orientation societies (House et al., 2004). Thus, a high future-oriented culture could be a setting that enhances the effectiveness of leadership styles (e.g., trust, fairness and support) that increase employee motivation. Therefore, the positive leadership–employee engagement relation will be stronger in a high future-oriented country (vs. low) (*Hypothesis 1f*).

Assertiveness. The concept of assertiveness reflects “beliefs as to whether people are or should be encouraged to be assertive, aggressive, and tough or nonassertive, nonaggressive, and tender in social relationships” (House et al., 2004, p.395). High assertiveness cultures value success and progress, hold just-world beliefs, and expect demanding and challenging targets, whereas low assertiveness countries tend to value people and warm relationships, and hold unjust-world beliefs (House et al., 2004, p.405). The emphasis on “just world” in high assertiveness countries has a better fit with positive leadership, such as social exchange and its associated norms of reciprocity and trust (Bedi et al., 2016). The positive leadership–employee engagement relation will be stronger in a high assertiveness country (vs. low) (*Hypothesis 1g*).

Uncertainty avoidance. Uncertainty avoidance (UA) refers to the degree to which “ambiguous situations are threatening to individuals, to which rules and order are preferred, and to which uncertainty is tolerated in a society” (House et al., 2004, p.602). High uncertainty avoidance societies tend to take more moderate calculated risks, show stronger resistance to change, and show less tolerance for breaking rules (House et al., 2004, p.618). To reduce uncertainty, leaders in high UA societies often adopt structural formalization and centralization policies, which reduces the degree to which important information and decision-making are shared with subordinates. Conversely, in low uncertainty avoidance cultures information is shared with employees. Leadership components such as trust and support fit better with low uncertainty avoidance countries. Therefore, the positive leadership–employee engagement relationship will be stronger in a low uncertainty avoidance country (vs. high) (*Hypothesis 1h*).

Abusive supervision. Leaders’ abusive behavior damages the quality of social exchange between the victim and their leader (Peng, Schaubroeck, & Li, 2014), and subordinates may decrease their work effort when they feel treated unfairly by their supervisors (Liu & Wang, 2013). As a result, abusive supervision is negatively related to employee well-being (Tepper, Simon, & Park, 2017). Building on the cultural fit logic, that is, when leadership does not fit with its national culture, the relationship between abusive supervision (*negative leadership*; Mackey et al., 2015) and employee engagement will be strongly negative. For instance, employees in a low power distance country are more sensitive to negative leadership behavior, because they believe that such negative leadership behavior violates norms (i.e., does not fit with the national culture) for interpersonal interactions (Hofstede, 1980; Zhang & Liao, 2015). Based on the above reasoning about how the national culture dimensions influence the positive leadership – employee engagement relationship, we expect that

Hypothesis 2: The relationship between abusive supervision and employee engagement will be more strongly negative in countries characterized by high gender equalitarianism (H2a), high human orientation (H2b), low power distance (H2c), low collectivism (H2d), high performance orientation (H2e), high future orientation (H2f), high assertiveness (H2g), and low uncertainty avoidance (H2h) than in other countries.

National culture's tightness-looseness. Cultural tightness-looseness is defined as the strength of social norms and the degree of sanctioning within societies (Gelfand et al., 2006), and refers to how external norms and constraints relate to cross-cultural differences in behavior. Gelfand et al. (2006) predicted that the variance in individual attributes is less likely to occur in societies with tight national cultures because norms are stronger in such societies and they have a lower tolerance of deviant behavior than loose societies. Taras, Kirkman, and Steel (2010) have found that the predictive power of national culture on employee individual workplace attitudes and behavior is stronger for tighter, rather than looser cultures. Thus, the fit between leadership and national culture will be more important in tight cultures: leaders' practices that are congruent with employee expectations will have stronger positive correlations with employee engagement, whereas leadership that is inconsistent with employee expectations will have stronger negative correlations with employee engagement for tight national cultures.

Hypothesis 3: Cultural tightness-looseness will moderate the positive leadership–employee engagement relationship, such that the relationship between positive leadership styles and employee engagement will be more positive in countries characterized by a tight national culture as well as high gender egalitarianism (H3a), high human orientation (H3b), low power distance (H3c), low in-group collectivism (H3d), high performance orientation (H3e), high future orientation (H3f), high assertiveness (H3g), and low uncertainty avoidance (H3h), compared to looser national cultures.

Hypothesis 4: Cultural tightness-looseness will moderate the abusive supervision – employee engagement relationship, such that the relationship of abusive supervision–employee engagement will be strongly negative in countries characterized by both a tight national culture and high gender equalitarianism (H4a), high human orientation (H4b), low power distance (H4c), low in-group collectivism (H4d), high performance orientation (H4e), high future orientation (H4f), high assertiveness (H4g), and low uncertainty avoidance (H4h), compared to loose national cultures.

Potential Moderators

Publication status. Publication bias refers to researchers' and editors' inclination to publish only significant results (Rosenthal, 1979). There are mixed findings regarding the effect of this “file drawer problem” on the relationship between antecedents and employee engagement. Whereas Bedi et al. (2016) found stronger mean-corrected correlations for published rather than for unpublished studies, Christian et al. (2011) found a stronger correlation between engagement and job characteristics (e.g., social support and autonomy) for unpublished studies than for published work. Overall, the effect of publication status on leadership and employee engagement is unclear.

Study design. It has been suggested that longitudinal studies should report lower correlations than cross-sectional studies (Christian et al., 2011). In addition, as diary studies often account for more sources of variation, Christian et al. (2011) suggested a stronger correlation for within-person studies than for between-person designs. Thus, we will investigate whether the relations between leadership and employee engagement differ across different study designs.

Measurement type. The Utrecht Work Engagement Scale (UWES) (Schaufeli, Bakker, & Salanova, 2006) is the most frequently used measure of employee engagement (Christian et

al., 2011). However, other measures are available and it is possible that the magnitude of a correlation will be influenced by the measure that is used. For example, Christian et al. (2011) found that the contextual performance–engagement relation was significantly stronger for other measures than the UWES. Thus, we will examine whether there are differences among the UWES and other measures of engagement.

Rating source of leadership. In the leadership literature, the self-other rating agreement (SOA) issue has been discussed by researchers (Zhang & Liao, 2015). It is highly possible that a self-serving bias will affect the relationship between leadership and employee engagement. As a result, leader-assessed leadership may differ from employee-perceived leadership behavior, which may influence the leadership employee engagement relationship.

In summary, the present study provides a meta-analytic estimate of the degree to which the association between leadership and employee engagement differs across countries and to what degree national culture, cultural tightness-looseness, and methodological moderators may help to explain any such differences.

Method

Literature Search

We conducted an extensive search to identify as many published and unpublished studies as possible. Databases utilized in the search were PsycINFO, Web of Science, EBSCO, ProQuest Dissertation, Scopus, and Google Scholar. The search included terms related to (1) leadership and (2) engagement. For leadership, we used the terms *leadership*, *leader*, and *supervisor*; selected leadership terms were *transformational leadership*, *authentic leadership*, *ethical leadership*, *servant leadership*, *abusive supervision*, *paternalistic leadership*, *charismatic leadership*, and *transactional leadership*. For engagement, we used the term *work engagement*, and combinations of *job*, *work*, *employee*, *physical*, *emotional*, *cognitive*, *vigor*,

dedication, and *absorption* with the keyword *engagement* (Christian et al., 2011). We also conducted a manual search in major journals (i.e., *Journal of Applied Psychology*, *Academy of Management Journal*, *Personnel Psychology*, *Journal of Organizational Behavior*, and *The Leadership Quarterly*) and checked the reference lists of articles on work engagement and leadership, including theoretical reviews (e.g., Bakker & Albrecht, 2018; Carasco-Saul, Kim, & Kim, 2015) and meta-analytic reviews (e.g., Banks, McCauley, Gardner, & Guler, 2016; Hoch et al., 2016; Mackey et al., 2015). We obtained 4,913 records from searching the databases and 59 hits from manual search records. The primary search was conducted in March 2018. In March 2020 we updated our search (i.e., a search of published studies from 2018 to March 2020), resulting in an additional 2,225 articles. After removing 1,960 duplicated articles that due to searching in different databases, a total of 5,237 articles (3,791 from primary search, and 1,446 from updating search) were advanced to title and abstract screening.

Primary Inclusion Criteria and Coding Procedures

For inclusion, each primary study had to (a) present a quantitative field study; (b) contain measures of leadership and work engagement at the individual level; (c) report sample sizes along with correlations or statistical results that allowed us to adequately calculate the effect size, and (d) be written in English. Studies that did not meet these standards were excluded.

The first screen of the primarily searched abstracts was initially double-screened for relevance by two of the authors with an initial agreement of 94.5% (210 conflicts among 3,791 studies); disagreements were resolved to 100% agreement after discussion. The updating searched 1,446 articles were screened by the first author only. This produced 334 potentially relevant articles. In the second round, two of the authors independently double-coded 100 articles. For these papers, the inter-rater observed agreement (e.g., sample sizes,

reliabilities, effect size, etc.) was 96.75%, and the initial Cohen's kappa was .70, which indicates good agreement (Cohen, 1960). All discrepancies were resolved after discussion, resulting in 100% agreement for inclusion. Then the first author coded the remaining 234 articles, independently coding the effect sizes twice after which differences were checked and corrected. To deal with studies using the same data set, following the suggestions of Wood (2008), we recorded the names of all authors of each study and then arranged these in alphabetic order to detect duplicate studies. If studies had authors in common, we further checked the study characteristics and samples. Ultimately we found 6 duplicate studies (i.e., same author(s), same data). These were eliminated from further analysis. Further, there are some studies only reporting regression coefficient. After contacting the primary authors to request the correlation table, we deleted studies of which the authors failed to provide the correlation table ($n = 14$). Because researchers have suggested that using standardized regression weights (i.e., beta coefficients) to impute missing correlations is associated with potentially large biases when estimating aggregated effect sizes (Roth, Le, Oh, Van Iddekinge, & Bobko, 2018). This process produced 209 studies and 257 effect sizes (Online Supplementary Appendix A1 reports the included studies along with sample sizes and effect sizes; Appendix A2 shows a flowchart of our literature search).

Finally, we included 9 leadership styles (i.e., transformational, authentic, ethical, servant, charismatic, transactional, engaging, and empowering leadership, and abusive supervision). Table 1 presents the study characteristics for the nine leadership styles.

Table 1. *Study Characteristics for the Leadership Styles*

Leadership Styles	Average year of publication	Total number of studies	Total number of samples	N	Number of published samples	Same-time samples
Overall	2016	209	217	82,386	170(78%)	172(79%)
Transformational	2015	99	100	39,482	77(77%)	89(89%)
Authentic	2016	46	46	15,223	34(74%)	31(67%)
Ethical	2016	22	23	6,940	22(96%)	14(61%)
Servant	2016	25	26	8,639	17(65%)	17(65%)
Abusive Supervision	2016	11	11	2,958	9(82%)	5(45%)
Transactional	2016	23	23	6,664	13(57%)	21(91%)
Empowering	2017	10	10	8,846	8(80%)	7(70%)
Charismatic	2015	4	4	2,182	3(75%)	3(75%)
Engaging	2018	5	6	2,087	4(67%)	4(67%)

Note: The total number of effect sizes are 257 (30 studies have included more than one leadership, for details see online supplementary Appendix A1). The included studies have been published in more than 100 different journals, and there are 14 journals published more than three papers.

Meta-analysis procedures

Random effect meta-analytic procedures were applied using the R metafor packages (Viechtbauer, 2017). The sample-weighted mean correlations and their variances were corrected for sampling error. For those studies that only reported the correlation between leadership dimensions and engagement, we used Hunter and Schmidt's (2004) formula to integrate effect sizes.

To test our hypotheses, we used a five-stage process. First, we tested how each leadership style related to employee engagement. Second, we conducted a 7 (leadership styles) \times 8 (country level scores of culture) moderation analysis to test the moderation effect of national culture. We conducted meta-regression for leadership styles that were included in at least ten studies (Borenstein, Hedges, Higgins, & Rothstein, 2011), so engaging leadership ($k = 6$) and charismatic leadership ($k = 4$) were excluded from meta-regression analysis. An

exception is abusive supervision as it is the only negative leadership in our study; and following suggestions of Higgins and Thompson (2004), to control the risk of spurious findings from our meta-regression models, permutation tests (which is a specific form of resampling methods) were conducted if significant moderation effect was found for small samples (i.e., $k < 10$). The permutation tests have been suggested as a well-established mean to calculate significance levels in meta-regression analysis (Higgins & Thompson, 2004), and we conducted it in R ‘metafor’ package by using the “permutest” function (Viechtbauer, 2017, p.150-152). For each study, we identified the country in which the survey had been conducted. Unfortunately, studies did not usually include national culture as a variable. Therefore, in line with previous meta-analyses (Rabl et al., 2014; Rockstuhl et al., 2012), we used the GLOBE research scores of each dimension (i.e., gender egalitarianism, human orientation, power distance, in-group collectivism, performance orientation, future orientation, assertiveness, and uncertainty avoidance; House et al., 2004) as a measure of national culture. Note that some countries in our meta-analysis were not included in the GLOBE research. Cultural dimensions of these countries were treated as missing values, which makes the number of included studies in moderation analysis differ from that in calculating the pooled effect sizes (i.e., Table 2). Third, to test the joint moderation effect of national cultural dimensions and cultural tight-looseness, we used Gelfand, Raver, et al.'s (2011) scores to place 45 countries along this dimension (Rabl et al., 2014; Taras et al., 2010). Fourth, we tested other potential moderators (e.g., publication status, study design, and measurement of engagement) and tested for publication bias and influential studies (Del Re, 2015). Finally, we performed several sensitivity analyses and diagnostics by inspecting the outliers, funnel plot (trim and fill), and P-curve; and correcting for measurement error. Specifically, we conducted specific-sample removed sensitivity analyses by removing studies with effect sizes that exceeded the 95% CI of the overall effect size (Harrer, Cuijpers,

Furukawa, & Ebert, 2019; Hunter & Schmidt, 2004). In addition, we used Cronbach's alpha coefficient of internal consistency to correct correlations for artifact distributions of measurement error for perceptions of leadership and work engagement. In line with the previous meta-analysis (e.g., Mackey et al., 2015), for studies that do not report Cronbach's alpha, we used a mean internal consistency value from other studies included in our meta-analysis. We reported these results in the aggregated effect sizes in Table 2.

Results

Table 2 presents a summary of the meta-analytic results for the associations between employee engagement and perceptions of different leadership styles. The sample-size weighted average correlations were positive for employee engagement and servant ($k = 26$, $\rho = .474$), ethical ($k = 23$, $\rho = .457$), transformational ($k = 100$, $\rho = .430$), charismatic ($k = 4$, $\rho = .455$), authentic ($k = 46$, $\rho = .419$), empowering ($k = 10$, $\rho = .460$), engaging ($k = 6$, $\rho = .345$), and transactional leadership ($k = 23$, $\rho = .275$). In addition, follower-perceived abusive supervision was negatively associated with employee engagement ($k = 9$, $\rho = -.233$). It should be mentioned that in the current study, all the "effect sizes" between different leadership styles and employee engagement are correlations and cannot be interpreted as causal effects.

Although the leadership–employee engagement effect sizes were statistically significantly different from zero, the size of the underlying correlations varied considerably (from $-.233$ to $.474$). In addition, as indicated in Table 2, we found a significant Q statistic and high I^2 (applying the 75% rule described in Hunter & Schmidt, 2004), which indicates there is sufficient heterogeneity for potential moderators to be investigated (D'Innocenzo, Mathieu, & Kukenberger, 2016). Next, we report the test of moderation effects of national culture and the results of other moderators.

Table 2. *Meta-Analysis Results for Leadership and Engagement*

Variable	<i>k</i>	<i>N</i>	<i>r</i>	ρ	<i>SE</i> ρ	Q	Lower	Upper	I ²	H ²	ρ Correct Measurement error	ρ sensitivity analysis	Trim- and fill
Transformational	100	39,482	.418	.430	.022	1508.106***	.395	.465	94.19%	17.2	.473	.432	.468
Authentic	46	15,223	.407	.419	.029	590.584***	.371	.465	91.95%	12.43	.464	.414	.471
Ethical	23	6,940	.440	.457	.047	398.612***	.381	.528	93.29%	14.91	.499	.426	.558
Servant	26	8,639	.465	.474	.035	206.250***	.420	.525	89.48%	9.51	.519	.462	.474
Abusive Supervision	9	2,662	-.232	-.233	.026	13.539(.09)	-.280	-.185	40.57%	1.68	-.253	-.233	-.244
Transactional	23	6,664	.270	.275	.034	146.315***	.212	.336	85.65%	6.97	.326	.266	.343
Empowering	10	8,846	.453	.460	.059	144.304***	.365	.546	93.50%	15.39	.495	.469	.571
Charismatic	4	2,182	.437	.455	.140	139.721***	.213	.644	96.36%	27.48	.508	.455	.641
Engaging	6	2,087	.342	.345	.051	24.655***	.254	.430	80.52%	5.13	.389	.345	.366

Note: *N* = total number of respondents; *k* = number of independent samples included; *r* = weighted mean correlation; ρ = sample-size-weighted mean observed correlation; *SE* ρ = standard error for population estimate; I² is an index of heterogeneity computed as the percentage of variability in effects sizes that are due to true differences among the studies; Q provides information on whether there is statistically significant heterogeneity (i.e., yes or no heterogeneity). $\rho_{sensitivity\ analysis}$ = specific-sample removed sensitivity analyses; $\rho_{correct\ measurement\ error}$ = mean score correlation (corrected for unreliability for both variables and sampling error variance).

Moderation Effects: National Culture

Hypothesis 1 stated that the correlations of positive leadership style and subordinates' engagement will be stronger for members in countries of high gender egalitarianism, high human orientation, low power distance, low collectivism, high performance orientation, high future orientation, high assertiveness, and low uncertainty avoidance. Out of 56 tested interactions (8 National characteristics \times 7 Leadership styles), we found 10 significant moderation effects (i.e., 17.86%) (for a summary, see Table 3). We describe these moderation results below (for detailed results see online supplementary Appendix B).

Gender egalitarianism. We found that gender egalitarianism negatively moderates the relationships between several leadership styles and employee engagement (for transformational leadership, $k = 83$, $B = -.260$, $p = .021$; and empowering leadership, $k = 8$, $B = -.487$, $p = .019$, $p_{\text{permutation test}} = .044$). Contrary to our prediction, the effect size (i.e., mean corrected correlation) was higher ($k = 23$, $\rho = .500$; and $k = 1$, $\rho = .678$ for transformational leadership and empowering leadership, respectively) in countries with low gender egalitarianism (i.e., 1 standard deviation below the mean) than in high gender egalitarianism countries ($k = 14$, $\rho = .324$; and $k = 1$, $\rho = .181$ for low transformational leadership and empowering leadership, respectively). The relationships between leadership styles of authentic ($k = 36$, $B = -.194$, $p = .109$), ethical ($k = 17$, $B = .419$, $p = .085$), servant ($k = 20$, $B = -.048$, $p = .825$), and transactional ($k = 20$, $B = .099$, $p = .546$), and engagement were not different between high and low gender egalitarian countries (H1a was not supported).

Human orientation. We found that human orientation negatively moderates the relationship between empowering leadership and employee engagement ($k = 8$, $B = -.244$, $p = .007$, $p_{\text{permutation test}} = .040$). Contrary to our prediction, the mean corrected correlation was lower ($k = 1$, $\rho = .182$) in countries with high human orientation than in countries with low

human orientation ($k = 2$, $\rho = .678$). Other moderation effects of human orientation on leadership–employee engagement effect sizes were insignificant (for transformational, $k = 83$, $B = .073$, $p = .238$; authentic, $k = 36$, $B = .045$, $p = .590$; ethical, $k = 17$, $B = -.028$, $p = .812$; servant, $k = 20$, $B = -.162$, $p = .365$; transactional, $k = 20$, $B = .094$, $p = .236$) (Hypothesis 1b was not supported).

Power distance. The results showed that power distance positively moderates the relationship between authentic leadership and employee engagement ($k = 36$, $B = .165$, $p = .046$). Contrary to our prediction, the mean corrected correlation was higher ($k = 10$, $\rho = .558$) in countries with high power distance (i.e., 1 standard deviation above the mean) than in low power distance countries ($k = 8$, $\rho = .390$). No other significant moderation effects for power distance were found (for transformational, $k = 83$, $B = -.007$, $p = .910$; servant, $k = 20$, $B = .084$, $p = .484$; transactional, $k = 20$, $B = .027$, $p = .752$; empowering leadership, $k = 8$, $B = .483$, $p = .103$, $p_{\text{permutation test}} = .152$; and ethical leadership, $k = 17$, $B = -.153$, $p = .219$) (Hypothesis 1c was not supported).

In-group collectivism. The results showed that in-group collectivism did not statistically significantly moderate any leadership–employee engagement relationship (for transformational, $k = 83$, $B = .006$, $p = .858$; authentic, $k = 36$, $B = .049$, $p = .310$; ethical, $k = 17$, $B = -.057$, $p = .403$; servant, $k = 20$, $B = .054$, $p = .330$; transactional, $k = 20$, $B = -.019$, $p = .658$; and empowering leadership, $k = 8$, $B = -.307$, $p = .574$). Hypothesis 1d was not supported.

Performance orientation. The results showed that performance orientation moderates the relationship between leadership styles (for transformational leadership, $k = 83$, $B = .225$, $p = .009$; authentic leadership, $k = 36$, $B = -.413$, $p = .005$) and employee engagement. Specifically, contrary to our hypothesis, the mean corrected correlation was higher (for

transformational leadership, $k = 5$, $\rho = .488$; authentic leadership, $k = 7$, $\rho = .566$) in countries with low performance orientation (i.e., 1 standard deviation below the mean) than in countries with high performance orientation (transformational leadership, $k = 43$, $\rho = .478$; authentic leadership, $k = 3$, $\rho = .223$). Performance orientation did not statistically significantly moderate other leadership–employee engagement relationships (for ethical, $k = 17$, $B = -.004$, $p = .988$; servant, $k = 20$, $B = -.0106$, $p = .456$; transactional, $k = 20$, $B = .010$, $p = .928$; and empowering leadership, $k = 8$, $B = -.293$, $p = .437$). Hypothesis 1e was not supported.

Future orientation. We found future orientation positively moderates the relationship between leadership styles of ethical ($k = 17$, $B = .348$, $p = .019$) and empowering ($k = 8$, $B = -.420$, $p = .021$, $p_{\text{permutation test}} = .042$) and employee engagement. The mean corrected correlation was higher (for ethical leadership, $k = 3$, $\rho = .723$; empowering leadership, $k = 7$, $\rho = .564$) in countries with high future orientation than in average future orientated countries (for ethical leadership, $k = 14$, $\rho = .420$; empowering leadership, $k = 1$, $\rho = .182$); No further statistically significant moderation effects of future orientation on the relationship between leadership and employee engagement were found (transformational, $k = 83$, $B = .030$, $p = .638$; servant, $k = 20$, $B = -.013$, $p = .927$; authentic, $k = 36$, $B = -.029$, $p = .748$; transactional, $k = 20$, $B = -.025$, $p = .750$). Hypothesis 1f was partially supported.

Assertiveness. Assertiveness did not statistically significantly moderate any leadership–employee engagement relationship (for leadership styles of transformational, $k = 83$, $B = .072$, $p = .307$; authentic, $k = 36$, $B = .114$, $p = .261$; ethical, $k = 17$, $B = .161$, $p = .292$; servant, $k = 20$, $B = .107$, $p = .353$; transactional, $k = 20$, $B = -.074$, $p = .296$; empowering, $k = 8$, $B = .393$, $p = .064$, $p_{\text{permutation test}} = .136$). Thus, Hypothesis 1g was not supported.

Uncertainty avoidance. We found uncertainty avoidance negatively moderates the servant leadership–employee engagement relationship ($k = 20$, $B = -.198$, $p = .014$). As expected, the mean corrected correlation was lower ($k = 6$, $\rho = .343$) in countries with high UA than in countries with low UA ($k = 4$, $\rho = .678$). Other moderation effects of UA were statistically not significant (for transformational, $k = 83$, $B = .064$, $p = .290$; authentic, $k = 36$, $B = -.051$, $p = .602$; ethical, $k = 17$, $B = -.096$, $p = .322$; transactional leadership, $k = 20$, $B = .015$, $p = .876$; and empowering leadership, $k = 8$, $B = -.183$, $p = .191$). Hypothesis 1h was partially supported.

Hypothesis 2 stated that national culture would moderate the abusive supervision–employee engagement relationship. Human orientation significantly moderates the abusive supervision–employee engagement relationship ($k = 8$, $B = -.176$, $p = .012$, $p_{\text{permutation test}} = .006$). As expected, the negative correlation was higher in countries with high human orientation ($k = 7$, $\rho = -.254$) than in countries with low human orientation ($k = 1$, $\rho = -.131$). The moderation effects of gender egalitarianism ($k = 8$, $B = .248$, $p = .235$), power distance ($k = 8$, $B = .165$, $p = .344$), ingroup-collectivism ($k = 8$, $B = -.061$, $p = .067$, $p_{\text{permutation test}} = .142$), performance orientation ($k = 8$, $B = -.192$, $p = .493$), future orientation ($k = 8$, $B = .275$, $p = .037$, $p_{\text{permutation test}} = .101$), and assertiveness ($k = 8$, $B = .123$, $p = .039$, $p_{\text{permutation test}} = .114$), and uncertainty avoidance ($k = 8$, $B = -.056$, $p = .425$) on the relationship between abusive supervision and engagement were insignificant (only Hypothesis 2b was supported). Note that the subgroup estimates were based on a small number of primary studies.

Tightness-looseness of National Culture

Hypotheses 3 proposed that the fit between positive leadership and national culture will be more important in tight cultures. Out of 48 interactions, we did not find any significant

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interaction effects (Hypotheses 3a-h were not supported, detailed results can be found in online supplementary Appendix C).

Similarly, no significant results were obtained for the joint effects of cultural tightness-looseness and national culture on abusive supervision-employee engagement. Thus, Hypotheses 4 was not supported, detailed results can be found in online supplementary Appendix C.

Table 3. *Summary of Analyses of Moderation Effect of National Cultures*

Variables	Gender Egalitarianism	Human orientation	Power Distance	In-group Collectivism	Performance Orientation	Future Orientation	Assertiveness	Uncertainty Avoidance	Ratios of significant interactions/interactions tested (%)
Transformational	1	0	0	0	1	0	0	0	.25
Authentic	0	0	1	0	1	0	0	0	.25
Ethical	0	0	0	0	0	1	0	0	.13
Servant	0	0	0	0	0	0	0	1	.13
Abusive Supervision	0	1	0	0	0	0	0	0	.13
Transactional	0	0	0	0	0	0	0	0	.00
Empowering	1	1	0	0	0	1	0	0	.38

Note : 1= significant interaction; 0 = insignificant.

Other Moderators

Publication status. Table 4 moderation analyses revealed no significant differences between published ($k = 77$, $\rho = .456$; $k = 34$, $\rho = .430$; $k = 17$, $\rho = .490$; $k = 13$, $\rho = .264$, respectively) and unpublished studies ($k = 23$, $\rho = .474$; $k = 12$, $\rho = .493$; $k = 9$, $\rho = .566$; $k = 10$, $\rho = .311$, respectively) for transformational ($t = 0.173$, $p = .678$), authentic ($t = 0.592$, $p = .442$), servant ($t = 1.285$, $p = .257$), and transactional leadership ($t = 0.498$, $p = .480$), and employee engagement.

Table 4. *Meta-Analysis Results for Leadership and Engagement: the Role of Publication Status*

Leadership	Subgroup	k	ρ	SE ρ	95%CI		Q	I ²	t	p
					Lower	Upper				
Transformational	published	77	.456	.026	.404	.507	1381.94	.95	0.173	.678
	unpublished	23	.474	.035	.405	.543	125.919	.83		
Authentic	published	34	.430	.028	.375	.485	255.528	.87	0.592	.442
	unpublished	12	.493	.078	.341	.645	308.031	.96		
Servant	published	17	.490	.047	.399	.582	142.699	.89	1.285	.257
	unpublished	9	.566	.048	.472	.66	45.5675	.82		
Transactional	published	13	.264	.050	.165	.362	116.981	.90	0.498	.480
	unpublished	10	.311	.043	.226	.396	28.4129	.68		

Note: k = number of independent samples included. ρ = correlation for population estimate corrected for attenuation due to sampling error variance; SE ρ = standard error for population estimate; I² is an index of heterogeneity computed as the percentage of variability in effects sizes that are due to true differences among the studies; Q provides information on whether there is statistically significant heterogeneity (i.e., yes or no heterogeneity).

Study design. Table 5 reports the moderation analysis of study design. Ethical ($t = 8.063, p = .005$) and servant leadership ($t = 5.115, p = .024$) and employee engagement showed stronger mean corrected correlations for cross-sectional studies ($k = 15, \rho = .571; k = 17, \rho = .570$) than for longitudinal ($k = 8, \rho = .354; k = 9, \rho = .417$) studies. Although transformational ($t = 0.487, p = .485$), authentic leadership ($t = 0.178, p = .673$) and employee engagement showed stronger mean corrected correlations for cross-sectional studies ($k = 90, \rho = .459; k = 42, \rho = .455$, respectively) than for longitudinal studies ($k = 6, \rho = .404; k = 3, \rho = .389$), the difference were insignificant. Finally, we compared the effect sizes of within-person level (e.g., a given employee's engagement fluctuates daily in response to his or her boss's behavior that day) correlations and between-person level (e.g., employees of abusive supervision have lower engagement than employees of positive leadership) correlations (McCormick, Reeves, Downes, Li, & Ilies, 2020). Transformational leadership showed stronger mean corrected correlations for between-person level correlations ($k = 98, \rho = .460$, 95% CI [.417, .503]) than for within-person level correlations ($k = 5, \rho = .315$, 95% CI [.126, .504]), but the difference was not significant ($t = 2.146, p = .143$). Interestingly, for abusive supervision, the mean corrected correlation was stronger for within-person level studies ($k = 3, \rho = -.268$, 95% CI [-.509, -.028]) than for between-person level studies ($k = 8, \rho = -.252$, 95% CI [-.307, -.197]), but the difference was not significant ($t = 0.017, p = .895$).

Table 5. *Meta-Analysis Results for Leadership and Employee Engagement: the Role of Study design*

Leadership	Subgroup	k	ρ	SE ρ	95%CI		Q	I ²	t	p
					Lower	Upper				
Transformational	Cross-sectional	90	.459	.023	.414	.503	1308.22	.93	0.487	.485
	Longitudinal	6	.404	.075	.257	.551	131.919	.96		
Authentic	Cross-sectional	42	.455	.030	.396	.514	526.618	.92	0.178	.673
	Longitudinal	3	.389	.154	.087	.691	38.6415	.95		
Ethical	Cross-sectional	15	.571	.061	.452	.69	246.09	.94	8.063**	.005
	Longitudinal	8	.354	.046	.264	.445	41.1839	.83		
Servant	Cross-sectional	9	.417	.052	.315	.518	46.4211	.83	5.115*	.024
	Longitudinal	17	.570	.041	.49	.65	120.01	.87		

Note: *, $p < .05$; **, $p < .01$; k = number of independent samples included. ρ = correlation for population estimate corrected for attenuation due to sampling error variance; SE ρ = standard error for population estimate; I² is an index of heterogeneity computed as the percentage of variability in effects sizes that are due to true differences among the studies; Q provides information on whether there is statistically significant heterogeneity (i.e., yes or no heterogeneity).

Measurement of engagement and leadership. Transformational leadership ($t = 4.055, p = .044$) showed stronger mean corrected correlations for studies using other measurements of work engagement ($k = 20, \rho = .535$) than UWES ($k = 78, \rho = .442$). Authentic ($t = 2.244, p = .134$), ethical ($t = 1.900, p = .168$), servant leadership ($t = 3.100, p = .078$), transactional leadership ($t = 0.702, p = .402$) and employee engagement showed no significant mean corrected correlations difference for other measures ($\rho = .543, .370, .648, .237$) than for the UWES ($\rho = .436, .514, .499, .310$, respectively) (see Table 6). Finally, regarding the moderation effect of rating sources on the relationship between transformational leadership and employee engagement, the results showed that the effect size was stronger for employee perceived transformational leadership ($k = 95, \rho = .470, 95\% \text{ CI } [.427, .513]$) than for leader-reported ($k = 3, \rho = .154, 95\% \text{ CI } [-.117, .425]$), $t = 5.10, p = .023$.

Table 6. *Meta-Analysis Results for Leadership and Employee Engagement: The Role of Measurement of Engagement*

Leadership	Subgroup	k	ρ	SE ρ	95%CI		Q	I ²	t	p
					Lower	Upper				
Transformational	UWES	78	.442	.026	.391	.492	1221.23	.94	4.055*	.044
	Others	20	.535	.039	.459	.611	199.121	.90		
Authentic	UWES	39	.436	.032	.373	.499	514.985	.93	2.244	.134
	Others	6	.543	.063	.418	.667	42.7477	.88		
Ethical	UWES	19	.514	.055	.406	.621	357.245	.95	1.900	.168
	Others	3	.370	.089	.196	.544	13.6491	.85		
Servant	UWES	23	.499	.037	.426	.572	189.472	.88	3.100†	.078
	Others	3	.648	.076	.499	.797	7.2796	.73		
Trasactional	UWES	15	.310	.030	.251	.368	48.9366	.71	0.702	.402
	Others	8	.237	.081	.078	.396	86.1617	.92		

Note: for subgroup sample size < 3, we did not test the subgroup analysis. †, $p < .10$, *, $p < .05$; UWES = Utrecht work engagement scale; k = number of independent samples included. ρ = correlation for population estimate corrected for attenuation due to sampling error variance; SE ρ = standard error for population estimate; I² is an index of heterogeneity computed as the percentage of variability in effects sizes that are due to true differences among the studies; Q provides information on whether there is statistically significant heterogeneity (i.e., yes or no heterogeneity).

Sensitivity Analyses and Diagnostics

The sensitivity analyses revealed that after removing outliers (i.e., the study's confidence interval does not overlap with the confidence interval of the pooled effect, Harrer et al., 2019), most results did not differ much from the overall meta-results (see Table 2). However, the I^2 (i.e., total heterogeneity/total variability) has been decreased, with mostly below the 75% described in Hunter and Schmidt (2004). Specifically, we found positive correlations between employee engagement and leadership styles of transformational (with 28 studies removed, $k = 72$, $\rho = .432$, $I^2 = 42.39\%$), authentic (with 16 studies removed, $k = 30$, $\rho = .414$, $I^2 = 68.69\%$), ethical (with 8 studies removed, $k = 15$, $\rho = .426$, $I^2 = 63.77\%$), servant (with 8 studies removed, $k = 18$, $\rho = .462$, $I^2 = 52.92\%$), empowering (with 2 studies removed, $k = 8$, $\rho = .469$, $I^2 = 86.11\%$), charismatic (with 1 study removed, $k = 3$, $\rho = .455$, $I^2 = 17.89\%$), engaging (with 1 studies removed, $k = 5$, $\rho = .345$, $I^2 = 46.23\%$), and transactional (with 4 studies removed, $k = 19$, $\rho = .266$, $I^2 = 45.13\%$). Lastly, the effect sizes of follower-perceived abusive supervision with employee engagement was same ($k = 9$, $\rho = -.233$).

Publication Bias

A common issue that has been discussed in meta-analysis research is the file-drawer or publication bias problem, which assumes that a study with a low effect size is less likely to be published than a study with high effect sizes (Harrer et al., 2019; Rosenthal, 1979). To examine this kind of bias, we used funnel plot, Eggers test, and trim-and fill approach. For seven leadership styles included in our study (publication bias analysis were not conducted for engaging leadership and charismatic leadership due to small sample size), the funnel plots show that effect sizes in our review are symmetrically distributed around the aggregated effect size (see online supplementary Appendix D), suggesting that publication bias issue is not severe (Card, 2012). Since the funnel plot only provides a subjective assessment of

publication bias, we further used Egger, Smith, Schneider, and Minder's (1997) regression test. Specifically, the p -value of Egger's test was statistically not significant (for leadership styles of transformational, $k = 100$, $t = -0.47$, $p = .636$; authentic, $k = 46$, $t = -0.709$, $p = .482$; servant, $k = 26$, $t = -0.007$, $p = .994$; abusive, $k = 9$, $t = 0.174$, $p = .867$; transactional, $k = 23$, $t = -0.988$, $p = .334$; empowering, $k = 10$, $t = -2.129$, $p = .07$; for an exception is ethical leadership, $k = 23$, $t = -0.231$, $p = .031$). We should be cautious to interpret Egger's results when the number of studies is small (i.e., $k < 10$). Finally, we used Duval's (2005) trim and fill method. A test of the null hypothesis that the number of missing studies (on the chosen side) is zero was retained only for servant leadership. The adjusted effect size for servant leadership was same as the overall pooled effect size (see Table 2). However, for transformational leadership (with 11 added studies, $k = 111$, adjusted $\rho = .468$, 95% CI [.429, .505]), authentic (with 10 added studies, $k = 56$, adjusted $\rho = .471$, 95% CI [.424, .516]), ethical leadership (with 8 added studies, $k = 31$, adjusted $\rho = .558$, 95% CI [.479, .627]), abusive supervision (with 1 added studies, $k = 10$, adjusted $\rho = -.244$, 95% CI [-.296, -.191]), transactional leadership (with 7 added studies, $k = 30$, adjusted $\rho = .343$, 95% CI [.275, .408]), and empowering leadership (with 4 added studies, $k = 14$, adjusted $\rho = .571$, 95% CI [.455, .669]), the trim-and-fill procedure shows that our initial results were underestimated due to publication bias, and the "true" effect when controlling for selective publication might be higher than the original pooled effect sizes.

Recently, researchers argued that publication bias is mostly due to P -hacking (i.e., by selectively removing outliers, choosing different outcomes, controlling for different variables, researchers make a non-significant finding becoming significant, Harrer et al., 2019). A model selection method called P -Curve has been suggested to examine such a publication bias (McShane, Böckenholt, & Hansen, 2016). Accordingly, using the R package "dmetar" (Harrer et al., 2019) we tested such kind of publication bias. The results showed that our

meta-analysis has a quite high power estimation. Specifically, for leadership styles of transformational ($k = 96$, 96% included, power estimate is 99% (95% CI: 99%-99%), authentic ($k = 46$, 100% included, power estimate is 99% (95% CI: 99%-99%), ethical ($k = 23$, 100% included, power estimate is 99% (95% CI: 99%-99%), servant ($k = 26$, 100% included, power estimate is 99% (95% CI: 99%-99%), abusive ($k = 9$, 100% included, power estimate is 97% (95% CI: 90%-99%), transactional ($k = 20$, 86.96% included, power estimate is 99% (95% CI: 99%-99%), and empowering ($k = 9$, 90% included, power estimate is 99% (95% CI: 99%-99%). These results suggest that for the leadership styles included in our study evidential values are present and that they are not absent or inadequate, so the *P*-Curve estimates that there is a “true” effect size behind our findings, and that the results are not the product of publication bias and *P*-hacking alone. The “true effect sizes” for authentic, ethical, servant, empowering, and abusive supervision were the same as the initial pooled effect sizes, because all studies were included when we estimate the *p*-hacking bias. To estimate the “true effect sizes” for transformational and transactional leadership, we used the Hedges (1984) model selection method, as McShane et al. (2016) found that the original Hedges approach performed better than *P*-Curve and *P*-uniform approaches in more realistic settings. The Hedges (1984) adjusted effect sizes showed that for transactional leadership ($\rho = .306$, 95% CI: .231, .380) the adjusted effect sizes were higher than the initial pooled effect sizes, whereas they were lower for transformational leadership ($\rho = .429$, 95% CI: .360, .499). Because the Hedges (1984) and trim-and-fill approaches are based on different assumptions about publication bias (i.e., small sample bias and *p*-hacking bias), the results were not exactly consistent, and therefore we reported both results (Harrer et al., 2019). Although using conventional tests we find no severe publication bias, we cannot rule out this possibility. Most of the primary field studies we included are endogeneity plagued, which may increase the likelihood of any result, both published and unpublished, to be statistically significant. Thus,

no method, even p-curving, will be able to detect this bias. Again, one should be cautious in interpreting the publication bias results when the number of studies is small (i.e., $k < 15$; Kepes, Banks, & Oh, 2014).

Discussion

This study aimed to examine how the leadership–employee engagement relationship varies across national cultures. The results showed that 10 out of 56 national cultures \times leadership styles moderating effects were significant, which to some extent supports the claim that leadership is culturally contingent (House et al., 2004). Specifically, the leadership–employee engagement relationship is stronger in countries high on future orientation (for ethical leadership and empowering leadership), and low on uncertainty avoidance (servant leadership).

Although we found other significant moderating effects of national culture as well, most of these went against our hypotheses. Specifically, contrary to national culture-based logic, the leadership–employee engagement relation was stronger in countries low on gender egalitarianism (for transformational and empowering leadership), low on human orientation (empowering leadership), low on performance orientation (for transformational and authentic leadership), high on power distance (for authentic leadership). Similarly, Rabl and colleagues (2014) found that the high performance work system (HPWs)-business performance relationship was more strongly positive in high power distance countries. The moderating effect of assertiveness was not supported. To some extent, these results are in line with previous meta-analytic results that on average, HPWS do not work better when they fit the national culture (Rabl et al., 2014). Similarly, Rockstuhl et al. (2012) found that national culture did not affect the relationships between leader-member exchange with task performance and organizational commitment.

Further, the results indicated that the relationship between abusive supervision and employee engagement is stronger in countries high on human orientation. Whereas Zhang and Liao (2015) found that power distance moderates the relationships between abusive supervision and subordinates' performance, we did not replicate this effect for engagement. One explanation is that the influence of culture may depend on the study outcomes (cf. Lian et al., 2012, who found that whether power distance exacerbated or mitigated the effect of abusive supervision depended on the outcome).

Third, our results suggest that in general, the national cultural factor does *not* constrain the correlations of transactional leadership, ethical leadership, and servant leadership with subordinates' work engagement. The relationship between ethical, servant, and transactional leadership and employee engagement appears to be stable across national cultural factors (compared to transformational, authentic, and empowering leadership). These results are in line with the cultural universal argument. For instance, previous studies compared leadership in Western and Asian countries and showed cultural universality for supportive (e.g., servant), and contingent reward (e.g., transactional) leader behaviors (Dorfman et al., 1997). Interestingly, while House et al. (2004) found that the effects of transformational leadership did not depend on culture, in our study we found that the relation between transformational leadership and employee engagement was stronger in countries low on gender egalitarianism and low on performance orientation. Thus, these results supported both the cultural contingency and cultural universal arguments.

Finally, although our study includes more than 209 studies involving 45 countries, the hypothesized interaction effects between national culture and cultural tightness-looseness were not supported. Out of 56 interactions, we did not find any significant interaction effect. These results are not in line with previous meta-analytic studies. For instance, Taras and colleagues (2010) found that cultural values have significantly stronger effects on outcomes in

culturally tighter countries than in looser countries. Similarly, Rabl and colleagues (2014) found that in tight cultures, the relationship between HPWS and business performance was more positive in national cultures that were relatively low on power distance and/or high on performance orientation (for similar findings see Liu, Jiang, Shalley, Keem, & Zhou, 2016). However, our results did not replicate these interaction effects on engagement. A tentative explanation is that both national cultural values and cultural tightness–looseness scores (Gelfand et al., 2011) were taken from other studies and matched with the data in our meta-analytic data set, which is a conservative way to test these interaction effects. Taken together, our findings indicate that the relationship between national culture and leadership–employee engagement is more complex and nuanced than suggested in the literature, as it varies not only with leadership style but also with national culture.

Implications for Leadership and Employee Engagement Research

Our study contributes to the leadership literature by systematically investigating how different leadership styles relate to employee engagement. Although the findings that leadership styles that are typically considered ‘positive’ (e.g., ethical and servant leadership) are positively associated with employee engagement while abusive supervision was negatively related to employee engagement may not be surprising, this further emphasizes the importance of leadership in the workplace. Importantly, we comprehensively examined how national culture relates to the leadership–employee engagement relationship. The results supported both the cultural contingency and cultural universality arguments, in that the leadership–employee engagement correlations in some cases depend on national cultural characteristics (e.g., human orientation, gender egalitarianism, and UA), whereas the correlations between ethical, servant, transactional leadership and employee engagement appear to be stable across national cultural factors. Finally, the current study supports recent calls from researchers to incorporate a wider array of cultural values beyond individualism–collectivism to understand how cultural

values work (Gelfand, Leslie, & Fehr, 2008). Accordingly, we have offered some initial evidence showing that for leadership, not only collectivism and power distance, but also gender egalitarianism (2/7 significant interactions), future orientation (2/8 significant interactions), and performance orientation (2/8 significant interactions) are important cultural dimensions (for a summary see Table 3). Although we used the permutation tests to control the risk of spurious findings from meta-regression as suggested by Higgins and Thompson (2004), note that the significant findings reported here were not Bonferroni corrected for multiple testing. After Bonferroni adjustment of the alpha level (i.e., $p = .00089$), none of our tested interactions were significant, meaning that there is a risk of increased Type I error in our findings. Future investigations are necessary to validate the results that were found in our meta-analysis. In addition, our meta-analysis is limited by including only studies written in English, which is especially problematic when focusing on country differences. Future research can apply a multi-language meta-analysis when comparing leadership effectiveness across countries (e.g., Hiller, Sin, Ponnappalli, & Ozgen, 2019).

Finally, the majority of studies included in our meta-analysis are based on traditional survey data with cross-sectional research designs (79%), which has a strong potential of endogeneity bias in their findings and makes it difficult to conclude any causal relationships between leadership and employee engagement. We strongly recommend and believe that future research should pay more attention to the endogeneity issues in research models and try to address this issue in research designs. Below, we provide a research agenda for future research, with a special emphasis on various methodological issues. We hope this could shed some light for researchers about how to better advance studies on the relationship between leadership and employee outcomes in the future.

Recommendations for Future Research

Study designs. Although we conducted an exhaustive search for relevant studies, we are disappointed that we found only one experimental study among working populations (Kovjanic, Schuh, & Jonas, 2013), and the majority of articles included in this meta-analysis employed a cross-sectional design (i.e., 79%); excluding nine experience sampling designs, most “longitudinal designs” are time-lagged measurement designs (the mean time lag is 8.47 weeks, and 19/30 used time intervals within one month) with only one used repeated measurement (i.e., Nikolova et al., 2019), which might lead to endogeneity bias and that precludes drawing strong causal inferences (Antonakis, Bendahan, Jacquart, & Lalive, 2010). Endogeneity bias refers to an instance when a predictor variable (whether categorized as an independent variable, mediator, or moderator) is associated with the error term of the outcome variable (Antonakis et al., 2010). Therefore, an important direction for future research on leadership and employee engagement is to advance causal identification.

Several strategies have been identified to improve causal identification. For instance, better measures, data and sample, and statistical approaches (for a review see Shaver, 2019). In the current study, we highlight two ways that have often been proposed to deal with the issue of endogeneity and make valid causal inferences possible: experimental designs and the use of instrumental variables (Antonakis et al., 2010; Fischer, Dietz, & Antonakis, 2017). One obvious reason for the use of experimental designs is that they can provide evidence for causality (Podsakoff & Podsakoff, 2019). The logic of an experiment is that the origin of the change in the dependent variable (e.g., work engagement) stems from only the manipulated variable (i.e., leadership) (Antonakis et al., 2010). When designing an experiment, the randomized experiment is always the golden standard, in which several issues need to be carefully considered by researchers: manipulation check, control group, sample size, and ethical issues (for other recommendations for conducting experimental research, see Eden,

2017; Lonati, Quiroga, Zehnder, & Antonakis, 2018). Below, we explain these issues in detail.

Manipulation check. When conducting an experimental study in the laboratory, one must make sure that “the manipulations of leadership phenomena are valid, representative, fair, and powerful enough to produce the intended effects” (Podsakoff & Podsakoff, 2019). This is because manipulation checks can minimize the risk of “demand effects”, which refers to “changes in behavior by experimental subjects due to cues about what constitutes appropriate behavior” (Zizzo, 2010). Studies on abusive supervision (e.g., Porath & Erez, 2007), servant leadership (Podsakoff, Podsakoff, MacKenzie, & Klinger, 2013), charismatic (Howell & Frost, 1989), and transformational leadership (Kovjanic et al., 2013) provide insights into how successfully manipulating leadership in an experimental setting could be conducted. For example, researchers have used video (Podsakoff et al., 2013), and pen and paper methods (Van Dierendonck, Stam, Boersma, De Windt, & Alkema, 2014) to manipulate servant leadership (Eva, Robin, Sendjaya, van Dierendonck, & Liden, 2019).

Control group. When conducting an experiment, researchers should always consider adding a control group and randomly assign participants to a control group or an experimental group. Makin and de Xivry (2019) listed the “absence of an adequate control condition/group” to assess the effect of intervention (or manipulation) as one of the ten common statistical mistakes. This is because changes in outcome measures can be caused by other elements of the study that do not directly relate to the manipulation. Therefore, for any experimental studies in the future that intends to examine the effect of a leadership manipulation on employee outcomes, it is crucial to compare the effect of this experimental manipulation with the effect of a control condition (e.g., transformational leadership (TFL) versus non-TFL; Kovjanic et al., 2013).

Sample size. It is also important to have enough respondents for detecting the desired effect. With a small sample size, the effect size of the false positives is large and it is also more susceptible to missing an effect that exists in the data (Type II error) (Makin & de Xivry, 2019). Hence, for leadership research with large samples, researchers can reduce the possibility of not detecting an influence when in fact leadership has an influence on outcomes. Accordingly, Makin and de Xivry (2019) proposed two suggestions: (a) present evidence that a study has sufficient power to detect an effect (e.g., a priori power analysis); (b) or perform a replication of study.

Ethical issues. Finally, when conducting an experiment, ethical issues should always be considered for treating human participants. Especially, researchers should “minimize ethical concerns about harm to participants, inequity, paternalism, and deception” (Podsakoff & Podsakoff, 2019). The study should be approved by the local Ethical Committee and in accordance with some general guidelines (e.g., APA’s Ethical Principles of Psychologists and Code of Conduct, American Psychological Association, 2010).

A second way to combat the endogeneity issue is to use instrumental variable estimation (Maydeu-Olivares, Shi, & Fairchild, 2020). The underlying idea is that using only the exogenous part of the variation in the independent variable x (the part not associated with the error term e) to estimate its effect on the dependent variable y (Sajons, 2020). Specifically, cross-sectional and longitudinal field studies could be extended with instrumental variable models (IVs, that is, another variable z which causes variation in x , but which is not influenced by simultaneity or omitted variables, Sajons, 2020) to separate the effects of the endogenous variable from method bias (see Antonakis et al., 2010; Daryanto, 2020, for a tutorial in SPSS; Sajons, 2020, for technical details). Typically, stable individual differences such as demographic information, personality, and cognitive ability could be used as instrumental variables (Antonakis et al., 2010; Hughes, Lee, Tian, Newman, & Legood,

2018). Larcker and Rusticus (2010) suggested that cognitive ability is more suitable as an instrumental variable than personality (Hughes et al., 2018).

In addition to using instrumental variable estimation, stronger survey designs should be employed which allows us for causal identification (Shaver, 2019). A strong reliance on cross-sectional designs and self-report within the leadership – employee engagement research has impeded us to draw meaningful causality conclusions from these findings. Especially, none of these articles has dealt with the endogeneity issue within their design. This issue in leadership studies has been raised by several researchers (e.g., Antonakis et al., 2010; Eva et al., 2019; Shaver, 2019). Therefore, future research should employ stronger survey designs. For instance, using longitudinal designs to investigate possible reverse causation between leadership and its subordinate-related “outcomes”, because leader behaviors and employee reactions might mutually affect each other (Kim et al., 2018; Nielsen & Taris, 2019). We consistently found that concurrent study designs result in stronger correlations than time-lagged designs (exceptions are servant leadership and abusive supervision). Similar results were reported by Christian et al. (2011) who found that longitudinal studies usually reported lower correlations than cross-sectional studies. However, it is possible that the influence between variables may be reversed or even reciprocal. We thus recommend leadership researchers to employ longitudinal designs (and use instrumental variable models) in their research in order to test the causal direction (e.g., Nikolova et al., 2019).

Measurement of leadership and employee engagement. Our subgroup analysis showed that the correlation between transformational leadership and employee engagement was weaker when leader-reported scores were used to measure leadership styles than if employee perceptions of leadership were used, but the moderation test showed no significant difference. To some extent this agrees with Kim et al. (2018) who reported that the association between leadership and contextual performance was stronger for self-reported

than for other-reported criteria. Future research can use multisource ratings of leadership and investigate whether “a seeing eye in eye effect” (Matta, Scott, Koopman, & Conlon, 2015) influences employee engagement.

Measurement of cultural values. Although we examined the effects of national culture on leadership and employee engagement relations, these cultural values were not directly assessed in the studies included in this meta-analysis. This approach might underestimate the true relationship between culture and leadership–employee engagement relationships (Rockstuhl et al., 2012). Echoing Rockstuhl et al.’s recommendation, future research should consider including subordinates’ cultural values and test whether effects at the individual level are similar to what we found at the national level. This especially applies to the tightness-looseness dimension. Several meta-analyses (Rabl et al., 2014; Taras et al., 2010) and empirical studies (e.g., Aktas, Gelfand, & Hanges, 2016) have demonstrated the merits of including this dimension, but in our study we did not find the hypothesized interaction effects. Therefore, more empirical studies are needed in future research. It should be noted some moderation analyses of national culture in our study were based on small sample sizes. Thus, we should be cautious in interpreting these results as Type-I errors are likely to occur when using 15 or fewer studies in a meta-analysis (Field, 2001). Only one article we reviewed has included samples from multiple countries (i.e., Rahmadani, Schaufeli, Ivanova, & Osin, 2019). Future leadership research could try to include multiple national samples within the same study, and to include different cultural dimensions that may help clarify the effectiveness of leadership across cultures (Dickson, Castaño, Magomaeva, & Den Hartog, 2012).

In summary, we offer three overall suggestions for future leadership – employee engagement research regarding the research design and measurement in Table 7.

Practical Implications

From a practical perspective, our findings offer a guide for practitioners to better understand how different leadership styles relate to employee engagement. Consistent with previous research (e.g., Hoch et al., 2016), our study confirms the positive association of employing positive leadership styles and employee engagement, and a negative association of abusive supervision and employee engagement across cultures. The strongest relations with engagement were found for servant leadership, ethical, and empowering leadership. Managers who wish to increase employee engagement may consider to broadcast these positive leadership styles and avoid abusive supervision behaviors. Note that our results cannot be interpreted as causal due to the fact that the included studies suffer from endogeneity bias.

Table 7. *Suggestions for Future Leadership and Employee Engagement Designs*

<ol style="list-style-type: none"> 1. Where it possible, using randomized experiment to establish causality. <ol style="list-style-type: none"> a. Adding a control group and randomly assign participants to the manipulation group or control group. b. Sample size: present evidence that a study has sufficient power to detect an effect (e.g., a priori-power analysis) or perform a replication of study. c. In addition to use students employees to conduct laboratory study, researchers are encouraged to conduct more field experiments and using work populations as participants (Antonakis, Bastardo, Jacquart, & Shamir, 2016). d. Always test whether manipulation of leadership works (preferably with external samples, Loanti et al., 2018) to minimize “demand effects”. For an example of video manipulation of servant leadership, see Podsakoff et al. (2013). e. Ethical issues (“Minimizes ethical concerns about harm to participants, inequity, paternalism, and deception”, Podsakoff & Podsakoff, 2019)

<ol style="list-style-type: none"> 2. If employing a survey design: <ol style="list-style-type: none"> a. Using instrumental variable models (e.g., cognitive ability) for leadership study to combat endogeneity bias. b. Employing panel designs (or intensive longitudinal designs) such as the experience sampling method. c. Using validated measurement of leadership.

<ol style="list-style-type: none"> 3. When considering country difference of leadership effectiveness. <ol style="list-style-type: none"> a. Directly measure cultural values of participants (e.g., cultural tightness-looseness). b. Including participants from multiple countries.
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Notably, our results indicate that servant, transactional, and ethical leadership are desirable, independent from the cultural context. Especially the correlations with employee

engagement are relatively stable when accounting for other national cultural variables. Insofar as current findings on the positive associations between leadership styles and employee engagement, this suggests that organizations aiming to enhance employee engagement *may* benefit from developing leadership training programs (Knight, Patterson, & Dawson, 2017) to promote servant and ethical leader behaviors.

In addition, our findings highlight the role of cultural differences in the relationships between some leadership styles (e.g., transformational leadership, authentic leadership, empowering leadership, and abusive supervision) and employee engagement in different cultural contexts. To improve cultural fit, leaders may consider a country's national culture (House et al., 2004) when making decisions or when interacting with employees from different cultural backgrounds.

Accordingly, leadership development programs (especially for those who work in a multi-cultural context) would benefit from integrating leader, follower, and national characteristics (Aktas et al., 2016; Padilla, Hogan, & Kaiser, 2007). When designing a training program, managers need to consider what kind of national culture a new leader will be going to work and make sure that leadership is contingent on employees' cultural values. Especially, they should use the knowledge that national culture and leadership styles jointly affect some leadership–employee engagement relationships (e.g., the empowering – employee engagement relationship is more strongly positive for national cultures with a low performance orientation); a greater focus on ethical standards and followers (i.e., ethical and servant leadership, Hoch et al., 2016) in leadership training and education is not a guarantee, but it could promote employee engagement as these two leadership styles are desirable globally. However, causal assertions are not warranted since the current review is mainly based on cross-sectional studies.

Conclusion

Researchers as well as practitioners have since long argued that leadership affects employee functioning, including their levels of engagement. The present study confirmed the assumed positive relationship between several leadership styles and employee engagement. An investigation of the moderating effects of national culture revealed that culture may moderate the leadership–employee engagement relationship, whereas leadership styles like servant leadership and ethical leadership are seen as desirable everywhere (i.e., the relationship does not vary across cultural factors). And the negative correlation between abusive supervision and work engagement seems less likely to be influenced by national cultural characteristics (1/8 significant interaction). Thus, our study supports both culture consistency and cultural contingency for leadership effectiveness. Since most of the included studies in this meta-analysis were cross-sectional, the methodology of leadership–employee engagement research needs to be improved to strengthen the plausibility of causal claims regarding the effects of leadership; especially experimental designs should be conducted in the future.

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Chapter 7

Creative Performance Pressure as a Double-Edged Sword for Creativity: The Role of Appraisals and Resources

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Abstract

Creativity, or the production of novel and useful ideas or products, is widely viewed as the cornerstone of organizational innovation and success. However, high pressure to be creative may have mixed implications for employee creativity. In this article we first systematically conceptualize the nature of the concept of creative performance pressure. Next, building on transactional stress theory, we investigate (a) how creative performance pressure influences employee creativity through different appraisals (i.e., challenge and hindrance) and (b) the moderating role of a job and personal resource (i.e., servant leadership and promotion focus) in the stressor appraisal process. In Study 1 we developed a creative performance pressure scale, and assessed its psychometric properties across two samples ($N = 181$ for Sample 1; $N = 253$ for Sample 2). In addition, using three-wave, multi-source data (Study 2), we tested our hypotheses in a Chinese sample ($N = 225$). The results demonstrated that creative performance pressure can have both positive and negative effects on employee creativity through challenge and hindrance appraisals, respectively. Servant leadership moderated the effect of creative performance pressure on challenge and hindrance appraisals, by transmitting the beneficial and detrimental effects of creative performance pressure to creativity, respectively. Similarly, promotion focus moderated the relationship between creative performance pressure and hindrance appraisal. Implications for future research and practice are discussed.

Keywords: creative performance pressure, challenge appraisal, hindrance appraisal, creativity, servant leadership, promotion focus

Introduction

The changing world and the uncertain labor market spark huge pressure for generating novel and useful ideas concerning organizational products, practices, services, or procedures (Anderson, Potočnik, & Zhou, 2014; Hoever, Zhou, & van Knippenberg, 2018). In particular, the unexpected global health emergency caused by the Covid-19 virus is reshaping nearly all aspects of social life and stimulates organizations to take more innovative efforts to survive. For example, home building companies need to rapidly upgrade housing technology to meet the requirements of cleanliness and safety (Olick, 2020). Fashion retailers are seeking tech platforms and more creative ways to sell products online (Handley, 2020). As a result, organizations increasingly rely on the utilization of novel approaches to improve their organizational outcomes (Malik, Butt, & Choi, 2015), and consequently, employees may feel pressure to increase their creative performance.

Building on the previous concept of performance pressure (Mitchell, Greenbaum, Vogel, Mawritz, & Keating, 2019), we define creative performance pressure as the urgency to achieve high levels of creative performance because being creative (or not) has substantial consequences for the employee and the organization s/he works for. High pressure for creative performance conveys the information that creativity is valued and needed and creates opportunities for employees to acquire recognition or appreciation, respect and personal development by generating and expressing new ideas (F. Li, Deng, Leung, & Zhao, 2017). At the same time, since high creative performance may require a high investment of resources to transform, develop and refine new ideas that are not certain to reap benefits and may even be perceived as weird, inappropriate, unworkable, or too risky (Mainemelis, 2010; Staw, 1995), the pressure of raising creative performance may trigger unfavorable outcomes as well. Arguably, creative performance pressure can be viewed as a significant potential work

stressor for employees. In general, research suggests that the relationship between work stressors and creativity is not universally positive or negative (for a review, Gutnick, Walter, Nijstad, & De Dreu, 2012). Results have been mixed, with studies showing positive (e.g., Ohly & Fritz, 2010), negative (e.g., Shalley & Perry-Smith, 2001), as well as curvilinear relationships (e.g., Baer & Oldham, 2006; Byron, Khazanchi, & Nazarian, 2010) between work stressors and creativity. Gutnick et al. (2012) call for in-depth research to explore why and how work pressure impacts employees' creative performance. In addition, Sessions, Nahrgang, Newton, and Chamberlin (2020) also highlight the importance of considering the nature of stressors when exploring their functional or dysfunctional effects. Thus, it is important to know how creative performance pressure matters in facilitating or inhibiting creativity: What are the mechanisms linking creative performance pressure to creativity, and what conditions can strengthen or weaken this relationship?

Building on the transactional stress theory (Lazarus & Folkman, 1984) and the challenge-hindrance stressor framework (Cavanaugh, Boswell, Roehling, & Boudreau, 2000), the current study argues that *appraisal* serves as a mediator between work stressors (i.e., creative performance pressure) and creativity. Specifically, we assert that creative performance pressure, as a special type of work stressor that is associated with both beneficial outcomes (e.g., promotions, raises and resources) and harmful outcomes (e.g., failures and risks), can elicit different appraisal processes (i.e. as a challenge vs. a hindrance; Cavanaugh et al., 2000; Li, Taris, & Peeters, 2020; Searle & Auton, 2015). In turn, employees' appraisal of creative performance pressure as a challenge or a hindrance will have beneficial or detrimental effects on employee creativity, respectively.

In addition, the transactional stress theory states that cognitive appraisals of stressors depend not only on the nature of the work stressor, but also hinges on the resources that are available (Lazarus & Folkman, 1984). These resources can be personal or social aspects that

are functional for achieving one's work goals or coping with work stressors (Bakker & Demerouti, 2017). In the present study we therefore propose that employees' appraisal of creative performance pressure may vary depending on job resources (servant leadership) and individual resources (promotion focus). We choose servant leadership as an important job resource that can moderate the relationship between creative performance pressure and cognitive appraisals because compared to other more top-down leadership approaches (e.g., transformational leadership), servant leaders lead from the bottom and emphasize on promoting the growth and development of employees (Van Dierendonck, 2011) even in times of crisis (i.e., COVID-19, Hu, He, & Zhou, 2020). Moreover, servant leaders understand the concerns and worries of followers and prioritize their needs (Eva, Robin, Sendjaya, van Dierendonck, & Liden, 2019; Greenleaf, 1977). Finally, a meta-analysis showed that when predicting employee outcomes, servant leadership explained important incremental variance beyond other types of leadership (Hoch, Bommer, Dulebohn, & Wu, 2016). Thus, servant leaders can provide the resources that employees need to promote challenge appraisals of creative performance pressure.

In addition, we examine promotion focus as an important individual resource that regulates the relationship between creative performance pressure and challenge/hindrance appraisal because promotion focus is associated with aspirations, gain maximization, approach-oriented goal pursuit, and high activation of positive emotions (Koopmann et al., 2019). Different from other personal factors such as openness to experience, promotion focus is more proximal in influencing work-related cognitions (Lanaj, Chang, & Johnson, 2012) and allowed individuals more easily to recognize creative ideas (Zhou, Wang, Song, & Wu, 2017). Moreover, as noted earlier, how individuals appraise creative performance pressure can be determined by their attention to certain features of the pressure. Promotion focus can affect whether and to what extent an employee is oriented toward "growth and development,

or opportunity” (Higgins & Tykocinski, 1992), which may alter the way to appraise creative performance pressure.

Our study contributes to the literature in three ways. First, we introduce a new construct, creative performance pressure, into the realm of creativity research and explore its influence on creativity. We also develop a creative performance pressure scale and validate its psychometric properties in different samples. Prior studies have focused on how work stressors such as time pressure (Baer & Oldham, 2006; Ohly & Fritz, 2010), creativity-based pay (F. Li et al., 2017; F. Li, Chen, & Lai, 2018), and performance evaluation (i.e., social-evaluative threats, Byron et al., 2010) influence creativity. However, the impact of creative performance pressure, as a unique work stressor, on creativity has not directly been examined yet. This is surprising, since achieving high creative performance has been widely viewed as the cornerstone of organizational innovation and success in today’s economy (Anderson et al., 2014). Second, by explicitly considering challenge and hindrance appraisals as distinct mechanisms linking creative performance pressure to creativity, our work responds to calls from Gutnick et al. (2012) to explain the inconsistent findings regarding the relationship between work stressors and creativity and provides empirical evidence that creative performance pressure is potentially a double-edged sword. Third, by exploring servant leadership and promotion focus as two key boundary conditions of the effects of creative performance pressure, we offer a framework to understand when creative performance pressure promotes versus inhibits subordinate creativity. Our work thus offers a dialectical perspective in understanding the effects of creative performance pressure and sheds light on how to regulate the relationship between creative performance pressure and creativity.

Theoretical Development and Hypotheses

Different from work stress (which emphasizes the state when individuals perceive that demands in the work environment tax or exceed an individual's resources, Lazarus & Folkman, 1984), work stressors are factors or experiences that exert adaptation pressure on individuals, which may create high development opportunities or impede personal goals and well-being (Cavanaugh et al., 2000). Work stressors can be objective environmental factors (e.g., job demands) or subjective experiences of any factor or combination of factors that make individuals feel under pressure (e.g., role conflict) (Mitchell et al., 2019). They can be an activator of stress but do not necessarily lead to stress, since stress also depends on the available resources. In this article, we define creative performance pressure as the subjective experience of an urgency to achieve high levels of creative performance to attain desirable consequences and to avoid negative consequences. It is a unique type of work stressor that combines both positive and negative factors. Employees who experience such stressors believe that meeting high levels of creative performance can result in positive consequences such as personal growth and skill development (F. Li et al., 2017). Conversely, failing to strive for creative performance excellence may waste resources and can be perceived as inappropriate or incompetent (Mainemelis, 2010).

Creative performance pressure is conceptually distinct from a variety of related work stressors. First, it should be differentiated from the concept of creative requirements, as the former highlights the inherent substantial consequences and the subjective experience of tension or urgency to raise creative performance (Mitchell et al., 2019), whereas the latter highlights that jobs, teams or organizations need or require individuals to acquire knowledge and creativity or to undertake creative actions (Shalley, Gilson, & Blum, 2000; Unsworth & Clegg, 2010; Unsworth, Wall, & Carter, 2005). Second, creative performance pressure is also

different from routine performance pressure. Although both make employees experience urgency and pressure, routine performance pressure highlights the quantity of work or the effectiveness of performance activities (Madjar, Greenberg, & Chen, 2011), whereas creative performance pressure emphasizes the generation of new and original ideas (Amabile, 1996).

Creative performance pressure and Creativity

Transactional stress theory (Lazarus & Folkman, 1984) proposes that when encountering a work stressor, individuals first evaluate its meaning and significance to his/her well-being (Lazarus & Folkman, 1984). If the stressor is relevant, individuals will make appraisals to frame its meaning in relation to them. In particular, challenge appraisal involves the perception of stressors as an opportunity for mastery and goal achievement, whereas hindrance appraisal is the assessment of a workplace stressor as thwarting, inhibiting or limiting towards work goals (Searle & Auton, 2015). These two different appraisals of work stressors often affect work outcomes in opposite directions (Lazarus & Folkman, 1984).

Following this theory, we argue that appraisals can function as mechanisms underlying the association between creative performance pressure and creativity. On the one hand, creative performance pressure can be appraised as challenging, thus reflecting a psychological state focused on realizing potential gains or opportunities. This is because high creative performance pressure creates an opportunity for employees to excel or for personal growth (F. Li et al., 2018; Shin, Yuan, & Zhou, 2017). When successfully coping with this kind of stressor, employees will experience a sense of personal accomplishment and their achievements may bring favorable outcomes and breakthroughs to organizations (Staw, 1995). In addition, to achieve high creative performance, employees need to acquire new knowledge and develop their skills, which will provide opportunities for personal

development and learning at work (Prem, Ohly, Kubicek, & Korunka, 2017). Therefore, employees may appraise this pressure as challenging.

In addition, we expect that challenge appraisals of creative performance pressure stimulate creativity. Appraisals can influence employee outcomes through their impact on one's motivation, coping behaviors, as well as motivation (Prem et al., 2017). First, when creative performance pressure is appraised as challenging, employees are more likely to experience positive emotions (Skinner & Brewer, 2002), thus leading them to consider the generation of novel and useful ideas as an optimal, enjoyable experience (F. Li et al., 2018). Second, challenge appraisals are associated with an approach orientation (Schneider, Rivers, & Lyons, 2009), which facilitates a flexible and generative thinking style and motivates employees to engage in exploratory thoughts and novel directions (Gutnick et al., 2012). Similarly, challenge appraisal also increases problem-focused coping (LePine, Podsakoff, & LePine, 2005; Searle & Auton, 2015), which promotes individuals to learn more at work and thus leads to more creativity (Prem et al., 2017). Third, challenge appraisal is associated with motivation to work (i.e., energizing, directing, and maintenance of certain activities; Liu & Li, 2018). Therefore, we expect that creative performance pressure will have a positive effect on employee creativity if this pressure is appraised as a challenge.

On the other hand, creative performance pressure can also be appraised as a hindrance. This is because creative performance in the workplace is highly uncertain (Zhang, Liao, Li, & Colbert, 2020). In order to achieve high creative performance, employees need to process information and must transform, develop and refine this information into novel and useful ideas (Richard, Avery, Luksyte, Boncoeur, & Spitzmueller, 2019), which makes creative performance pressure taxing and difficult to overcome. In addition, these creative endeavors may well cost valuable resources, while not leading to benefits. For example, it is well

possible that new ideas are perceived as weird, inappropriate, unworkable, or too risky (Mainemelis, 2010). Moreover, the failure of creative endeavors may bring about negative consequences such as performance decline and job loss (Madjar et al., 2011). Even in contexts in which creativity is considered to be highly important, creative endeavors may still have unintended consequences. For example, Bromham, Dinnage, and Hua (2016) found that although interdisciplinary research is widely considered a hothouse for innovation, these highly novel research proposals might have lower funding success. Similarly, Boudreau, Guinan, Lakhani, and Riedl (2016) reported that evaluators might systematically give lower scores to research proposals involving highly novel research ideas. Thus, these potential difficulties and dark sides of creativity may focus an employee's attention on whether s/he can accomplish the performance goals and on the negative consequences of possible failure of creative endeavors.

Additionally, we expect that hindrance appraisals of creative performance pressure will harm employee creativity. As it related to low motivation, reduced coping effort and resources. Hindrance appraisals of creative performance pressure are likely to be related to low motivation to engage in creative processes because these employees are likely to believe that no reasonable level of effort will be adequate to meet these types of stressors. For example, prior studies showed that negative appraisals were associated with reduced control and increased escape coping (Fugate, Kinicki, & Prussia, 2008) and emotion-focused coping (e.g., F. Li et al., 2018). Moreover, any effort expended to cope with the stressors would likely be viewed as sapping resources that could otherwise be used for dealing with work stressors associated with valued outcomes that could be met (LePine et al., 2005, p. 765-766). In addition, hindrance appraisal of creative performance pressure also reduces the mental resources and cognitive capacity that should be allocated to creative processes (Byron et al.,

2010 for a review). Following this logic, we expect creative performance pressure to have a negative effect on employee creativity if this pressure is appraised as a hindrance.

Taken together, we argue that creative performance pressure may increase or decrease one's creativity through different appraisals. Challenge and hindrance appraisals will mediate the relationship between creative performance pressure and creativity. In line with our reasoning, prior empirical studies have shown that challenge and hindrance appraisals can function as major mechanisms linking work stressors and outcomes in opposite ways. For instance, challenge appraisals positively mediate the relationships between stressors and task performance (e.g., LePine, Zhang, Crawford, & Rich, 2016) and thriving at work (Prem et al., 2017). Conversely, hindrance appraisals negatively mediate the relationships between stressors and task performance (LePine et al., 2016). Therefore, we propose:

Hypothesis 1a. Challenge appraisals will positively mediate the relationship between creative performance pressure and creativity.

Hypothesis 1b. Hindrance appraisals will negatively mediate the relationship between creative performance pressure and creativity.

The Influence of Resources on the Stress Process

Creative performance pressure is characterized by the urgency to be creative. However, the transactional stress theory (Lazarus & Folkman, 1984) states that cognitive appraisal of a certain stressor depends on not only the nature of the stressor but also on the resources available to the employee to cope with the stressor (Gutnick et al., 2012). Resources embody both social and personal aspects and can help individuals cope with stressors (Bakker & Demerouti, 2017). Thus, we investigate how job resources (servant leadership) and personal

resources (promotion focus, taken as a trait) influence the relationship between creative performance pressure and appraisals.

The moderating influence of servant leadership. We propose that as a job resource, servant leadership will influence how one appraises and responds to creative performance pressure. In particular, a servant leader will provide social and emotional support in a stressful situation, thereby facilitating employee's challenge appraisal and mitigating their hindrance appraisal of creative performance pressure. The concept of servant leadership was introduced by Greenleaf (1977), who stated that servant leaders seek to develop followers first on the basis of their altruistic and ethical orientation. Different from other leadership behaviors (such as transformational leadership, which focuses on inspiring and encouraging followers to attain mission-focused ends), servant leaders emphasize the best interest of the follower, such as followers' individual growth and development (Mittal & Dorfman, 2012; Walumbwa, Hartnell, & Oke, 2010). Thus we argue that servant leadership is well suited for amplifying the positive appraisal of creative performance pressure.

Servant leaders prioritize individual members' personal growth and career development (Greenleaf, 1977) and provide employees with emotional resources (e.g., by exhibiting empathy and compassion and healing subordinates' emotional suffering; Barbuto & Wheeler, 2006) and organizational resources to deal with creative performance pressure. Specifically, by offering individuals developmental support (Chen, Zhu, & Zhou, 2015) and creating conditions that enhance follower's well-being (Van Dierendonck, 2011), servant leaders may have an impact on the appraisal of a stressor as challenging or hindering. Servant leader's support and resources enhance an individual's perception of the manageability of stressors (Roberts, Dunkle, & Haug, 1994), helping them to increase the confidence needed to deal with high creative performance pressure (Gutnick et al., 2012) and making them recognize its bright sides. In addition, servant leaders think highly of the recognition, acknowledgement

and realization of each person's abilities (Greenleaf, 1977) and often exhibit empathy and compassion when employees are confronted with difficulties (Barbuto & Wheeler, 2006). Through these processes, they can relieve employees' concerns about possible harmful consequences of the failure of creative endeavor and make them focus more on personal development. Thus, employees under high (rather than low) servant leadership are less likely to appraise creative performance pressure as a hindrance (i.e., an accentuating interaction effect); instead, they are more likely to appraise this pressure as challenging (i.e., a mitigating interaction effect, Gardner, Harris, Li, Kirkman, & Mathieu, 2017). Therefore, we propose:

Hypothesis 2a. Servant leadership moderates the positive relationship between creative performance pressure and challenge appraisals, such that the relationship becomes stronger when employees perceive their leaders as more serving.

Hypothesis 2b. Servant leadership moderates the positive relationship between creative performance pressure and hindrance appraisals, such that the relationship becomes weaker when employees perceive their leaders as more serving.

The moderating influence of promotion focus. We argue that as a personal resource, employee promotion focus, will influence to what extent creative performance pressure evokes different appraisals. The transactional stress theory states that personal factors like personal resources will shape the appraisals, in which they (a) determine what is salient for well-being in a given situation; and (b) provide the basis for evaluating potentially stressful situations (Lazarus & Folkman, 1984). Promotion focus can be treated as a stable individual trait that leads an individual to orientate towards ideals and achieve gains (Higgins, 1997; Sacramento, Fay, & West, 2013). It can influence an individual's appraisal of creative performance pressure since high-promotion focused individuals are more likely to notice the

potential benefits involved in creative performance pressure and to find resources helping them to address high creative performance pressure.

Research has shown that promotion-focused individuals prioritize success and higher levels of achievement and are growth-oriented in achievement striving (Higgins, 1997, 1998; Lockwood, Jordan, & Kunda, 2002). They experience elation when approach goals are met, and dejection when approach goals are not achieved, which fosters sensitivity to the presence or absence of positive outcomes (Higgins, 1997; Johnson, Chang, & Yang, 2010). This makes the potential growth and development involved in creative performance pressure more salient because high promotion-focused individuals are especially likely to notice and recall information relating to the pursuit of success and goals (Higgins & Tykocinski, 1992). In a related vein, high (rather than low) trait promotion focus individuals are likely to find strategies to deal with stressful situations, which provides a basis for them to evaluate creative performance pressure. Specifically, researchers have found that promotion focus serves as an important trait that makes individuals acquire skills, knowledge and other potential resources to build confidence and capability (Wallace, Butts, Johnson, Stevens, & Smith, 2016). These skills, knowledge and resources could help them deal with stressful situations and face the potential risks involved in creative performance pressure, making them less likely to appraise creative performance pressure as a hindrance. This suggests that by making potential growth and development involved in creative performance pressure more salient and motivating individuals to find potential coping resources, promotion focus strengthens the positive relationship between creative performance pressure and challenge appraisals and mitigates the positive relationship between creative performance pressure and hindrance appraisals. Thus, our third set of hypotheses is:

Hypothesis 3a. Promotion focus moderates the positive relationship between creative performance pressure and challenge appraisals, such that the relationship becomes stronger when promotion focus increases.

Hypothesis 3b. Promotion focus moderates the positive relationship between creative performance pressure and hindrance appraisals, such that the relationship becomes weaker when promotion focus increases.

A Moderated Mediation Model

As aforementioned, we hypothesize that servant leadership and promotion focus will moderate the differential effects of performance pressure on stress appraisals, which will in turn influence creativity. Specifically, high (vs. low) servant leadership will prioritize employees' needs and development and will offer them emotional resources, developmental support and organizational resources, making them more likely to appraise high creative performance pressure as a challenge (vs. a hindrance). By focusing on the challenging aspects of creative performance pressure, employees' creativity will be enhanced. In addition, high (vs. low) promotion focused individuals should have more personal resources available that help them paying attention to the positive aspects of creative performance pressure, which makes them less likely to appraise creative performance pressure as a hindrance. By reducing hindrance appraisal of creative performance pressure, employee creativity will be less harmed. In sum, we propose the model in Figure 1, in which creative performance pressure relates positively to challenge and hindrance appraisals, which subsequently relate to employee creativity. Further, the indirect effects are moderated by servant leadership and promotion-focus.

Hypothesis 4a. The indirect effect between creative performance pressure on creativity through challenge appraisal will be stronger when servant leadership is higher rather than lower.

Hypothesis 4b. The indirect effect between creative performance pressure on creativity through hindrance appraisal will be stronger when servant leadership is lower rather than higher.

Hypothesis 5a. The indirect effect between creative performance pressure on creativity through challenge appraisal will be stronger when promotion focus is higher rather than lower.

Hypothesis 5b. The indirect effect between creative performance pressure on creativity through hindrance appraisal will be stronger when promotion focus is lower rather than higher.

The above mentioned research goals and hypotheses will be examined in two consecutive studies: Study 1 developed and validated the measurement of creative performance pressure scale in two samples. In Study 2, we tested the overall model.

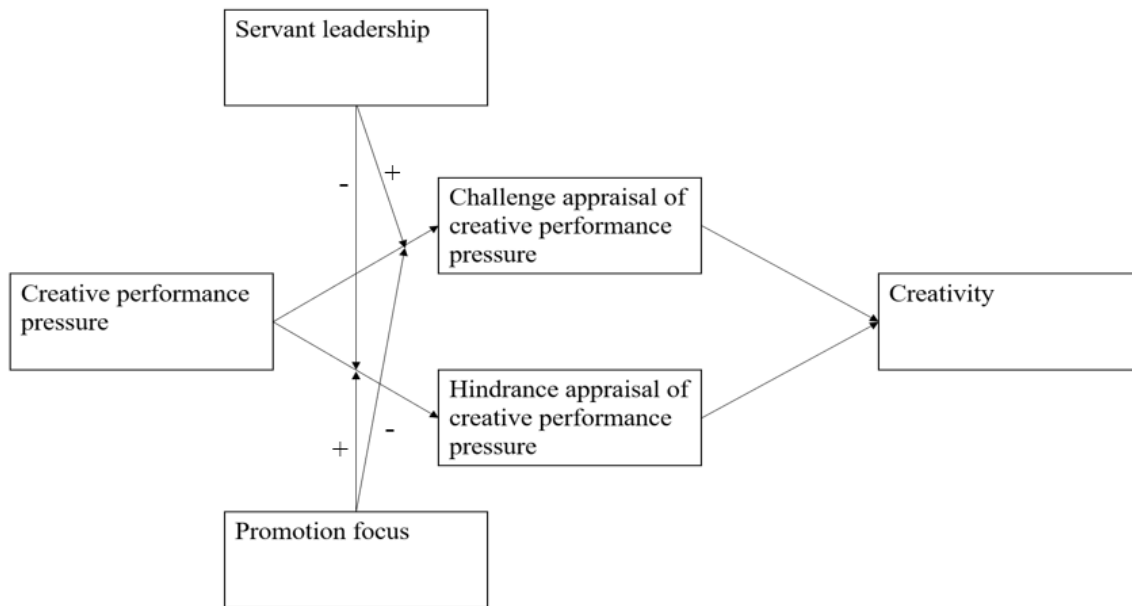


Figure 1. Theoretical Model

Study 1: Measurement of Creative Performance Pressure

No prior study has investigated creative performance pressure when studying creativity. Therefore, our first aim was to develop a valid measure of creative performance pressure. In doing so we looked at existing measures in the performance pressure and creativity literature to develop a measure of creative performance pressure using two separate samples. Sample 1 was used to develop and test a tentative measure of creative performance pressure, while Sample 2 was used to cross-validate the factor structure obtained for Sample 1 and to examine the convergent and divergent validity of our measure.

Method Study 1

Participants. Sample 1 was obtained by contacting an independent group of 207 employees from a high tech company in China. We received 181 valid responses (a response rate of 87%). Among the participants, 57% were male, the average age was 31.12 years ($SD = 1.97$) and on average they had worked for their current organization for 2.62 years ($SD =$

1.26). Sample 2 was obtained by contacting 288 participants from a real estate company in China. We received 253 valid responses (a response rate of 88%). Less than half of the participants were male (46% male) and had an average age of 27.15 years ($SD = 3.92$); and stayed in their current organization for 1.63 years ($SD = 1.14$).

Measures. A measure of *creative performance pressure* was included in both Sample 1 and Sample 2. It was obtained by adapting four items from prior research (Mitchell et al., 2019) in such a way that they reflect the pressure related to creative performance (i.e., the tension or urgency to generate novel and operable work-related ideas) (see Appendix for the items). The participants were requested to indicate the extent to which each of the four items matched their experience of creative performance pressure (1 = “strongly disagree”, 7 = “strongly agree.”). A sample item is “I feel tremendous pressure to find new uses for existing methods or equipment”.

In addition, to differentiate creative performance pressure from other related concepts, Sample 2 included creative requirements and routine performance pressure. Following translation/back-translation procedures, all items were translated into Chinese (Brislin, 1970). We measured *creative requirements* with five items developed by Unsworth et al. (2005). A sample item is “My job requires me to have ideas about changing ways of organizing work” (Cronbach's Alpha = .93). *Routine performance pressure* was measured with the four-item scale developed by Mitchell et al. (2019). A sample item is “The pressures for performance in my workplace are high” (Cronbach's Alpha = .92).

Analytical procedure. Exploratory factor analyses (Sample 1) and confirmatory factor analyses (Sample 2) using Mplus 7.0 (Muthén & Muthén, 2012) were conducted to examine the factor structure of the creative performance pressure scale. All questions were answered on a Likert-type scale (1 = “strongly disagree”; 7 = “strongly agree”).

Results Study 1

Sample 1. Using principal axis factor analysis, one factor was identified with an eigenvalue of 3.1 which explained 76.7 percent of the total variance of the items. All the factor loadings were greater than .70 and all were significant at $p < .01$. Cronbach's Alpha of the creative performance pressure scale in this study was .89.

Sample 2. In Sample 2 we examined whether the items measuring creative performance pressure converged well and whether this concept could be differentiated from related constructs (i.e., creative requirements and routine performance pressure). Our novel four-item creative performance pressure scale was reliable, Cronbach's Alpha = .94. Moreover, the average variance extracted (AVE) value was .80 for creative performance pressure, suggesting that it had satisfactory convergent validity. The square root of the AVE values for the three constructs (i.e., creative performance pressure, creative requirement and routine performance pressure) were all greater than the inter-construct correlations, providing evidence of discriminant validity (see Table 1).

Table 1. Means, Standard Deviations, Correlations, and Square Roots of AVE of Study Variables (Study 1: Sample 2)

Variables	Mean	SD	1	2	3
1. Creative performance pressure	4.45	1.24	-0.89		
2. Creative requirement	4.37	1.2	.56**	-0.86	
3. Routine performance pressure	5.05	1.08	.34**	.28*	-0.87

Note. $N = 253$. The square roots of AVE values are reported in the parentheses. ** $p < .01$.

Next, we performed a series of confirmatory factor analyses. As shown in Table 2, a reasonable fit was found for the hypothesized three-factor model ($\chi^2 = 120.18$, $df = 62$, RMSEA = .06, CFI = .98, TFI = .98, SRMR = .04). Additionally, this baseline model provided a better fit than other alternative models. Therefore, the analyses using Sample 2 show that the creative performance pressure scale had relatively good construct validity and could be differentiated from related constructs such as creative requirements and routine performance pressure.

Table 2. Confirmatory Factor Analyses of Measurement Models (Study 1: Sample 2)

Model	χ^2	df	$\Delta\chi^2$	RMSEA	CFI	TFI	SRMR
Model 1: Three factors	120.18	62		0.06	0.98	0.98	0.04
Model 2: creative performance pressure and creative requirement were combined into one factor	743.99	64	623.81***	0.20	0.76	0.71	0.11
Model 3: creative performance pressure and performance pressure were combined into one factor	831.61	64	334.01***	0.21	0.74	0.68	0.15

Note. $N = 253$. *** $p < .001$.

Conclusion Study 1

Taken together, our scale development procedures and empirical results indicate that our conceptualization of creative performance pressure as one-factor concept could be maintained. These findings suggest that this measure is well-suited as a starting point for further research on creative performance pressure.

Study 2: Hypothesis Testing

Based on the creative performance pressure measure developed in Study 1, Study 2 was designed to examine the full model and our hypotheses presented (see Figure 1).

Method Study 2

Participants. To test our hypotheses, we collected survey data from the sales teams of two fast-fashion retailers that sell clothing and shoes in Southern China. Embedded in an industry with high competition and uncertainty, the employees in these teams need to display creativity by developing new strategies to promote products, enhancing sales by changing product visibility and devising novel ways to cross-sell products. Such examples of creativity are being increasingly recognized as essential to gain success and competitive advantage for the companies. With the help of the companies' human resource managers, we conducted a field study using a multi-source, time-lagged research design from 276 employees and 41 supervisors. At the first time point, subordinates were asked to report demographics, creative performance pressure, promotion focus, and servant leadership. Two weeks later, subordinates rated their appraisals (challenge and hindrance) of creative performance pressure. Finally, after two weeks we collected supervisory ratings of employee creativity. We eliminated all dyads for which no complete information was available ($n = 51$, as either the subordinates or the leader did not submit data). The final sample comprised 225 employees and 39

supervisors, representing response rates of 81.5% and 95.1%, respectively. The average age of the sample was 31.49 years ($SD = 6.23$), the average organizational tenure was 3.65 years ($SD = 2.41$), and 69.8% were women. Of the respondents, 57.8% held a college degree and 32.4% held a university degree.

Measures. *Creative performance pressure* was measured with the scale developed in Study 1 (Cronbach's $\alpha = .91$).

Challenge and hindrance appraisals were measured by using the two four-item scales developed by Searle and Auton (2015). Respondents were asked to think about the creative performance pressure they experienced in the last two weeks and assess how it is likely to affect them. A sample item of challenge appraisal is “It will help me to learn a lot” (Cronbach's $\alpha = .93$). A sample item of hindrance appraisal is “It will hinder any achievements I might have” (Cronbach's $\alpha = .90$).

Servant leadership was measured by a 7-item scale from Liden et al. (2015). Sample items are “My leader puts my best interests ahead of his/her own”, and “My leader gives me the freedom to handle difficult situations in the way that I feel is best”. Cronbach's α was .91.

Promotion focus was measured with nine items of the Chinese version (Zhao & Namasisivayam, 2012) of the regulatory focus scale (Lockwood et al., 2002). Sample items are “I frequently imagine how I will achieve my hopes and aspirations” and “I often think about the person I would ideally like to be in the future”. The internal consistency of the overall scale was Cronbach's $\alpha = .91$.

Creativity was measured by asking managers to rate their subordinates' creativity using Oldham and Cummings' (1996) three-item scale, for example, “This person's work is creative” (Cronbach's $\alpha = .89$).

Control variables included demographic variables as well as subordinate cognitive flexibility. *Cognitive flexibility* is the ability to break old cognitive patterns and make novel (creative) associations (Ritter et al., 2012). It has been seen as a cognitive core of creative ability, thus it may influence how employees appraise creative performance pressure. We used the 12-item cognitive flexibility scale from Martin and Rubin (1995). A sample item is “I am willing to work at creative solutions to problems” (Cronbach's alpha = .95). Demographic variables included *age*, *gender* (0 = male, 1 = female), *level of education* (1 = High school or below, 2= College degree, 3 = Bachelor degree, 4 = Master degree or above) and *organizational tenure*. Studies of creativity indicate that these demographic factors may influence individual creative performance (e.g., Baer & Kaufman, 2008; Ng & Feldman, 2008). Note that we also conducted analyses with and without control variables, and, comparing the two, results were consistent and robust. These analyses are available upon request from the first or corresponding author.

Analytical Strategy. Given the nested structure of the data (i.e., a supervisor provided assessments for several subordinates), we employed multilevel modeling procedures via Mplus 7.0 (Muthén & Muthén, 2012) to deal with the issue of nonindependence caused by employees being nested in groups. In addition, following Selig and Preacher (2008), we tested indirect and conditional indirect relationships using a parameter-based resampling approach to calculate bias-corrected confidence intervals by using 20,000 resamples via the R program.

Results Study 2

Confirmatory Factor Analyses (CFA). We conducted a confirmatory factor analysis (CFA) to assess the distinctiveness of six core variables in our study (i.e., creative performance pressure, challenge appraisal, hindrance appraisal, servant leadership, promotion focus and creativity). The data demonstrated a reasonable fit with the hypothesized six-factor

model ($\chi^2 = 826.84$, $df = 419$, RMSEA = .06, CFI = .92, TFI = .91, SRMR = .05). More importantly, this baseline model provided a better fit than other alternative models, such as a five-factor model with challenge appraisal and hindrance appraisal collapsed into one factor ($\chi^2 = 1437.04$, $df = 424$, RMSEA = .10, CFI = .79, TLI = .77, SRMR = .10) and a one-factor model with all items loading on one factor ($\chi^2 = 4025.23$, $df = 423$, RMSEA = .19, CFI = .25, TLI = .20, SRMR = .20).

Descriptive statistics. Table 3 presents the means, standard deviations, and intercorrelations for the study variables. Creative performance pressure was positively related to both challenge appraisal ($r = .23$, $p < .01$) and hindrance appraisal ($r = .19$, $p < .01$). Furthermore, challenge appraisal was positively correlated with creativity ($r = .33$, $p < .01$), whereas hindrance appraisal was negatively correlated with creativity ($r = -.22$, $p < .01$). The pattern of these results is generally consistent with our mediation hypotheses H1a and H1b.

Hypotheses Tests. Hypothesis 1 predicted that there is a positive indirect effect of creative performance pressure on creativity through challenge appraisal. As shown in Table 4, creative performance pressure was positively related to challenge appraisal of creative performance pressure ($B = .27$, $SE = .10$, $p < .05$, Model 1). Challenge appraisal of creative performance pressure was positively related to employee creativity ($B = .22$, $SE = .05$, $p < .01$, Model 8). In addition, as shown in Table 5, the indirect effect from creative performance pressure to creativity through challenge appraisal of creative performance pressure was significant ($B = .07$, $SE = .03$, 95% bias-corrected CI = [.02, .13], excluding zero; hypothesis 1a supported).

Table 3. *Descriptive Statistics and Correlations for the Study Variables (Study 2)*

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Creative performance pressure	4.76	1.15	-.91									
2. Challenge appraisal	5.24	1.28	.23**	-.93								
3. Hindrance appraisal	4.11	1.48	.19**	-.14*	-.9							
4. Creativity	4.86	1.06	.08	.33**	-.22**	-.89						
5. Servant leadership	5.21	1.06	-.1	.13	-.09	.20**	-.91					
6. Promotion focus	5.29	1.05	.26**	.22**	.06	.15*	.06	-.91				
7. Cognitive flexibility	4.78	0.89	-.02	.17*	-.15*	.26**	.03	.04	-.95			
8. Age	31.49	6.2	.04	.04	.03	-.09	.03	-.05	-.01	--		
9. Gender	0.3	0.46	.03	-.04	.02	.05	-.04	-.04	-.02	-.14*	--	
10. Education	2.35	0.65	-.01	.05	.01	-.05	-.05	.05	-.03	.31**	-.19**	--
11. Tenure	3.65	2.41	-.05	.04	-.16*	.06	-.05	-.01	-.01	.16*	.01	.09

Note. $N=225$; Cronbach's alpha coefficients are in parentheses on the diagonal; * $p < .05$, ** $p < .01$ (two-tailed test).

Table 4. *Results of Regression Analysis (Study 2)*

	Challenge appraisal			Hindrance appraisal			Creativity	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Control variables								
Employee age	-.01(.01)	-.01(.01)	.01(.01)	.01(.02)	.02(.02)	.01(.02)	-.02(.01)	-.01(.01)
Employee gender	-.03(.20)	-.03(.18)	-.01(.21)	-.03(.26)	-.02(.26)	-.12(.24)	-.12(.17)	.11(.14)
Employee education	.09(.13)	.11(.12)	.04(.13)	.01(.12)	-.01(.13)	.04(.11)	.01(.12)	-.01(.10)
Employee tenure	.03(.03)	.02(.03)	.03(.03)	-.10(.03)	-.09(.03)	-.12(.03)	.04(.03)	.02(.03)
Cognitive flexibility	.25**(.07)	.26*(.10)	.25**(.07)	-.23(.12)	.13(.11)	.25*(.10)	.32**(.06)	.24**(.06)
Main effects								
Creative performance pressure	.27**(.10)	.31**(.10)	.20*(.10)	.25**(.10)	.21*(.10)	.31**(.10)	.10(.06)	.09(.05)
Servant leadership		.21*(.09)			-.16(.10)			
Promotion focus			.21*(.09)			-.01(.09)		
Interaction effects								
CPP * SL		.17*(.07)			-.27**(.07)			
CPP * PF			.13(.09)			-.26**(.08)		
Mediation effects								
Challenge appraisal								.22**(.05)
Hindrance appraisal								-.15**(.05)
-2 Log-Likelihood	727.10	714.68	718.10	787.54	770.70	775.40	631.96	598.08

Note. * $p < .05$, ** $p < .01$. CPP = Creative performance pressure; SL = Servant leadership; PF = Promotion focus.

Hypothesis 1b predicted that there is a negative indirect effect of creative performance pressure on creativity through hindrance appraisal. As shown in Table 4, the direct effect of creative performance pressure on hindrance appraisal of creative performance pressure was significant and positive ($B = .25$, $SE = .10$, $p < .01$, Model 4). Hindrance appraisal of creative performance pressure was negatively related to creativity ($B = -.15$, $SE = .05$, $p < .01$, Model 8). In addition, as shown in Table 5, the indirect effect from creative performance pressure to creativity through hindrance appraisal of creative performance pressure was significant ($B = -.04$, $SE = .02$, 95% bias-corrected CI = $[-.08, -.01]$, excluding zero), supporting Hypothesis 1b.

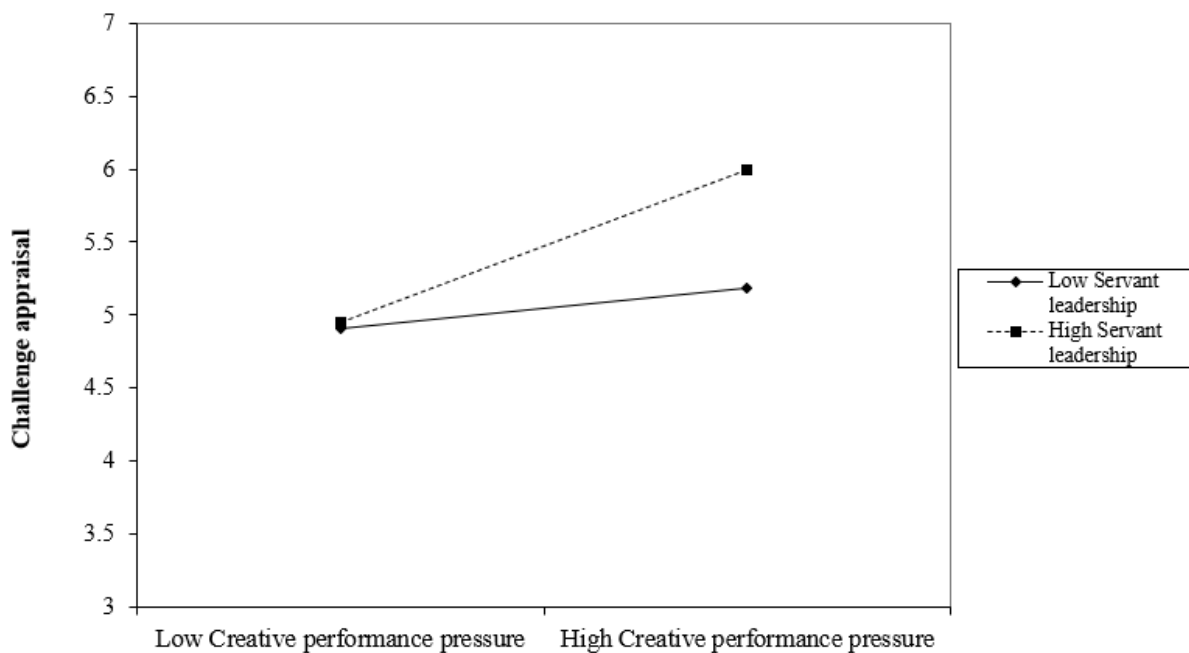


Figure 2. Interaction of Creative Performance Pressure and Servant Leadership on Challenge Appraisal

Hypothesis 2a predicted that the positive relationship between creative performance pressure and challenge appraisal becomes stronger when servant leadership increases. As shown in Table 4, the interaction term was significant on challenge appraisal ($B = .17$, $SE = .07$, $p < .05$, Model 2). The interaction effect is presented in Figure 2. The relationship

between creative performance pressure and challenge appraisal was positively significant in the high servant leadership group (1 *SD* above the mean, $B = .48$, $SE = .13$, $p < .01$).

However, this relationship was insignificant in the low servant leadership group (1 *SD* below the mean, $B = .13$, $SE = .12$, *n.s.*). The difference between high and low servant leadership groups was significant ($B_{diff} = .35$, $SE = .16$, $p < .05$). Taken together, Hypothesis 2a was supported.

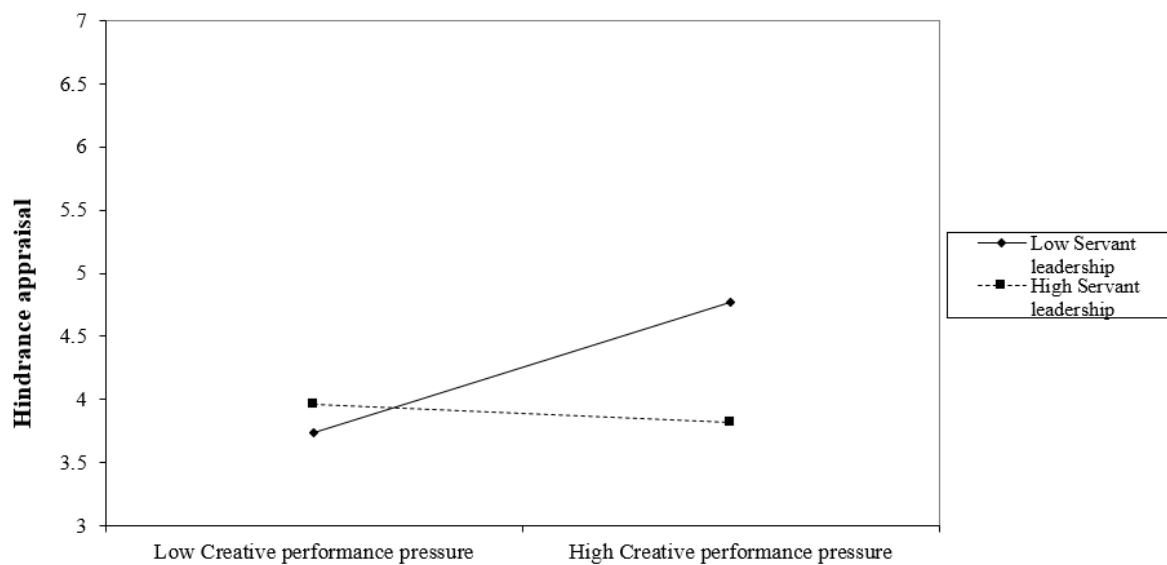


Figure 3. Interaction of Creative Performance Pressure and Servant Leadership on Hindrance Appraisal

Hypothesis 2b predicted that the positive relationship between creative performance pressure and hindrance appraisal becomes weaker when servant leadership increases. Table 4 shows that the interaction term was significant on hindrance appraisal ($B = -.27$, $SE = .07$, $p < .01$, Model 5). We plotted the interaction effect in Figure 3. The relationship between creative performance pressure and hindrance appraisal was positively significant in the low servant leadership group (1 *SD* below the mean, $B = .50$, $SE = .12$, $p < .01$). However, this relationship was insignificant in the high servant leadership group (1 *SD* above the mean, $B = -.07$, $SE = .14$, *n.s.*). The difference between high and low servant leadership groups was significant ($B_{diff} = -.57$, $SE = .15$, $p < .01$). In conjunction, these findings support Hypothesis

2b.

Hypothesis 3a stated that the positive relationship between creative performance pressure and challenge appraisal becomes stronger when promotion focus increases. As shown in Table 4, the interaction term was not significant for challenge appraisal ($B = .13$, $SE = .09$, *n.s.*, Model 3). Hypothesis 3a was not supported.

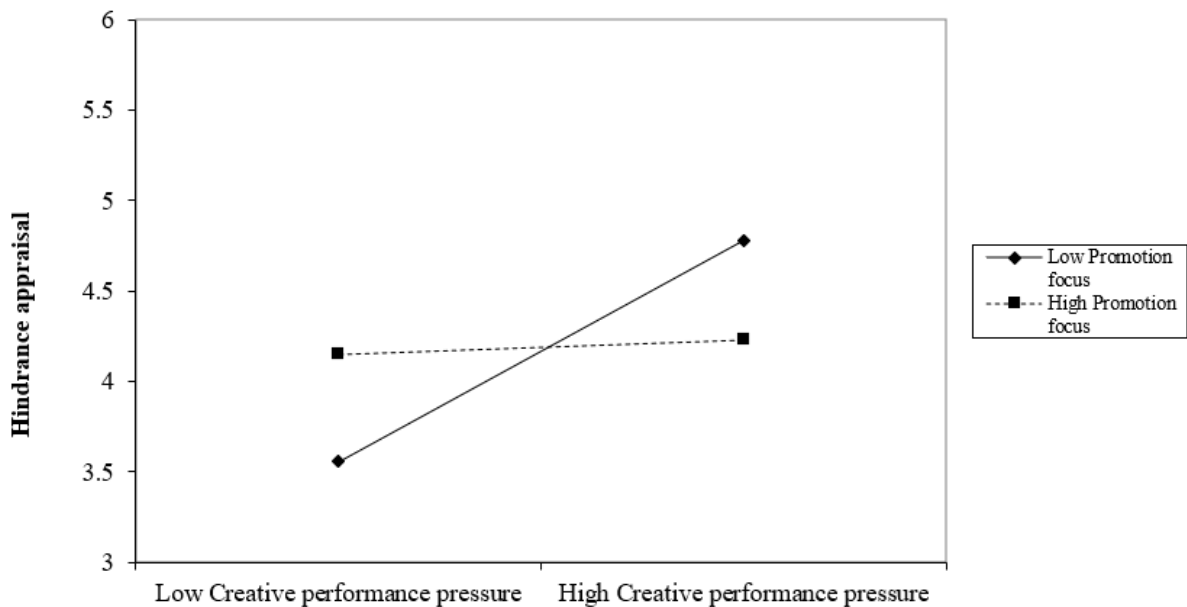


Figure 4. Interaction of Creative Performance Pressure and Promotion focus on Hindrance

Hypothesis 3b proposed that the positive relationship between creative performance pressure and hindrance appraisal becomes weaker when promotion focus increases. As shown in Table 4, the interaction term was significant for hindrance appraisal ($B = -.26$, $SE = .08$, $p < .01$, Model 6). We plotted the interaction effect in Figure 4. The relationship between creative performance pressure and hindrance appraisal was weaker when promotion focus was higher (1 *SD* above the mean, $B = .03$, $SE = .13$ *n.s.*) than when promotion focus was lower (1 *SD* below the mean, $B = .58$, $SE = .13$, $p < .01$). The difference between high and low promotion focus conditions was significant ($B_{diff} = -.55$, $SE = .16$, $p < .01$). Taken together,

Hypothesis 3b was supported.

We further tested whether the indirect relationships between creative performance pressure and creativity via appraisals (challenge, H4a; hindrance, H4b) were moderated by servant leadership. As shown in Table 5, the indirect relationship between creative performance pressure and creativity was significant in the high servant leadership group ($B = .13$, $SE = .04$; 95% bias-corrected CI = [.04, .20], excluding zero). Meanwhile, this indirect relationship was insignificant in the low servant leadership group ($B = .01$, $SE = .04$; 95% bias-corrected CI = [-.04, .08], including zero). The difference between the high and low servant leadership groups was significant ($B_{diff} = .11$, $SE = .05$, 95% bias-corrected CI = [.02, .18], excluding zero). Thus, H4a was supported.

In addition, we found the indirect relationship between creative performance pressure and creativity via hindrance appraisal was significant in the low servant leadership group ($B = -.08$, $SE = .03$; 95% bias-corrected CI = [-.13, -.02], excluding zero). However, this indirect effect was insignificant in the high servant leadership group ($B = .01$, $SE = .02$; 95% bias-corrected CI = [-.03, .05], including zero). The difference between the high and low servant leadership groups was significant ($B_{diff} = .09$, $SE = .04$, 95% bias-corrected CI = [.02, .16], excluding zero). Thus, H4b was supported.

We then examined whether the indirect relationships between creative performance pressure and creativity via appraisals were moderated by promotion focus (H5a, b). As shown in Table 3, the indirect relationship between creative performance pressure and creativity was insignificant for both high and low promotion focus ($B = .07$, $SE = .04$; 95% bias-corrected CI = [-.01, .15], including zero; and $B = .02$, $SE = .03$; 95% bias-corrected CI = [-.04, .07], including zero, respectively). The difference between high and low promotion focus conditions was also not significant ($B_{diff} = .05$, $SE = .05$, 95% bias-corrected CI = [-.03, .15],

including zero). Thus, H5a was not supported.

Finally, Table 5 reveals that the indirect relationship between creative performance pressure and creativity via hindrance appraisal was not significant when promotion focus was high ($B = -.02$, $SE = .02$; 95% bias-corrected CI = $[-.06, .02]$, including zero). However, this indirect relationship was significant when promotion focus was low ($B = -.08$, $SE = .03$; 95% bias-corrected CI = $[-.14, -.02]$, excluding zero). The difference between high and low promotion conditions was not significant ($B_{diff} = .06$, $SE = .03$, 95% bias-corrected CI = $[-.01, .12]$, including zero). Thus, H5b was supported.

Conclusion Study 2

The results of Study 2 reveal that creative performance pressure can be appraised as a challenge, which promotes creativity; whereas it may also be appraised as a hindrance, which reduces employee creativity. In addition, we find that servant leadership influences the relationship between creative performance pressure and creativity through different appraisals. In particular, followers who perceive their leaders as more serving are more likely to appraise creative performance pressure as an opportunity to promote growth and achievement, and are more likely to respond to this challenge appraisal with increased creativity. Conversely, followers who perceive their leader as low on serving are more likely to appraise it as a constraint, and are more likely to respond to this hindrance appraisal with low creativity. In addition, we find that promotion focus moderates the positive relationship between creative performance pressure and hindrance appraisal such that the relationship between creative performance pressure and hindrance appraisal was weaker when promotion focus was higher.

Table 5. *Results of Indirect Relationship and Conditional Indirect Relationships (Study 2)*

Relationships	<i>B</i>	<i>SE</i>	95% bias-corrected CI
Creative performance pressure → Challenge appraisal → Creativity			
Indirect relationship	.07	.03	[.02,.13]
Conditional indirect relationships			
High servant leadership (+1 <i>SD</i>)	.13	.04	[.04,.20]
Low servant leadership (-1 <i>SD</i>)	.01	.04	[-.04,.08]
Difference	.11	.05	[.02,.18]
High promotion focus (+1 <i>SD</i>)	.07	.04	[-.01,.15]
Low promotion focus (-1 <i>SD</i>)	.02	.03	[-.04,.07]
Difference	.05	.05	[-.03,.15]
Creative performance pressure → Hindrance appraisal → Creativity			
Indirect relationship	-.04	.02	[-.08,-.01]
Conditional indirect relationships			
High servant leadership (+1 <i>SD</i>)	.01	.02	[-.03,.05]
Low servant leadership (-1 <i>SD</i>)	-.08	.03	[-.13,-.02]
Difference	.09	.04	[.02,.16]
High promotion focus (+1 <i>SD</i>)	-.02	.02	[-.06,.02]
Low promotion focus (-1 <i>SD</i>)	-.08	.03	[-.14,-.02]
Difference	.06	.03	[.01,.12]

Overall Discussion

Creativity plays a key role in the success of today's organizations and employees (Anderson, et al., 2014), however, the literature to date is mixed regarding the effect of work stressors on employee's creativity (i.e., positive, negative, or U-shape; Bormann, 2020; Gutnick et al., 2012; Montani, Setti, Sommovigo, Courcy, & Giorgi, 2019). In this research, building on the transactional stress theory (Lazarus & Folkman, 1984) and presenting three studies (two to develop and validate a novel measure of creative performance pressure with two samples, $N = 181$ and 253 , respectively, and a third one using a three-wave time-lagged design, $N = 225$), we found that creative performance pressure has both positive and negative effects on supervisor-rated employee creativity. A focus on the bright sides of creative performance

pressure (e.g., an opportunity for growth or potential achievements) triggers challenge appraisals, which relate to increased employee creativity. Conversely, a focus on the dark sides of creative performance pressure (e.g., constraints and failures) elicits hindrance appraisals, which relate to decreased employee creativity.

Job and personal resources (i.e., servant leadership and promotion focus, respectively) play a critical role in shaping how one perceives the creative performance pressure. In particular, when leaders provide service and stewardship to followers or empower and develop people with empathy and humility (Mittal & Dorfman, 2012), employees were more likely to appraise this pressure as challenging and less likely to see it as hindering. Moreover, servant leadership moderated both the mediating effect of challenge appraisals in transmitting the positive effect of creative performance pressure to creativity and the mediating effect of hindrance appraisals in transmitting the negative effect of creative performance pressure to creativity. In addition, promotion focus was an influential personal resource that impacted how one perceives the pressure. Low promotion-focused employees were more likely to appraise the pressure as high-hindering.

However, the hypothesized moderating effect of promotion-focus was only supported for hindrance appraisals, and not for challenge appraisal. A potential explanation is that creative performance pressure is often perceived as a challenge rather than as a hindrance stressor, as indicated by the means for these concepts in Table 3. Thus, this result might be due to a ceiling effect, in that individuals experiencing high creative performance pressure are already likely to perceive creative performance pressure as a challenge, and a high promotion focus will probably not result in even higher levels of challenge appraisal. Similarly, Koopmann et al. (2019) found that high promotion-focused employees may not benefit from appraising their positive experiences as challenging in order to increase positive emotion, as

they already tend to have higher levels of positive emotions. Contrarily, when employees are promotion-focused, they will less likely see their job demands as hindering.

Theoretical Implications

Our study provides several implications for theory. First, by introducing a new construct – creative performance pressure – and exploring its influence on creativity, our research contributes to the creativity literature. Whereas both academics and practitioners think highly of creativity and employees in organizations increasingly realize the importance and urgency to increase their creative performance (Malik et al., 2015), a systematic conceptualization and a psychometrically valid scale of creative performance pressure for researchers to examine this phenomenon was still lacking. By differentiating it from creative requirement and routine performance pressure conceptually and empirically, we introduced a creativity-specific pressure and provided a viable instrument for future research incorporating creative performance pressure. Relatedly, since there is a widespread push for employees to be more creative at work (Tierney & Farmer, 2011; Unsworth et al., 2005), by pointing out the double-edged effect of creative performance pressure on creativity, we demonstrate that the tension or urgency for employees to achieve high creative performance is not always beneficial.

Second, by examining the mediating roles of different cognitive mechanisms, we offer a new way to address the mixed findings regarding the effects of work stressors on creativity. The relationship between work stressor and creativity is mixed in the current literature, with studies showing positive (e.g., Ohly & Fritz, 2010), negative (e.g., Shalley & Perry-Smith, 2001), as well as curvilinear relationships (e.g., Baer & Oldham, 2006; Byron et al., 2010). Our research built on the challenge-hindrance stressor framework (e.g., Cavanaugh et al., 2000; LePine et al., 2005) and suggested that the inconsistent findings can be explained by different appraisals, which is also in response to Gutnick's et al. (2012) call for providing a

systematic and in-depth research to explore the influence of work stressor and creativity.

A third important contribution of our research is that we identified crucial factors that moderate the indirect creative performance pressure – creativity relationship. Drawing on the theory that highlights the interplay of both work stressors and job resources in relation to employee stress reactions (Bakker & Demerouti, 2017; Lazarus & Folkman, 1984), we demonstrated that job and personal resources can function as boundary conditions that can modify the effects of creative performance pressure on appraisals and outcomes. In particular, we found that having a servant leader or a promotion focus can serve as important job and personal resources, respectively, thereby regulating employees' appraisal of high-pressure situations. This is important since many researchers who have applied the challenge-hindrance model seem to assume that employees appraise these stressors similarly (e.g., Byron, Peterson, Zhang, & LePine, 2018; LePine et al., 2005). However, this assumption is inconsistent with the transactional stress theory (Lazarus & Folkman, 1984) as well as the nature of appraisal. By testing the moderating roles of servant leadership and promotion focus, our results demonstrate that the appraisal process is context-specific and depends on individual differences.

Finally, our research contributes to the literature on servant leadership. While studies have reported the influence of servant leadership on leader-follower relationships and employees' psychological states such as trust (see for reviews Eva et al., 2019, and Van Dierendonck, 2011), no studies have specifically examined how servant leadership impacts followers' cognitive reactions to specific work stressors. Our research extends current knowledge in this area by affirming that servant leadership is effective in increasing the positive effects and buffering the negative effects of creative performance pressure on creativity.

Practical Implications

Although creativity is key to today's organizational success (Anderson et al., 2014; Gutnick et al., 2012), the pressure to display high levels of creative performance could be a unique source of work stressor for employees. Our research shows that creative performance pressure has both positive and negative effects on supervisor-rated employee creativity. A major implication for practice is that when dealing with creative performance pressure, employees should be stimulated to focus on the positive sides (i.e., challenge appraisals – seeing it as an opportunity to learn and grow; LePine et al., 2016), which is associated with increased employee creativity. For example, to fully harvest new ideas and initiatives originating from employees, organizations may create and encourage learning-focused environments, which induce the recognition of achievement and the successful acquisition of new skills. Moreover, leaders should carefully express their creative performance requirements to employees and emphasize the potential benefits and opportunities of these high requirements to avoid triggering creative performance pressure.

Second, our results demonstrated that servant leadership and promotion focus can regulate employees' attention when experiencing creative performance pressure. When employees perceived their leaders truly served their employees, they are more likely to see creative performance pressure as challenging and are less likely to see it as hindering. Therefore, leaders need to motivate themselves truly to serve employees and to help creating a creative working environment that promotes employee's challenge appraisals of creative performance pressure. In addition, individual promotion focus influences the relationship between creative performance pressure and hindrance appraisals. Employees with a high promotion focus are less likely to see creative performance pressure as hindering, which may buffer the negative impact of pressure on employee creativity. This has important practical implications for organization recruitment and the assignment of work demands. In particular,

for jobs that may induce high creative performance pressure, high-promotion focused candidates should be preferred. As regards those with low promotion focus, leaders may attempt to carefully and gradually increase their experienced level of creative performance pressure and provide support and other resources even more carefully.

Limitations and Future Research

In spite of these strengths and contributions, several limitations should be considered when interpreting the results of this research. First, although Study 2 was based on a multi-wave time-lagged design, we could not test the reciprocal impact of creativity on creative pressures or appraisals as this was not a full panel study. Relatedly, Study 2 is limited in testing the causal effects among our variables, as the significant findings might be caused by endogeneity bias (e.g., reciprocal causality or due to omitted variables; Antonakis, Bendahan, Jacquart, & Lalive, 2010). To address this concern, we controlled for employee cognitive flexibility at T1 since cognitive flexibility, as a cognitive core of creativity, is the ability to be flexible and make creative associations (Ritter et al., 2012) and may thus influence how employees appraise creative performance pressure. Future research should further test the causality by using longitudinal and experimental designs (Antonakis et al., 2010). For instance, by creating different creative performance pressure conditions (high vs. low), researchers could test how this influences employee appraisals and creativity.

Second, although we focused on the individual level of analysis to test our hypotheses (i.e., the between-person level), future research could extend creative performance pressure by applying a multi-level approach (i.e., team level and within-person level). This is important since the group context may have an important and unique impact on group behaviors (Choi & Sy, 2009; Mao, Chang, Gong, & Xie, 2021) and team-level creative performance pressure may provide a more reliable estimation of the work context and could reveal consequences

that may differ from those found at the individual level. For example, it is possible that when teams face high creative performance pressure, team members are likely to unite, pool resources internally, and respond collectively to the pressure. In addition, future research on creative performance pressure can investigate the within-person level relationships (i.e., how the reactions to daily creative performance pressure are influenced by daily fluctuations in how the pressure is appraised).

Third, our research demonstrated that servant leadership and promotion focus can serve as important job and personal resources that regulate the relationship between creative performance pressure and stressor appraisals. Thus, one direction for future inquiry is an increased focus on the role of other job and personal resources in the work stressor appraisal process. For instance, whether autonomy or job control (Häusser, Mojzisch, Niesel, & Schulz-Hardt, 2010) buffer the detrimental effect of work stressors on work outcomes through appraisals still needs further investigation. Therefore, future studies can investigate the interaction effect between other work stressors and resources on employee appraisals to further clarify when and how work stressors influence employee's perceptions of work stressors and their impact on individual and organizational outcomes.

Fourth, our research focuses primarily on creative performance pressure experienced by employees and how creative performance pressure relates to employee creativity. Obviously, leaders also encounter creative performance pressure, and their perception of creative performance pressure may have crossover effects on employees' perceptions of creative performance pressure, appraisals and work outcomes. For instance, it has been shown that leaders' emotion appraisals are positively related to team member's emotion appraisal (Chang, Sy, & Choi, 2012). It will be interesting to test whether leaders have different appraisals of creative performance pressure and how these different appraisals influence their behavior, which may translate into positive/negative results for employees.

Conclusion

Is creative performance pressure good or bad for employee creativity? Our research demonstrated that it could be both, depending on the type of appraisal (i.e. challenge or hindrance appraisals). In addition, servant leadership appears to exaggerate the positive effect of challenge appraisal and ameliorate the negative effect of hindrance appraisals. We recommend that future creativity studies should take a more balanced picture by investigating the potential dark sides of pressure to be creative. Moreover, experimental studies or full-panel longitudinal studies are encouraged to investigate the causal effects of work pressure on creativity, or other alternative mechanisms and moderators should be tested in the future.

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Appendix A

Creative performance pressure measurement

1. The pressures for demonstrating originality in my workplace are high.
2. I feel tremendous pressure to find new uses for existing methods or equipment.
3. If I don't produce new ideas at high levels, my job will be at risk.
4. I would characterize my workplace as an environment where I have to identify opportunities for new products/processes.

Note: These items were adapted from Mitchell et al. (2018).

Chapter 8

Do Daily Motivational Demands Promote or Inhibit one's Performance and Well-being?

The role of Appraisals and Empowering Leadership

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Abstract

Many of today's jobs require employees to "set their own goals, decide how hard they work to achieve that goal, and decide when the task is complete" (i.e., motivational demands; Taris & Hu, 2020). However, when and how such motivational demands influence employee outcomes remains unclear. Building on transactional stress theory, we develop a dual-pathway model in which motivational demands have unique relationships with employee outcomes (task performance, creativity, and exhaustion) through two independent pathways: challenge and hindrance appraisals. And empowering leadership as a job resource will moderate the relationship between motivational demands and its appraisals. We conducted a 10-day diary study in China to test our hypotheses (105 participants with 949 daily observations). Multilevel analysis revealed that motivational demands positively related to creativity and task performance both directly and indirectly (through challenge appraisal), whereas it was negatively linked to exhaustion both directly and indirectly (through hindrance appraisal). Results also suggest that day-level appraisals had lagged effects on employee outcomes. In addition, we found that empowering leadership moderated the relationship between motivational demands and appraisals. Theoretical and practical implications are discussed.

Keywords: Motivational demands, appraisals, empowering leadership, diary study

Introduction

Employees around the world have experienced unexpected, significant changes in their daily work due to the COVID-19 pandemic (Kniffin et al., 2020; Vaziri et al., 2020). One of the biggest changes is that many office-based employees had to make an abrupt shift to full-time working from home. Therefore, rather than relying on colleagues and supervisors, employees needed to set their own goals, decide how hard they work to achieve that goal, and decide when to complete the task (i.e., motivational demands; Taris & Hu, 2020). The concept of motivational demands was introduced by Taris (2019) as a new type of job characteristic that may be relevant to many of today's jobs where people at work have no formal supervisors, or supervisors who (due to the circumstances) are unable to supervise their subordinates appropriately (especially during the COVID-19 periods). Prior studies have shown that motivational demands are associated with a wide variety of employee outcomes including higher well-being, performance (Taris, 2019), and innovative behavior (Taris & Hu, 2020). Although these findings are insightful, our understanding of motivational demands remains incomplete owing to two fundamental issues: Do they promote or inhibit one's performance and well-being at a daily level? And what are the mechanisms that link motivational demands to outcomes?

The current research aims to address these issues by using a diary study design. We contribute to the literature in several ways. First, building on transactional stress theory (Lazarus & Folkman, 1984), we propose that appraisals (i.e., challenge and hindrance) will mediate the relationship between motivational demands and employee performance (task performance and creativity) and well-being (i.e., exhaustion). Lazarus and Folkman (1984) stated that individuals' cognitive appraisals play a crucial role in determining different ways of coping and outcomes. Similarly, prior studies have revealed that appraisal is a major

mechanism linking job demands to outcomes (e.g., Ma et al., 2021; Mitchell et al., 2019; Sessions et al., 2019). Thus, we investigate the mediating role of appraisals. By doing this, we focus on a critical cognitive mechanism that might explain the relationships between motivational demands and outcomes. Evidence for dual pathways (i.e., challenge and hindrance appraisals) from motivational demands to individual outcomes would provide insight into the bright and dark sides of self-motivating at work.

In addition, we contribute to the appraisal literature by including empowering leadership as a moderator. Gutnick et al. (2012) suggested that leaders can build important resources by providing useful information to and support their employees, facilitating their challenge appraisals. In line with this argument, previous studies found that charismatic leadership (LePine et al., 2016), servant leadership (Liu et al., 2021), and leader-member exchange (Spurk et al., 2021) moderated the stressor – appraisals relationships (i.e., facilitate challenge appraisals). Our study expands this field by using empowering leadership as an important boundary condition of the effects of demands on appraisals, as it has been demonstrated to be an important job resource related to employee outcomes (e.g., Li, Sun et al., 2021; Schilpzand et al., 2018).

Finally, this study contributes to the motivational demands literature by using a diary study design, testing how motivational demands influence employee outcomes at the day level. Whereas previous studies examined motivational demands mainly using cross-sectional designs (e.g., Taris & Hu, 2020), we extend this literature by assessing daily motivational demands and outcomes. This provides insight into the dynamics of motivational demands and reduces retrospective bias (Bolger et al., 2003). As such, we offer one of the most robust tests to date on the effects of motivational demands.

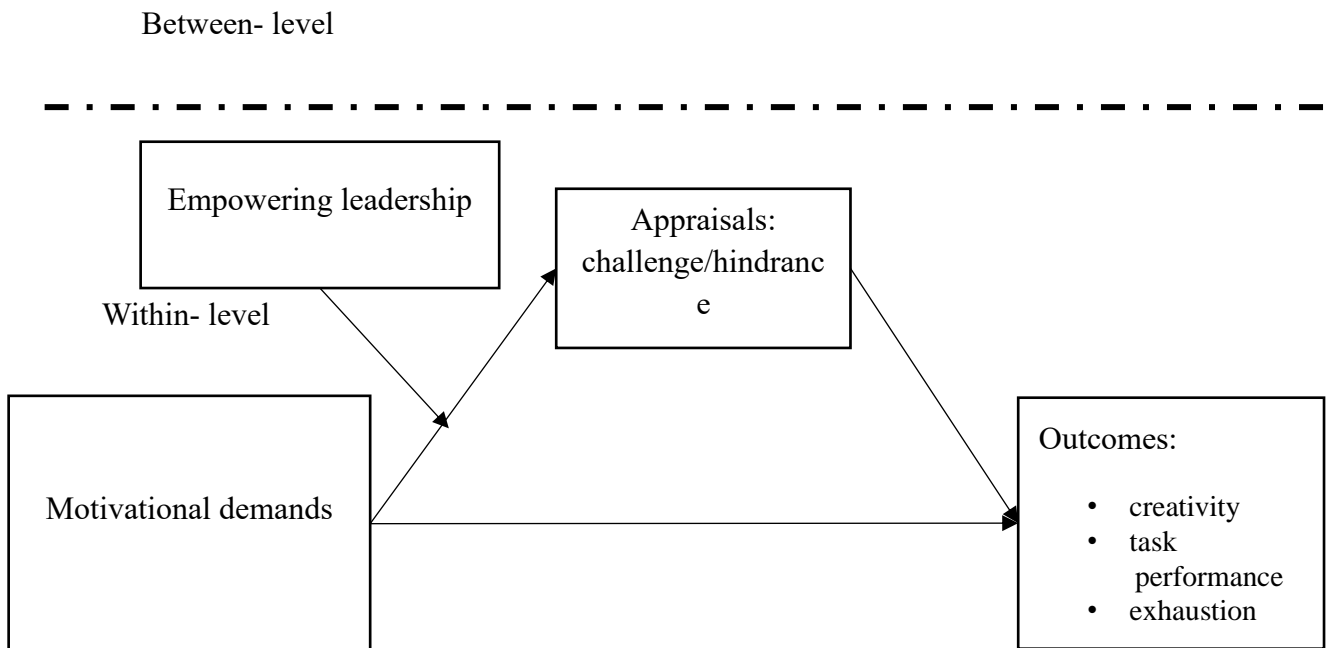


Figure 1. The Conceptual Model

Theoretical Background and Hypotheses

Motivational Job Demands and Employee Outcomes

The concept of motivational job demands was introduced by Taris (2019), referring to “the extent to which adequate performance requires employees to regulate their own efforts at work by setting themselves goals to be achieved (goal setting), to determine (b) how hard they work on a specific task (effort or intensity), and (c) how long they work on this task (persistence)” (Taris, 2019; Taris & Hu, 2020, p. 2). The ongoing changes in the workplace have resulted in a greater need for employees to motivate themselves while at work. In particular, the COVID-19 pandemic has made many employees working from home. It has become difficult for managers to supervise their subordinates as their supervisor is physically not in their vicinity, which may influence how employees perform (task performance) and how they feel (i.e., well-being).

Existing studies have suggested that motivational demands are related to favorable outcomes. For instance, in an unpublished master thesis, C. Bakker (2018) found that employees perceived motivational demands as a challenge job demand and have a positive effect on work engagement. Similarly, in two samples of Dutch employees, Taris (2019) identified them as an antecedent of individuals' well-being, performance, and motivation. Additionally, Taris and Hu (2020) validated the concept and showed that motivational demands can be differentiated from other related concepts (e.g., job autonomy and job crafting), and are positively linked passion at work and individual innovation behavior. To advance the existing knowledge, we suggest that the impact of motivational demands on employee performance and well-being can be explained by employees' cognitive appraisal (i.e., challenge and hindrance appraisals of motivational demands).

Cognitive Theories of Appraisals

Building on transactional stress theory (Lazarus & Folkman, 1984), an individual's perception of a stressor (e.g., job demands) can take fundamentally different forms, depending on how he/she appraises the situation. Cognitive appraisal refers to the process of evaluating a stimulus in terms of its relevance and implications for one's well-being. The primary appraisal answers questions of subjective relevance (i.e., how stressful the situation is). Depending on this appraisal, one can see a situation as a challenge or a hindrance. *Challenge appraisals* refer to perceptions that job demands, although potentially stressful, have the potential for personal rewards (e.g., praise), mastery, and growth; whereas *hindrance appraisals* refer to perceptions that job demands will thwart or constrain one to achieve valued goals (LePine et al., 2016). The transactional stress theory suggests that it is possible to appraise job demands both as challenging and hindering. Similarly, previous studies showed that time urgency, role conflict (Li et al., 2020), employee voice behavior (Sessions et al., 2019), work interruptions (Smith et al., 2020), and competitive psychological climate

(Spurk et al., 2021) can indeed be appraised as both challenges and hindrances. In a cross-sectional study, C. Bakker (2018) showed that motivational demands can be appraised as challenges whereas to some degree as hindering. Thus, building on transactional stress theory and empirical studies (i.e., C. Bakker, 2018; Li et al., 2020; Spurk et al., 2021), we argue that motivational demands can be appraised both as challenging and hindering across days.

Appraisals and Outcomes

We argue that different types of appraisals are differently related to employee outcomes. In particular, challenge appraisals will promote performance and well-being, whereas hindrance appraisals will inhibit one's performance and well-being. This is because when a job demand is perceived as challenging, employees are motivated to cope with the problem through increased effort (Perrewé & Zellars, 1999). For instance, Liu and Li (2018) found that challenge appraisal is positively related to motivation to work. Conversely, hindrance appraisals are likely to be associated with low motivation, as people are inclined to believe that they are less likely to meet them. Because no reasonable level of effort will be adequate to meet these types of demands, they will tend to have low motivation to expend effort on coping, regardless of any desire to cope based on the subjective value of potential outcomes (LePine et al., 2005, p.765-766). That is, hindrance appraisal can reduce one's task persistence and work motivation (Liu & Li, 2018). Similarly, empirical studies have shown that challenge appraisals of work demands are positively related to task proficiency (Mitchell et al., 2019) and task performance (LePine et al., 2016). Hindrance appraisals were negatively related to employee task performance (LePine et al., 2016) and engagement (Ma et al., 2021), whereas positively related to exhaustion (Huang et al., 2015) and job-related anxiety (Ma et al., 2021). Thus, we can conclude that challenge appraisal will produce favorable outcomes and hindrance appraisal will produce unfavorable outcomes.

This study includes creativity and task performance as two main indicators of performance. Creativity refers to the production of novel and useful ideas, products, services (Amabile et al., 1996; Zhou & Shalley, 2003). It has been viewed as a cornerstone for today's success of organizations (Gutnick et al., 2012; Zhou & Hoever, 2014). Task performance, defined as how proficiently an employee executes prescribed work tasks that directly contribute to the organization's technical core (Borman & Motowidlo, 1997; Sonnentag & Frese, 2002), are usually treated as important behavioral outcomes. For well-being outcomes, we include exhaustion as a form of ill-well-being. These outcomes were selected as (a) theoretically, demands have been linked to employee well-being and performance (e.g., in the Job Demands-Resources model; Demerouti et al., 2001). In addition, researchers argued that a "percept-percept bias" might inflate the results when using an appraisal of particular job demand as challenging, then investigating a positive outcome (e.g., job satisfaction; Cavanaugh et al., 2000), as findings might be inflated due to employing semantically synonymous items. Thus, we chose exhaustion as a negative well-being outcome; (b) the conceptualization of motivational demands implies that it will influence how one performs (i.e., performance) and how one feels (well-being); and (c) meta-analyses also showed that demands are moderately linked to exhaustion (e.g., Alarcon, 2011) and employee performance (LePine et al., 2005). Taken together, it is expected that

Hypothesis 1 (a-c): On a daily basis, challenge appraisals of motivational job demands will be positively related to employee performance and creativity, whereas negatively related to exhaustion.

Hypothesis 2 (a-c): On a daily basis, hindrance appraisals of motivational job demands will be negatively related to employee performance and creativity, whereas positively related to exhaustion.

Mediation Effect of Appraisals

As aforementioned, building on transactional stress theory, appraisals have been viewed as a major mechanism that links stressors to outcomes. This theory suggests that job demands can be appraised differently by individuals, and how individuals appraise job demands can trigger different coping strategies, which can further produce different outcomes (Lazarus & Folkman, 1984). That is, job demands will relate to employee outcomes via cognitive appraisals. Prior studies also showed that appraisals mediate the relationship between job demands and outcomes (e.g., Mitchell et al., 2019). For instance, challenge appraisals mediate the positive relationship between stressors and outcomes (e.g., performance, Mitchell et al., 2019; creativity, Liu et al., 2021), whereas hindrance appraisals mediate the negative relationship between stressors and creativity (Liu et al., 2021). In addition, our previous argument suggests that motivational demands could be appraised both as challenging and hindering across time, and challenge appraisal and hindrance appraisal will be differently related to employee performance, creativity, and exhaustion. Taken together, we propose

Hypothesis 3(a-c): On a daily basis, challenge appraisals will mediate the relationships between motivational demands and task performance, creativity, and exhaustion.

Hypothesis 4(a-c): On a daily basis, hindrance appraisals will mediate the relationships between motivational demands and task performance, creativity, and exhaustion.

The Moderating Effect of Empowering Leadership

The transactional stress theory suggests that appraisals are a function of the interplay between situational factors (e.g., work stressors) and personal resources (Lazarus & Folkman, 1984). In an organizational context, the role of leadership is a critical organizational factor that could influence the impact of job demands on employee appraisals. Prior studies have shown that

leadership plays a crucial role in influencing employees' resources and engagement (Li, Sun et al., 2021), thereby facilitating challenge appraisal (e.g., LePine et al., 2016). In this study, we argue that empowering leadership can serve as an important boundary condition in understanding the association between motivational demands and appraisals.

Empowering leadership is defined as a process of sharing power, and allocating autonomy and responsibilities to followers, teams, or collectives through a specific set of leader behaviors to improve employee internal motivation and achieve work success (Ahearne et al., 2005). Previous meta-analyses showed that empowering leadership is an important resource in relation to employee attitudes (e.g., work engagement, Li, Sun et al., 2021) and performance (e.g., task performance and creativity, Lee et al., 2018). We propose that empowering leadership will strengthen the relationship between motivational demands and challenge appraisals as it entails employees' autonomy and control, which are critical resources for employees. Thus, when experiencing motivational demands, employees are more likely to view these as challenging, and less likely to see them as hindering.

Empowering leadership also can promote challenge appraisals through increasing employee commitment (Gutnick et al. (2012). That is, when employees feel highly committed to the organization, they are more likely to see high motivational job demands as challenges.

Conversely, empowering leadership will mitigate the relationship between motivational demands and hindrance appraisal.

Previous studies also showed that perceived positive leadership moderates the relationship between job demands and appraisal. For instance, LePine et al. (2016) found that charismatic leadership can strengthen the positive relationship between challenge stressors and challenge appraisals. Similarly, Liu et al. (2021) showed that servant leadership strengthens the positive relationship between creative performance pressure and challenge appraisals, whereas it will mitigate the relationship between creative performance pressure

and hindrance appraisals. Additionally, LMX has been suggested as a possible promotor of challenge appraisals (Spurk et al., 2021). Taken together, we suggest that:

Hypothesis 5(a, b): The relationships between motivational demands and appraisals are moderated by perceived empowering leadership during that day, such that on days where employees perceive high empowering leadership, they are more likely to appraise motivational demands as challenging, and less likely to appraise motivational demands as hindering.

Method

Sampling and Procedures

We recruited study participants in China by using a convenience sampling approach (i.e., snowball sampling). To obtain sufficient statistical power, we followed previous suggestions concerning sample size when using experience sampling methods (ESM studies should aim for a Level-2 sample size of at least 83; for Level-1, a sample size of 835 is recommended; Gabriel et al. 2019). Therefore, we decided to recruit at least 100 participants who should provide at least 800 daily measures in total.

Our research design was approved by the institutional ethical committee of the authors' University (IRB number: 20-0600). The data collection was performed in two stages. First, we distributed a one-time, online general survey to collect participants' demographic and background data (i.e., age, gender, education, and whether they have regular interactions with their supervisors). Moreover, online informed consent was obtained. After that, we invited participants to join a WeChat group (a social network platform). As our study focused on daily supervisor behaviors, we only invited participants who indicated that they have interactions with their supervisors to join our daily surveys. Next, we sent daily surveys to

participants across ten working days, asking them to report their daily motivational demands, appraisals, perceived empowering leadership, and creativity per day. Since this was an online survey, we added one item to check the participants' self-reported diligence (i.e., "I verify that I have carefully and honestly answered all questions on this survey"; 1 = strongly disagree to 5 = strongly agree; Meade & Craig, 2012). We sent the daily survey at the end of each workday (i.e., 5 pm), and reminded participants at 8 pm and 10 pm in the WeChat group. 194 participants answered our general survey and 117 participants met our inclusion criteria. These participants collectively completed a total of 972 daily surveys, for an overall daily survey response rate of 83.1%. We deleted the data for daily observations of (a) duplicated answers (i.e., participants who repeatedly answered our survey on the same day, we only kept their first responses, $n = 7$), (b) participants who responded fewer than three times across days ($n = 14$), or (c) careless responses (i.e., failed on the self-reported diligence item, $n = 2$).

After removing these observations, the final sample included 105 participants who provided 949 daily surveys in total. The final sample had an average age of 29.06 years ($SD = 4.74$); 62.5 % were female; and about 66.3% held a bachelor's degree. Their average tenure with the current supervisor was 0.95 years ($SD = 9.95$); they interacted with their supervisors regularly (in total 847 daily observations indicated participants have interactions with their supervisors); on average they worked 45 hours each week. Participants received 100 yuan (the equivalent of 15 US\$) for completing all 10 surveys. They worked in diverse industries.

Within-Personal Level Measurements

Since our participants were located in China, all measurements were translated from English to Chinese by following standard translation-back-translation procedures (Brislin, 1970). Reis and Gable (2000) suggested that daily measures should be as short as possible to increase participation and to minimize intrusive effects. To this end, we used validated short version

scales or selected items based on their factor loadings in our daily measurements. All of the measurement items representing the within-person level were rephrased to the day level.

Unless otherwise stated, we used a 5-point Likert format (1 = “strongly disagree”, 5 = “strongly agree”). Alpha coefficients are presented in Table 2.

Motivational Demands. We used three items from the motivational demands at work scale (Mind @ work) developed by Taris (2019) and validated in various countries, including China (Taris & Hu, 2020). The measurement items are “Today my job required me to set my own goals” (goal setting), “Today my job required me to determine for myself how hard I work” (intensity), and “Today my job required that I myself decide whether I will persist with an activity” (persistence).

Appraisals. We used six items developed by Searle and Auton (2015) that have been validated in Chinese populations (i.e., Li et al., 2020) to measure challenge and hindrance appraisals of motivational demands. Challenge and hindrance appraisals of motivational demand were assessed with three items each. These items of appraisals were measured after the motivational demands and instructed participants to “Think about the above mentioned motivational demands (i.e., the extent to which adequate performance requires you (a) to regulate your efforts at work; to determine (b) how hard you work on a specific task, and (c) how long you work on this task) you are experiencing today. Please now assess how this motivational demand is likely to affect you”. A sample item for challenge appraisal is “will help me to learn a lot” and a sample item for hindrance appraisal is “will restrict my capabilities”.

Empowering Leadership. We used four items to measure daily empowering leader behavior as perceived by the participant (Zhang & Bartol, 2010). For instance “Today, my supervisor solicited my opinion on decisions that may affect me” (consulting); “Today, my

supervisor allowed me to do the job in my way” (delegating). All items were scored on a five-point scale, ranging from 1 (“not true at all”) to 5 (“totally true”). Before employees answered the daily empowering leadership items, one item was added to ask whether he/she had had any kind of interaction with their supervisors today. For those who answered “none” ($n = 102$ daily measures), we treated the score on empowering leadership as a missing value.

Exhaustion. We used four items from the Maslach Burnout Inventory-General Survey (MBI-GS; Maslach et al., 1986) to measure exhaustion. Examples are “Today I felt mentally exhausted because of my job” and “Today working all day long was a heavy burden for me”. (“0” = completely disagree, “6” = completely agree).

Task Performance. We used four items to measure daily task performance developed by Gong et al. (2009). Sample items are “Today I completed job assignments on time” and “Today my work performance met expectations”.

Creativity. We used four items developed by Tierney et al. (1999) to measure daily creativity. Example items include “Today I demonstrated originality in my work” and “Today I found new uses for existing methods or equipment”.

Statistical Analyses

Our repeated measurement data structure violates the assumption of sample independence (Ohly et al., 2010), as our daily measurements ($n = 949$) were nested within individuals ($N = 105$). The preliminary analyses showed that the ICCs ranged from .43 (for motivational demands) to .60 (for empowering leadership) indicating that a significant proportion of variance existed at the within-person level (see Table 2). Thus, we conducted multilevel structural equation modeling with robust full maximum likelihood estimation using Mplus 8.1 (Muthén & Muthén, 1998-2017) to analyze our data. These procedures provide unbiased parameter estimates at the within-person level (Preacher et al., 2010). First, multi-level

confirmatory factor analyses were conducted to test the conceptual distinctiveness of our focal variables (i.e., motivational demands, empowering leadership, challenge appraisals, hindrance appraisals, task performance, exhaustion, and creativity). We compared our hypothesized structures with alternative models (e.g., combining challenge and hindrance appraisal in one factor). Results showed a better fit to the data for a model comprising the seven distinct factors at both the between-person level and within-person level, $\chi^2(462) = 1004.15$, RMSEA = .04, CFI = .94, TLI = .93, SRMR = .04, as compared to the best alternative model, $\Delta\chi^2(17) = 55.61$, $p < .001$. Thus, the results supported the conceptual distinction of the included variables (see Table 1).

Next, we conducted multi-level analyses to test our hypotheses. In particular, in Model 1 we tested an intercept-only model to calculate the intraclass correlation coefficient. Next, we tested the day-level mediation effect of appraisals (Model 2). Third, we added Level 1 interactions and tested day-level moderated mediation effects (Model 3). To test the mediation models, we further used a Monte Carlo-based resampling approach with 10,000 replications in MLmed (Rockwood & Hayes, 2017) as recommended by Hayes and Rockwood (2020). This allowed us to calculate the 95% bias-corrected confidence intervals for the indirect effects. Since all variables were at the lower level, when testing the moderation hypothesis and indirect effects at the within-person level, the predictor and moderator variables were person-mean centered to strictly reflect the intraindividual process (Enders & Tofighi, 2007).

Table 1. *Multi-level Confirm Factor Analyses Results*

Model description		Chi-Square	<i>df</i>	<i>RMSEA</i>	<i>CFI</i>	<i>TLI</i>	<i>SRMR</i>	<i>AIC</i>
Within	Between							
7 factor	7 factor	1004.03	462	< .001	0.04	0.94	0.93	0.04
1 factor	1 factor	5818.84	504	< .001	0.11	0.43	0.38	0.22
7 factor	null	4251.10	531	< .001	0.09	0.60	0.59	0.26
7 factor	independence	2584.70	507	< .001	0.07	0.78	0.76	0.19
7 factor	saturated	2320.36	425	< .001	0.07	0.80	0.74	0.17
7 factor	7 factor: factor invariance	1059.64	479	< .001	0.04	0.94	0.93	0.05
7 factor	7 factor: factor & covariance invariance	1122.72	500	< .001	0.04	0.93	0.93	0.05
7 factor	1 factor	1910.23	483	< .001	0.06	0.85	0.83	0.12
6 factor	6 factor-appraisals as one	1841.88	474	< .001	0.06	0.85	0.83	0.07
6 factor	6 factor-performance & creativity as one	1572.22	474	< .001	0.05	0.88	0.86	0.06

Note: 7 factor-Model = Motivational demands, challenge appraisals, hindrance appraisals, task performance, creativity, and exhaustion. *N* = 949, except for empowering leadership, *N* = 847

Results

Table 2 reports the descriptive statistics, within-and between-person correlations, ICCs, and internal consistency reliability estimates of study variables. Correlations between the focal variables were in the expected direction. In particular, the results in Table 2 show that on a daily basis, motivational demands were positively related to challenge appraisal ($r = .48, p < .01$) and negatively related to hindrance appraisal ($r = -.12, p < .01$). In addition, challenge appraisal was positively related to task performance ($r = .47, p < .01$) and creativity ($r = .58, p < .01$), whereas negatively related to emotional exhaustion ($r = -.10, p < .05$). Hindrance appraisal was negatively related to task performance ($r = -.18, p < .01$) and creativity ($r = -.11, p < .01$), whereas positively related to emotional exhaustion ($r = .47, p < .01$). These results provide initial support for our hypotheses 1 and 2.

Hypothesis Testing

Hypothesis 1 proposed that on a daily basis challenge appraisals of motivational demands will be positively related to employee performance and creativity, whereas they will be negatively related to exhaustion. Table 3 reports the multi-level results. As expected, in Model 2 we found that on a daily basis, challenge appraisal was positively related to task performance ($\gamma = .18, SE = .03, p < .01$) and creativity ($\gamma = .28, SE = .04, p < .01$), whereas it was unrelated to exhaustion ($\gamma = -.01, SE = .04, p = .85$). Thus, the results supported H1a and H1b, whereas H1c was not supported.

Table 2. Means, Standard deviations, Correlations, and Reliability

Variables	ICC	M	SD _w	SD _b	1	2	3	4	5	6	7
1. Motivational demands	.43	3.87	0.74	0.52	(.74)	.57	.56	-.11	.66	.61	-.04
2. Empowering leadership	.60	3.38	0.83	0.66	.47	(.81)	.61	-.16	.69	.73	-.09
3. Challenge appraisal	.46	3.57	0.78	0.56	.48	.47	(.78)	-.30	.64	.79	-.12
4. Hindrance appraisal	.55	2.38	0.91	0.71	-.12	-.12	-.23	(.85)	-.21	-.11	.58
5. Task performance	.49	3.60	0.75	0.56	.48	.58	.47	-.18	(.77)	.67	-.23
6. Creativity	.53	3.18	0.88	0.67	.44	.64	.58	-.11	.51	(.91)	-.01
7. Exhaustion	.52	2.21	1.00	0.76	-.07	-.10	-.10	.47	-.21	-.02	(.95)

Note: Correlations equal or greater than .11 are significant at $p < .01$; Correlations equal or greater than .07 are significant at $p < .05$; The correlations of between-person level and within-person level were reported at the above and below diagonal. For within—person level, $N = 949$, except for empowering leadership, $N = 847$; For between-person level, $N = 105$. Reliability estimates (alpha) between brackets on the diagonal.

Hypothesis 2 (a-c) postulated that on a daily basis, hindrance appraisals of motivational job demands will be negatively related to employee performance and creativity, whereas positively related to exhaustion. The results in Model 2 showed that at the day-level the relationship between hindrance appraisal and creativity ($\gamma = -.04$, $SE = .03$, $p = .18$) was not significant, whereas it was negatively related to task performance ($\gamma = -.06$, $SE = .03$, $p < .05$) and positively related to exhaustion ($\gamma = .34$, $SE = .04$, $p < .01$). Thus, the results supported H2a and H2c, whereas H2b was not supported.

Mediation Results

Hypothesis 3 (a-c) proposed that on a daily basis, challenge appraisals will mediate the relationships between motivational demands and task performance, creativity, and exhaustion. The results in Table 4 showed that on a daily basis, challenge appraisals mediate the positive relationships between motivational demands and task performance ($b = .08$, $SE = .02$, 95% CI: .05, .11) and creativity ($b = .12$, $SE = .02$, 95% CI: .09, .16). However, the indirect effect of challenge appraisal on the relationship between motivational demands and emotional exhaustion was not significant ($b = -.004$, $SE = .02$, 95% CI: -.04, .03). Thus, H3a and H3b were supported, but H3c was not.

Hypothesis 4 proposed that on a daily basis, hindrance appraisals will mediate the relationships between motivational demands and task performance, creativity, and exhaustion. The results showed that on a daily basis hindrance appraisals mediate the relationship between motivational demands and exhaustion ($b = -.05$, $SE = .01$, 95% CI: -.08, -.03) and task performance ($b = .01$, $SE = .01$, 95% CI: .00, .02). However, at day-level the indirect effect of hindrance appraisal on the relationship between motivational demands and creativity was not found ($b = .01$, $SE = .01$, 95% CI: -.04, .02). The bootstrapped results showed similar effects. Thus, the results partially supported H4a and H4c, but H4b was not supported.

Moderation Analysis

Hypothesis 5 proposed that empowering leadership moderates the relationship between motivational demands and appraisals. Table 3 showed significant interaction effects between motivational demands and empowering leadership on challenge appraisals ($\gamma = -.17$, $SE = .04$, $p < .01$) and hindrance appraisals ($\gamma = .10$, $SE = .04$, $p < .05$). We plotted the interaction effects in Figures 2 and 3. Unexpectedly, the results showed that empowering leadership moderates the positive relationship between motivational demands and challenge appraisal, such that the relationship becomes weaker with increasing empowering leadership. In particular, employees tend to appraise high motivational demands as less challenging under high empowering leadership. In addition, we found that day-level empowering leadership moderates the negative relationship between motivational demands and hindrance appraisal, such that the relationship becomes weaker with increasing empowering leadership. Employees tend to appraise high motivational demands as hindering under high empowering leadership. Thus, H5a and H5b were not supported.

Table 3. *Multi-level Linear Modeling Results*

Variables	Model 2					Model 3				
	Challenge appraisal	Hindrance appraisal	Task performance	Creativity	Exhaustion	Challenge appraisal	Hindrance appraisal	Task performance	Creativity	Exhaustion
Motivational demands	.43***	-.16***	.19***	.15***	-.07*	.96***	-.45***	.13**	.05	-.02
Empowering leadership						.01	-.003	.32***	.42***	-.14**
Challenge appraisal			.18***	.28***	-.01			.14***	.24***	.01
Hindrance appraisal			-.06*	-.04	.34***			-.06*	-.05	.29***
Motivational demands * Empowering leadership						-.17*	.10*			

Note: * $p < .05$. ** $p < .01$. *** $p < .001$ (two -tailed). Unstandardized regression coefficients were reported

Table 4. *Bootstrapped Results for Within-Person Level Mediation effects*

Paths	Effect	SE	LL 95% CI	UL 95% CI
Motivational demands → Challenge appraisal → Creativity	.12***	.02	.09	.16
Motivational demands → Hindrance appraisal → Creativity	.01	.01	-.004	.02
Motivational demands → Challenge appraisal → performance	.08***	.02	.05	.11
Motivational demands → Hindrance appraisal → Performance	.01*	.01	.001	.02
Motivational demands → Challenge appraisal → Exhaustion	-.004	.02	-.04	.03
Motivational demands → Hindrance appraisal → Exhaustion	-.06***	.01	-.09	-.03

Note: We used 10000 bootstrapped calculations. SE = Standard error.

* $p < .05$. ** $p < .01$. *** $p < .001$ (two -tailed).

Supplementary Analyses

Although we postulated that on a daily basis appraisals will influence employee outcomes, it is also likely that employee appraisals will have an impact on later employee outcomes (cf. Taris et al., 2021). Accordingly, we conducted a cross-lagged analysis by using Day $t - 1$ appraisals to predict Day t outcomes. The results showed that Day $t - 1$ challenge appraisals are positively related to Day t task performance ($\gamma = .23, p < .01$) and creativity ($\gamma = .23, p < .01$), and that hindrance appraisals are positively related to next-day exhaustion ($\gamma = .15, p < .01$). In conjunction, these results further supported our H1a, H1b and H2c.

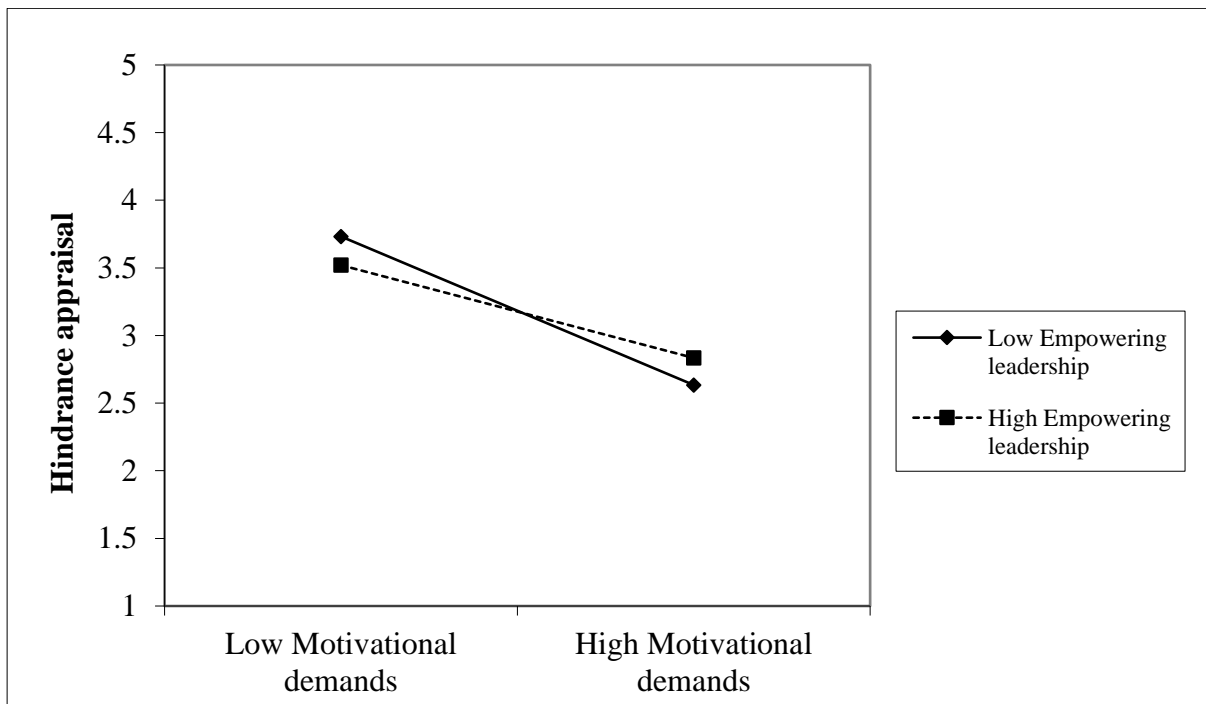


Figure 2. The Interaction Effect Between Motivational Demands and Empowering Leadership on Hindrance Appraisal

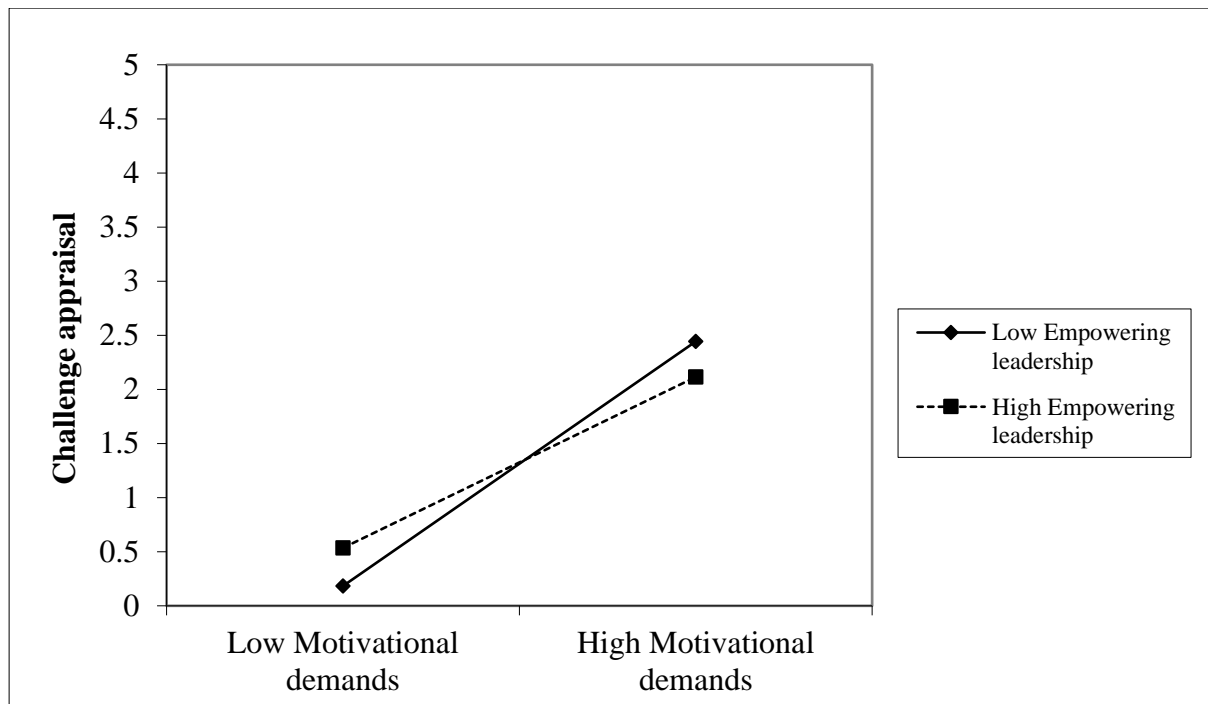


Figure 3. The Interaction Effect Between Motivational Demands and Empowering Leadership on Challenge Appraisal

Discussion

Using an experience sampling study design, we tested the effects of two theoretically relevant mechanisms to show how experiences of motivational job demands may relate to employee performance and well-being. The results partially supported our hypotheses that challenge appraisals of motivational demands are positively related to employee task performance and creativity, whereas hindrance appraisals are positively related to exhaustion and negatively related to task performance. In addition, we found that motivational demands have positive effects on employee task performance and creativity through challenge appraisals, whereas we found negative effects on employee exhaustion through hindrance appraisal. Third, moderator analyses revealed that empowering leadership moderated the relationships between motivational demands and appraisals, such that with increasing empowering leadership, the positive relationship between motivational demands and challenge appraisal becomes weaker,

while the negative relationship between motivational demands and hindrance appraisal becomes weaker. Finally, our supplementary analyses showed a lagged effect of employee appraisals on employee outcomes, which was in line with our expectations.

Theoretical Implications

Our study extends the literature in several ways. First and foremost, it sheds light on the motivational demands literature by revealing when and how such job demands promote or inhibit employee performance and well-being. Although previous studies have revealed that motivational demands and employee outcomes are related (e.g., Taris & Hu, 2020), the theoretical mechanisms that explain these relations had as yet not been studied. Moreover, previous work exclusively investigated the between-person level associations of motivational demands, while ignoring the within-person level. Building on transactional stress theory (Lazarus & Folkman, 1984), our study found that on a daily basis, appraisals are major mechanisms that link work demands to employee outcomes such that through challenge appraisals motivational demands can promote employee performance and creativity. This is in line with previous studies showing that appraisals mediate the relationships between stressors and outcomes (e.g., Ma et al., 2021; Mitchell et al., 2019; Sessions et al., 2019; Spurk et al., 2021). Relatedly, we contribute to the literature on job characteristics theory (Hackman & Oldham, 1980), examining how daily fluctuations in perceived motivational demands relate to employee outcomes through appraisals.

In addition, our study found that motivational demands can reduce employee exhaustion through hindrance appraisals. Although this finding was not a priori expected, it is consistent with previous literature suggesting that when employees perceive work stressors as negative (e.g., as threats or hindrances), they can still have positive outcomes by increasing persistence (e.g., creativity; Gutnick et al., 2012) or by reducing job demands. This implies

that even job demands can trigger hindrance appraisal and that this does not necessarily have detrimental outcomes. The implications of negative appraisal may more complex and ambiguous than we expected. In particular, appraising job demands as hindering can reduce one's motivation or work effort (Liu & Li, 2018), which may have a negative impact on their performance. However, even when experiencing job demands as hindering (through the persistence pathway), employees can achieve high performance by working hard.

Alternatively, employees can reduce their effort, which mitigates the detrimental effect of job demands on exhaustion. For instance, the job crafting literature suggests that by reducing demands, employees can obtain positive outcomes (Wang et al., 2020).

Finally, we contribute to the empowering leadership literature by revealing an undesirable effect of empowerment. Although empowering leadership has been found to have a positive effect on employee outcomes, recently, scholars have started to argue that empowering leadership is not uniformly beneficial, and empirically uncovered the potential unintended negative impact on employees (Cheong et al., 2016; Lee et al., 2018; Wong & Giessner, 2018). For example, Cheong et al. (2016) found that empowering behavior increases employee role stress and further reduces employee work performance. In line with these findings, our study showed that when employees have high motivational demands, empowerment may not be an effective way of leading. In particular, when employees perceive their leaders as high empowering, they are more likely to appraise high motivational demands as hindering and less as a challenge. In this case, empowering leadership may not be effective, and servant or supportive leadership may be more important. For instance, previous studies suggested when employees were not surrounded by their supervisors (e.g., remote work), or in times of crisis, employees increasingly look to their leaders for guidance and support (Antonakis, 2021; Kniffin et al., 2020), the lack of which may lead them to experience more emotional exhaustion (Vander Elst et al., 2017).

Practical Implications

Our study has important practical implications for employees, leaders, and organizations.

First, our study yields important implications for employees regarding addressing motivational demands. Although previous cross-sectional research has linked motivational demands to employee performance and well-being, we found that on a daily basis, motivational demands have positive effects on employee outcomes through challenge appraisals. Moreover, on a daily basis appraisals can also have a lagged effect on later outcomes (i.e., challenge appraisal is positively related to later creativity and task performance; hindrance appraisal is positively related to later exhaustion). These results can help employees in dealing with motivational demands and produce desirable outcomes. For instance, when employees are working from home or are not closely supervised by their leaders, and experience high motivational job demands as well, it is beneficial for them to see these demands as a challenge, as it will help them achieve high task performance and creativity. In particular, during the COVID-19 period, many employees needed to work from home, which may persist when this pandemic is under control. We suggest that it is good for those who work from home to perceive their relatively high motivational demands as challenging (i.e., to perceive them as an opportunity for learning or growth).

Second, our study also sheds light on leaders. Although empowerment has been identified as being beneficial in numerous studies, when employees experience high motivational demands it may be less effective to have empowering leadership. Our study showed that high empowerment can produce undesirable outcomes, which may reduce one's challenge appraisal and promote hindrance appraisal of motivational demands. Our study showed that challenge appraisals may help employees to reach desirable levels of performance and well-being, whereas hindrance appraisals were linked to increased

exhaustion. We therefore suggest that when employees have high motivational demands, supportive leadership may be more desirable for employees than empowerment. For instance, leaders can provide instrumental support and feedback to employees to help them meet high motivational job demands. For organizations, when jobs required high motivational demands, an appraisal-based intervention program could be an option to help employees. Instead of increasing or reducing demands, when one cannot change the situation, a cognition-based self-regulation intervention is recommended. For instance, a previous meta-analysis showed that cognitive-behavioral intervention programs are more effective than others regarding stress management (e.g., relaxation; Richardson & Rothstein, 2008).

Limitations and Future Directions

Our study has several limitations. First, although we used a diary study design with repeated measurements across ten working days, our results cannot be interpreted in causal terms. All of our data are self-reported, and the included variables were measured at the same time in our daily assessment, which may raise a concern of common method bias. This issue was to some extent addressed in our supplementary analysis by testing the corresponding lagged effects. Moreover, our CFAs results supported the discriminant validity of our included variables. Nevertheless, we suggest that future studies use multi-source measurements (e.g., the leader-reported employee task performance and creativity) and separate the measurements of independent variables, mediators and outcomes (e.g., measuring motivational demands and appraisal before lunch while collecting their performance and well-being outcomes at the end of the day) to replicate the results of our study.

In addition, the current study only tested appraisal as major mechanisms linking the motivational demands to outcomes, other possibly important mechanisms were not included. For instance, cognitive rumination has been suggested as an important cognitive mechanism

that links work demands to outcomes (Wang et al., 2013). Similarly, behavioral based regulation, such as job crafting behavior, has been suggested as an important mechanism linking work demands and employee outcomes (Wang et al., 2020). These mediators were not included in our study, thus we suggest that future appraisal studies should include multiple mediators, which will shed important light on the relative importance of theories, and can also provide implications for practical interventions.

Finally, although we tested important contextual factors that may promote or inhibit one's challenge appraisal, possibly important individual factors were not tested. Transactional stress theory suggested that individual factors can influence how one perceives their job stressors as well as shaping their appraisals (Lazarus & Folkman, 1984). In this study, individual factors were not included. Recent studies in appraisal research have shown that individual factors such as trait resilience (Mitchell et al., 2019) and consciousness may act as personal resources that interact with job stressors and appraisals (Ma et al., 2021). Thus, we suggest that future studies should consider both contextual and individual factors that may help organizations to promote challenge appraisals to achieve favorable outcomes and prevent undesirable outcomes.

Conclusion

The current study explored how motivational demands impact employee performance and well-being. Employees who perceived these demands as learning opportunities and as challenging reported high task performance and well-being, whereas hindrance appraisal was related to increased exhaustion and reduced task performance. Our study also showed that cognitive mechanisms have indirect effects that link motivational demands to outcomes. In addition, we found that empowering leadership may have unfavorable effects, such that with

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high empowering leadership, employees are more likely to perceive motivational demands as hindrances and are less likely to see them as challenging.

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Chapter 8

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Chapter 9

Summary and General Discussion

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Work stress is a major factor affecting employee's working lives, as it is linked with their work performance, attitude, as well as physical health (among others, Hobfoll, 1989).

However, the role of appraisals of work stressors has not been well-acknowledged in recent work stressor theories (e.g., the Challenge-Hindrance Stressor Model, Cavanaugh et al., 2000, and resource-based theories such as Hobfoll's Conservation of Resources – COR – model, 1989) and empirical studies. This dissertation therefore aimed to answer the question: *when, how, and for whom do particular types of appraisals of work stressors influence the stressor – outcomes relationships?* Instead of using an a-priori categorization approach of work stressors, building on transactional stress theory (Lazarus & Folkman, 1984) and the challenge-hindrance stressor model (Cavanaugh et al., 2000), we investigated how employees appraise specific work stressors (i.e., time urgency, role clarity, emotional demands, creative performance pressure, and motivational demands); and how such appraisals (i.e., as challenges and/or hindrances) mediate and/or moderate the association between stressors and outcomes. Further, we examined how organizational resources (i.e., servant leadership and empowering leadership) and individual factors (promotion focus) moderated the stressor–appraisals relationships. We used different study designs (cross-sectional, longitudinal, and experience sampling designs) and collected data from multiple sources (employees and supervisors) in China to test our hypotheses.

In this concluding chapter, we summarize the main findings of this dissertation by addressing the six research goals outlined in the first chapter and discussing how our studies advance the current literature of appraisals and work stressors. Next, we discuss the limitations of our studies and provide directions for future research, and provide some suggestions for the practice of the management of work stressors.

Summary of Main Findings per Chapter

In **Chapter 2** we reviewed previous studies of work stressor appraisals and found that different types of appraisals were not exclusive, in that work stressors can simultaneously be appraised as challenges, threats, and hindrances. Challenge appraisals of work stressors (i.e., seeing work demands as opportunities to learn and grow) generally have positive effects on employee work attitudes, well-being, job performance, behavior, and health-related outcomes. Conversely, hindrance, threat, and harm appraisals have negative effects on these outcomes. In addition, although most studies investigated the mediating role of appraisals, our review showed that appraisals can both mediate and moderate the relationships between stressors and work outcomes.

In **Chapter 3** we found that job stressors (i.e., time urgency, role conflict, and emotional demands) can be appraised as both challenges and hindrances. Moreover, the appraisal of stressors as a challenge moderated the associations between these stressors and burnout/engagement. In particular, the results showed that the presence of high job stressors was associated with negative well-being outcomes (i.e., reduced engagement and increased burnout). However, these detrimental effects were weaker if workers appraised these stressors as high-challenge.

In **Chapter 4** we replicated and extended the results of Chapter 3 in two studies. Drawing on the distinction between job demands in the Job Demands-Resources model (Demerouti et al., 2001), we examined whether the effects of job characteristics on outcomes were contingent upon the appraisal of these characteristics. The results of Study 1 in a multi-occupation sample showed that various job demands (time urgency, role conflict, and emotional demands) and job resources (autonomy, supervisor and colleague support, and feedback) can to some degree be appraised as both challenges and hindrances. Job resources

were more likely to be perceived as challenges. In addition, moderation analyses revealed that challenge appraisal mitigated the negative impact of job demands on burnout; and hindrance appraisals can strengthen the detrimental effects of job demands on burnout. Interestingly, the beneficial effect of job resources on employee well-being (i.e., increasing engagement and decreasing burnout) was weaker if workers appraised a certain resource as hindering. Study 2, using a nurse sample, further found that that challenge appraisals of job demands can reduce their impact on burnout while challenge appraisals of job resources will strengthen their positive effect on employee engagement and burnout. These findings on the effects of appraisal broaden existing theories on job characteristics-outcomes relationships.

In **Chapter 5** we used a person-centered approach in a two-wave longitudinal study with a one-year time interval to examine whether there are subgroups of employees who perceive their job stressors similarly. Using latent profile analysis, we identified three distinct profiles of appraisals at two time points (i.e., “positivists”, “negativists”, and “intense workers”). “Positivists” were those who appraised job demands as the highest challenge and lowest hindrance. “Negativists” refer to employees who appraised job demands as low challenges and high hindrances. “Intense workers” report high levels of both challenge and hindrance appraisals. The positivists reported the highest levels of engagement and job satisfaction and the lowest levels of burnout. Interestingly, most participants appeared to change their appraisal profiles across time. In particular, very often from “negativist” and “positivist” to “intense worker”, while moves towards the appraisal profile of “positivist” were relatively rare. In addition, job stressors related to employees' appraisal profiles such that high job demands (e.g., role conflict and time urgency) were positively related to belonging to the negativist workers' profile. Taken together, these results shed light on the nature of the appraisal of work stressors and how employees can be characterized in terms of distinct combinations of appraisal as regards their work demands.

Starting from chapter 6 we also examined the role of leadership in the appraisal of work stress. In **Chapter 6** we aimed to examine how the leadership–employee engagement relationship varies across national cultures, assuming that national culture implicitly affects the way people evaluate – or “appraise” – leadership and its effects on engagement. Using a meta-analytic approach, we found that servant, empowering, ethical, and charismatic leaderships had stronger positive correlations with engagement than other leadership styles, whereas abusive supervision was negatively related to engagement. In addition, we found that several dimensions of national culture (e.g., gender egalitarianism, human orientation, performance orientation, future orientation, and power distance) moderated the leadership–employee engagement relationship. Specifically, the leadership–employee engagement relationship was relatively strong in countries high on future orientation (for ethical leadership and empowering leadership), and low on uncertainty avoidance (for servant leadership). However, high levels of the servant, ethical, and transactional leadership appeared to be most desirable across all countries.

In **Chapter 7** we demonstrated that creative performance pressure is a unique type of work stressor, which can be differentiated from other similar concepts (i.e., performance pressure and creative job requirement). Creative performance pressure has both bright and dark sides, and this translates into differential effects on employee creativity through challenge and hindrance appraisals, respectively. In addition, servant leadership moderated the effect of creative performance pressure on challenge and hindrance appraisals. In particular, servant leadership strengthens the positive relationship between creative performance pressure and challenge appraisal and mitigates the negative relationship between creative performance pressure and hindrance appraisal. Furthermore, challenge and hindrance appraisals transmit the beneficial and detrimental effects of creative performance pressure to creativity, respectively. Similarly, promotion focus moderated the relationship between

creative performance pressure and hindrance appraisal, such that individuals with low promotion focus were more likely to view creative performance pressure as hindering.

In **Chapter 8** we found that daily motivational demands predicted daily creativity and task performance positively, both directly and indirectly (through challenge appraisal). Similarly, such demands negatively predicted exhaustion both directly and indirectly (through hindrance appraisal). In addition, we found that daily empowering leadership moderated the relationship between daily motivational demands and appraisals. When employees perceived their leaders as high-empowering, they were more likely to view motivational demands as hindering and were less likely to see them as challenging.

Main findings in relation to the research aims. Table 1 presents a summary of the six research aims of this thesis, the chapters relevant to these aims, and the most important findings. As this table shows, in Chapters 3-5, 7, and 8 we investigated how employees appraised work stressors in the Chinese context, showing that work stressors can be appraised as both challenges and hindrances in this non-western culture. This achieved our first research purpose of whether and how work stressors are appraised in China. In addition, in Chapters 3 and 4 we tested and confirmed the moderating effect of appraisals in the relationship between work stressors and employee well-being (work engagement and burnout), which achieved our second research goal of whether appraisals can serve as a moderator of stressor-outcome relationships.

Third, in Chapter 7 we tested the double-edged sword effect of creative performance pressure on employee creativity through challenge and hindrance appraisals, which achieved our third research aim of investigating the double-edged sword effect of appraisals. Similarly, in Chapter 8 we showed that daily motivational demands positively predicted daily creativity

and task performance through challenge appraisal, whereas it negatively predicted exhaustion through hindrance appraisal.

Fourth, in Chapters 7 and 8 we examined whether leadership (servant leadership and empowering leadership) and individual factors (in this case, promotion focus) acted as moderators of the relationship between work stressors and appraisals. The results indicated that leadership and individual factors indeed moderate some of the relationships between work stressors and outcomes. This answered our research question: what are the boundary conditions between work stressors and appraisals? Finally, we tested the daily appraisals of an emerging work stressor (i.e., motivational job demands), and showed that daily appraisals of this stressor related to employee daily outcomes (task performance, creativity, and exhaustion), which achieved our last research goal of examining the daily appraisals of emerging work stressors.

Table 1. *A Summary of Research Goals*

Aims	Relevant chapters	Results
1. Assessing whether and how job stressors are appraised in China.	2, 3, 4, 5, 7, 8	Role conflict, time urgency, emotional demands, creative performance pressure, motivational demands were appraised as both challenges and hindrances in China.
2. Testing whether appraisals can serve as a moderator of stressor–outcome relationships.	2, 3, 4	Appraisals moderated the relationship between job stressors and well-being (work engagement and burnout).
3. Investigating the double-edged sword effect of appraisals.	2, 7,8	Creative performance pressure influenced employees’ creativity through challenge and hindrance appraisals.
4. Investigating the boundary conditions (i.e., leadership and individual factors) of the associations between work stressors and appraisals.	2,7,8	Servant leadership, empowering leadership, and promotion focus moderated the stressor–appraisals relationships.
5. Using a variable-centered approach to examine appraisals and to examine how different combinations of appraisals influence employee outcomes.	5	There are three subgroups of employees (i.e., “positivists”, “negativists”, and “intense workers”) that showed different levels of well-being in terms of job satisfaction, work engagement, and burnout.
6. Assessing daily appraisals of emerging work stressors (i.e., motivational demands).	2, 8	Motivational demands vary across days and are related to employees’ day-level outcomes.

Theoretical Implications

By expanding upon and complementing previous empirical findings on work stress, the present thesis has both theoretical and methodological implications. First and foremost, we contribute to the challenge-hindrance stressor framework by investigating how individuals appraise particular job stressors. Although Hobfoll (1989) suggested that there is broad agreement as to what is stressful, this thesis convincingly showed that not all work stressors are perceived similarly by individuals, and it can be both appraised as challenging and hindering to varying degrees. Importantly, in line with previous studies (Searle & Auton, 2015), we found that appraisal explained unique variance in a wide variety of employee outcomes (e.g., work engagement and burnout) beyond what was already accounted for by work stressors. These results imply that current job stressor models (such as the CHSM, Cavanaugh et al. 2000, and the JD-R, Bakker & Demerouti, 2017) will benefit by integrating appraisals. In addition, Cavanaugh et al. (2000) argued that by appraising a particular stressor as positive and then evaluating a positive outcome, the chances of finding a positive link may be inflated because of the semantically synonymous items (Crampton & Wagner, 1994). In this dissertation, we therefore also used other-reported outcomes (e.g., supervisor-reported creativity), we included both positive and negative outcomes (e.g., exhaustion and creativity), and we also tested the double-edged indirect effects of challenge and hindrance appraisals on the relationship between work stressor and positive outcomes (creativity). Our results were in line with a dual-path model of stressors-outcomes, with one path linking stressors to outcomes through challenge appraisals, the other path linking stressors and outcomes through hindrance appraisals. Due to the precautions taken when examining the linkages between stressors, appraisals and outcomes, it is unlikely that the indirect effects of appraisal are merely the result of percept-percept bias (Crampton & Wagner, 1994).

Second, this dissertation advances our understanding of the role of appraisals in the work stressors – outcomes relationships. Most previous research in this area revealed that appraisals are major mechanisms that link job stressors and employee outcomes, and this dissertation supported this argument in several studies by showing that appraisals can mediate the relationship between creative performance pressure and creativity, and the relationship between motivational demands and employees' outcomes (i.e., task performance and creativity). Our findings are consistent with previous studies (e.g., LePine et al., 2016; Liu & Li, 2018). In addition, building on person-context theory, we showed that appraisals, as an individual difference variable, can also moderate the relationship between work stressors and outcomes. Therefore, this dissertation contributes to transactional stress theory (Lazarus & Folkman, 1984) and person-context interaction theory by examining cognitive appraisal as a contextual factor that is relevant to the relationship between job stressors and employee well-being. This extends our understanding of the role of appraisals (i.e., they not only serve as a mediator but can also be a moderator of stressor-outcome relationships).

Third, this dissertation sheds light on the nature of appraisals (i.e., as a stable trait or a state). In Chapters 3 and 4, we showed that appraisals can be an individual difference variable (i.e., trait-like), which to some extent supported the assumed stability of appraisals (Skinner & Brewer, 2002). However, in a longitudinal study (Chapter 5) we also found that employees changed their appraisal profiles across a one-year interval, which sheds light on the longitudinal changes of appraisals. Moreover, in a diary study (Chapter 8) we found that daily appraisals of motivational demands vary across days and influence individuals' daily task performance and creativity. These results showed that appraisals are, to some extent, stable as an individual trait-like variable, but for certain situational stressors it appears that they can also change across time. This sheds light on the measurement of appraisals. Apparently, a single-time measurement of appraisals cannot truly capture the dynamic status of appraisals,

and more state-of-the-art multi-wave designs, such as experience sampling methods or diary studies (Bolger et al., 2003), should be employed for future research on the appraisals of job stressors.

Fourth, we used a person-centered approach in Chapter 5 to investigate the different profiles of appraisals. Although there is a growing interest in appraisal research, the majority of studies in this area used a variable-centered approach. Our study showed differences in appraisals of job stressors within a group of employees who would in regular, variable-focused research be treated as a homogeneous group. In particular, we showed the existence of three latent groups of employees (i.e., positivists, intense workers, and negativists) that differed in their appraisals of job stressors. For instance, positivists see job demands as high-challenging and low-hindering. On the one hand, this shows that individuals vary in the way they typically appraise stressors. On the other hand, this finding further supports the notion that different appraisals are not mutually exclusive (Lazarus & Folkman, 1984). Notably, our study in Chapter 5 is the first empirical study to examine the combined effect of appraisals of job stressors by using a person-centered approach and how these combined challenge and hindrance appraisals relate to outcomes. Further, we validated the latent profiles by showing how different appraisal profiles relate to employee well-being. For instance, positivists showed higher well-being than negativists and intense workers. Thus, we provide a new perspective to understanding appraisals of work stressors.

Finally, this dissertation supported the important role of leadership in employees' working life. In a meta-analysis, we found that leadership is related to employee engagement. Whereas destructive leadership has a detrimental effect on employee engagement, positive leadership types (e.g., servant, ethical, and transformational) are positively linked to employee engagement, task performance, and creativity. In addition, we revealed that servant leadership promotes challenge appraisals of work stressors, such that employees led by servant-type

leaders tend to appraise creative performance pressure as challenging, whereas they are less likely to see it as hindering. Unexpectedly, we found that empowering leadership is not a desirable leadership style when employees experience high motivational demands. Thus, consistent with prior studies (e.g., LePine et al., 2016), our results contribute to the literature by highlighting the role of leadership in shaping employee work stressor experience and their outcomes.

Limitations and Directions for Future Research

This dissertation has several limitations, which can to some degree also be perceived – or *appraised* – as opportunities for future research. First and foremost, we exclusively tested our hypotheses by using survey designs and mostly used same-time measurements and self-reported data. The results may suffer from endogeneity bias, i.e., the effect of predictors on outcomes cannot be interpreted in causal terms, because this effect may be biased by omitted causes/third variables (Antonakis et al., 2010) and common method bias (Podsakoff et al., 2012). Thus, despite their significance, our findings cannot be interpreted as reflecting true causal relationships. Future studies can use experimental study designs to test the causal direction of these effects. For instance, researchers could create a stressful situation and manipulate employees' appraisals (providing participants with instructions to either focus on the positive side that is, to see the potential benefits of the situation; or on their hindering aspects that is, to perceive the situation as thwarting or hindering achievement of one's valued goals). In this way, it may be possible to examine experimentally how different appraisals of work stressors influence participants' performance and well-being.

In addition, several of the studies in this dissertation (Chapter 3 and Chapter 4) used cross-sectional designs. Obviously, these designs did not allow us to test the possibly reversed or reciprocal effects between work stressors and appraisals (Taris et al., 2021). For instance, it

is possible that if employees currently see a situation as having positive outcomes, they are more likely to see the situation as challenging in the future, which could in turn produce further desirable outcomes (i.e., the “gain spirals” effect, Hakanen et al., 2008). Thus, future research should use longitudinal designs to investigate the possible reciprocal relationships between work stressors, appraisals, and outcomes in examining the causal effects of the study variables.

Second, most of the stressors included in our studies are subjective stressors (i.e., time pressure, role conflict, emotional demands, creative performance pressure, and motivational demands). It is unclear how employees appraise objective work stressors. We believe that subjective stressors are worth investigating, however, only focusing on such stressors and their appraisals may produce undesirable outcomes, as the objective/environmental component is removed from stress research (Hobfoll, 1989). Therefore, we recommend that future studies also focus on objective stressors and investigate how employees appraise these stressors. For instance, how employees appraise the number of hours of overtime work, the number of customers a service worker needs to take care of, or the number of patients a nurse needs to take care of. In the same vein, it would be good to include other ratings of outcome variables, such as data from the supervisors or colleagues.

Third, the studies presented in Chapters 8 and 9 found that appraisals mediate the stressor-outcomes relationships. However, it is still not clear whether the appraisal mechanisms studied in these chapters had stronger effects than other, possibly competing theoretical mechanisms. So far, empirical research of appraisals has rarely considered other potential mechanisms that could link work stressors and outcomes. In Chapters 8 and 9, we tested cognitive mechanisms, however, we did not consider other alternative mechanisms (e.g., behavioral mechanisms, such as using job crafting to increase challenging stressors and reduce hindering stressors). This is critical, as comparing different mechanisms will shed light

on theoretical development and show the relative importance of theories in accounting for particular phenomena (Leavitt et al., 2010). Thus, future studies may focus on comparing different mechanisms. This will provide theoretical implications as well as practical implications relevant to addressing work stressors.

Fourth, although we investigated between-person level appraisals and within-person level appraisal in this dissertation, we did not test potential higher-level (e.g., team-level) appraisals, meaning that it remains unclear whether team-level appraisals will influence team outcomes. Empirical studies have shown that team-level problem prevention moderates the relationship between individual-level problem-solving demands and individual appraisals (e.g., Espedido, et al., 2019). Building on social learning theory (Bandura & McClelland, 1977), it is highly possible that employees will learn how to appraise stressful work situations by learning from their supervisors and colleagues. Thus, future research can investigate this possibility.

Finally, although we extended previous research that mainly investigated appraisals in western countries (e.g., LePine et al., 2016), we only used samples from a single country (China in this dissertation). This should be considered as a limitation as it raises concerns about the external validity of our findings, in that these may largely reflect the Chinese specific context and may not generalize to different nations. However, our studies were based on theoretical arguments (e.g., Cavanaugh et al., 2000; Lazarus & Folkman, 1984), and our results were largely consistent with studies conducted in Western countries (e.g., LePine et al., 2016). Although this might relieve these concerns, it is still desirable for future research to replicate and extend these findings in other countries.

Practical Implications

This dissertation also provides important implications for employees, leaders, and organizations. First, for employees, we suggest that looking on the bright sides of their work stressors (i.e., challenge appraisal) is important. Across our dissertation, the results consistently supported the idea that challenge appraisals of work stressors are positively related to employee well-being (work engagement and reduced burnout) and performance (task performance and creativity). In addition, challenge appraisals can also buffer the detrimental effects of work stressors on employee well-being, while work stressors can potentially have beneficial effects through challenge appraisals. Besides, the results of the latent profile analyses in Chapter 5 showed that positivists (i.e., seeing work stressors as highly challenging and low hindering) showed the highest well-being (e.g., job satisfaction and work engagement), as well as that appraisals tend to be subject across time – appraisals are not necessarily stable across time. Thus, when experiencing job stressors, employees are encouraged to perceive it as an opportunity to learn and grow. Note that this does not mean we want to trivialize the effects of work stress nor do we want to suggest that victims of work stress should blame themselves; we do want to emphasize that good job design is still the best way to prevent work stress (Grant & Parker, 2009). However, at the same time it should be noted that workers can to some degree improve the characteristics of their jobs (e.g., through job crafting, Tims et al., 2013), meaning that they do not necessarily need to be the passive recipients of the adverse influence of a badly designed job.

Second, for leaders, it is suggested that they embrace positive leadership styles and avoid destructive leading behaviors (e.g., abusive supervision). This dissertation confirms the positive associations of employing positive leadership styles with employee engagement, task performance, and creativity, and the negative association between abusive supervision and employee engagement. The strongest relations with engagement were found for servant

leadership, ethical leadership, and empowering leadership. Leaders who wish to increase employee engagement and performance may therefore consider broadcasting these positive leadership styles and avoiding abusive supervision behaviors. Leadership training may be instrumental in helping them change towards a more positive leadership style, as it has been demonstrated that leadership training programs are effective (Lacerenza et al., 2017) and leaders' positive leadership behavior can create better performing employees (Wijewardena et al., 2014).

Third, leadership can provide useful resources for employees to address their work stressors, as we found that servant leadership can promote employee challenge appraisal. If employees perceive their leaders as truly serving their employees, they are more likely to see creative performance pressure as challenging and are less likely to see it as hindering. Therefore, leaders need to truly motivate themselves to serve employees and to create a working environment that promotes employee challenge appraisals of creative performance pressure. Besides, as we found that there are positivists, negativists, and intense workers, leaders should realize that employees may perceive job stressors differently. So when promoting job demands to employees, leaders may emphasize the potential benefits and the opportunities for growth offered by particular demands when communicating with their subordinates.

Finally, when focusing on the selection process, it may be beneficial for organizations to hire employees who tend to appraise specific demands that pertain to a particular job as a challenge. For example, if a job requires working in a highly creative performance pressure context, recruiting individuals who tend to appraise that pressure as highly challenging will benefit both the organization and the employee. Organizations may use training programs to develop employees' cognitive appraisals to reduce their levels of work stress. For instance, a cognitive-based training program was found to be effective in reducing burnout (Gavelin et

al., 2015). In addition, since we found that employees who appraise their job demands as high-challenging and low-hindering showed high levels of job satisfaction and work engagement and low levels of burnout, it seems important for organizations to create a climate in which it becomes possible for employees to appraise their job demands as challenging, for instance, by emphasizing the potential gains and achievements of job demands. Note that although appraisals can buffer the detrimental effects of job demands, job demands still require energy expenditure, and challenge appraisals may hard to achieve across longer periods (Mazzola & Disselhorst, 2019). Thus, employees (challenge appraisal), organizations (good job design), and leaders (provide work resources and promote positive leadership behaviors) should work together to help employees make a better work life.

Conclusion

Studies on the nature and consequences of job stressors usually assume that all employees experience a particular stressor in a similar way. However, in this dissertation, I demonstrated that employees can experience job stressors as challenging and hindering at the same time and to varying degrees. The appraisals of these stressors can act as both mediators and moderators of stressor-outcomes relationships. Challenge appraisals can buffer the negative effect of work stressors on outcomes and can transform the positive effect of a particular work stressor on individual performance and creativity). Hindrance appraisals can transform the negative effect of a particular work stressor on individual outcomes (e.g., creativity). In addition, employees' appraisals tend to change over time. Practitioners are encouraged to consider promoting a challenge appraisal of job stressors as this type of appraisal is linked to positive attitude, performance, creativity, and low burnout. Moreover, it is still a responsibility for leaders and managers to provide for a good job design and a work climate in which it is both safe and possible to appraise work stressors as challenging. Leaders should display positive leadership styles (e.g., servant leadership) and help workers to look on the bright sides of working life.

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Nederlandse samenvatting

In **Hoofdstuk 2** werd eerder onderzoek naar de beoordeling/appraisal van werkstressoren bekeken. We ontdekten daarbij dat verschillende soorten beoordelingen niet exclusief waren, in de zin dat werkstressoren tegelijkertijd kunnen worden beoordeeld als uitdagingen, bedreigingen én belemmeringen. Wanneer werkstressoren worden beoordeeld als een uitdaging (d.w.z. dat de werkeisen worden gezien als kansen om te leren en te groeien), dan hebben ze over het algemeen positieve effecten op de werkattitudes, het welzijn, de werkprestaties, het gedrag en de gezondheidsgerelateerde uitkomsten van werknemers. Wanneer werkstressoren echter worden beoordeeld als een hindernis, bedreiging of belemmering, dan zijn deze uitkomsten negatief. Hoewel de meeste studies de mediërende rol van beoordelingen hebben onderzocht, toonde onze review bovendien aan dat beoordelingen de relaties tussen stressoren en werkresultaten zowel kunnen mediëren als modereren.

In **Hoofdstuk 3** zagen we dat werkstressoren (d.w.z. tijdsdruk, rolconflicten en emotionele eisen) als zowel uitdagingen als belemmeringen kunnen worden beschouwd. Bovendien modereerde de beoordeling van deze stressoren als een uitdaging de associaties tussen deze stressoren en burn-out/betrokkenheid. De resultaten toonden met name aan dat de aanwezigheid van hoge werkstressoren geassocieerd was met negatieve welzijnsuitkomsten (d.w.z. verminderde betrokkenheid en verhoogde burn-out). Deze nadelige effecten waren echter zwakker als werknemers deze stressoren als een uitdaging in plaats van een belemmering beschouwden.

In **Hoofdstuk 4** hebben we de resultaten van Hoofdstuk 3 gerepliceerd en uitgebreid in twee studies. Op basis van het onderscheid tussen taakeisen in het Job Demands-Resources-model (Demerouti et al., 2001), hebben we onderzocht of de effecten van taakkenmerken op de uitkomsten afhankelijk waren van de beoordeling van deze kenmerken. De resultaten van Studie 1 (gebaseerd op een steekproef met meerdere beroepen) toonden aan

dat verschillende werkeisen (job demands: tijdnoed, rolconflict en emotionele eisen) en werkbronnen (resources: autonomie, ondersteuning van supervisors en collega's, en feedback) tot op zekere hoogte kunnen worden beoordeeld als zowel uitdagingen als hindernissen.

Hulpbronnen op het werk werden eerder gezien als uitdaging. Bovendien bleek uit moderatieanalyses dat de negatieve impact van taakeisen op burn-out zwakker was, als deze taakeisen als uitdagingen werden beoordeeld. Op dezelfde manier werden de nadelige effecten van taakeisen op burn-out versterkt als deze taakeisen als een belemmering werden gezien.

Interessant is dat het gunstige effect van werkhulpbronnen op het welzijn van werknemers (d.w.z. toenemende betrokkenheid en vermindering van burn-out) zwakker was, als werknemers een bepaalde hulpbron als hinderlijk beschouwden.

Studie 2, waarbij gebruik werd gemaakt van een steekproef van verpleegkundigen, liet verder zien dat het beoordelen van taakeisen als een uitdaging de negatieve impact van hoge taakeisen op burn-out kan verminderen, terwijl het beoordelen van arbeidsbronnen als een uitdaging de positieve impact van arbeidsbronnen op werknemersbetrokkenheid en burn-out versterkte. Deze bevindingen over de effecten van beoordeling verbreden bestaande theorieën over de relaties tussen baankenmerken en uitkomsten.

In **Hoofdstuk 5** gebruikten we een persoonsgerichte benadering in een longitudinaal onderzoek bestaande uit twee meetmomenten met een tijdsinterval van een jaar, om te onderzoeken of er subgroepen van werknemers zijn die hun werkstressoren op dezelfde manier ervaren. Met behulp van latente profielanalyse identificeerden we drie verschillende profielen van beoordelingen op twee tijdstippen ("positivisten", "negativisten" en "intense werkers"). "Positivisten" waren degenen die de taakeisen vooral als uitdagend en niet zozeer als belemmerend beoordeelden. "Negativisten" verwijzen naar werknemers die werkeisen beoordeelden als weinig uitdagend en vooral als belemmerend. "Intensieve werkers" rapporteren hoge niveaus van zowel uitdaging als belemmering. De positivisten rapporteerden

de hoogste niveaus van betrokkenheid en werktevredenheid en de laagste niveaus van burn-out. Interessant is dat de meeste deelnemers hun beoordelingsprofielen in de loop van de tijd leken te veranderen. We zagen vooral vaak verandering van “negativist” en “positivist” naar “intense werker”, terwijl bewegingen in de richting van het beoordelingsprofiel van “positivist” relatief zeldzaam waren. Bovendien waren werkstressoren gerelateerd aan de beoordelingsprofielen van werknemers, zodat hoge taakeisen (bijvoorbeeld rolconflict en tijdsdruk) vooral vaak voorkwamen bij een negativistisch werknemersprofiel. Alles bij elkaar werpen deze resultaten licht op de aard van de beoordeling van werkstressoren en hoe werknemers kunnen worden gekarakteriseerd in termen van verschillende combinaties van beoordelingen met betrekking tot hun werkeisen.

Vanaf **Hoofdstuk 6** is ook de rol van leiderschap bij de beoordeling van werkstress onderzocht. In Hoofdstuk 6 bekeken we hoe de relatie tussen leiderschap en werknemerbetrokkenheid (“work engagement”) varieert tussen nationale culturen, ervan uitgaande dat de nationale cultuur impliciet van invloed is op de manier waarop mensen leiderschap evalueren – of “beoordelen” – en de effecten ervan op betrokkenheid. Met een meta-analytische benadering ontdekten wij dat dienend, empowerend, ethisch en charismatisch leiderschap sterkere positieve correlaties hadden met betrokkenheid dan andere leiderschapsstijlen, terwijl destructief (“abusive”) leiderschap negatief gerelateerd was aan betrokkenheid. Daarnaast ontdekten wij dat verschillende dimensies van de nationale cultuur (bijv. gendergelijkheid, menselijke oriëntatie, prestatiegerichtheid, toekomstgerichtheid en machtsafstand) de relatie tussen leiderschap en werknemerbetrokkenheid modereerden. Specifieker gezegd, de relatie tussen leiderschap en werknemerbetrokkenheid was relatief sterk in landen die hoog scoorden op toekomstgerichtheid (voor ethisch leiderschap en empowerend leiderschap) en laag op onzekerheidsvermijding (voor dienend leiderschap). Een

hoog niveau van dienend, ethisch en transactioneel leiderschap bleek echter in alle landen het meest wenselijk.

In **hoofdstuk 7** hebben we aangetoond dat creatieve prestatiedruk een uniek type werkstressor is, die kan worden onderscheiden van andere vergelijkbare concepten (meer specifiek, prestatiedruk en creatieve baanvereisten). Creatieve prestatiedruk heeft zowel mooie als slechte kanten, en dit vertaalt zich in verschillende effecten op de creativiteit van werknemers, afhankelijk van de mate waarin creatieve prestatiedruk als een uitdaging dan wel als een belemmering werd beoordeeld. Daarnaast modereerde dienend leiderschap het effect van creatieve prestatiedruk op de beoordeling van uitdagingen en belemmeringen. In het bijzonder versterkt dienend leiderschap de positieve relatie tussen creatieve prestatiedruk en uitdagingsbeoordeling en verzacht het de negatieve relatie tussen creatieve prestatiedruk en belemmeringsbeoordeling. Bovendien brengen uitdagings- en belemmeringsbeoordelingen de respectievelijk gunstige en nadelige effecten van creatieve prestatiedruk over op creativiteit. Op dezelfde manier modereerde promotiefocus de relatie tussen creatieve prestatiedruk en belemmeringsbeoordeling, zodanig individuen met een lage promotiefocus een hoge creatieve prestatiedruk vaker als belemmerend beschouwden.

Hoofdstuk 8 liet zien dat op dagniveau gemeten motivatie-eisen de dagelijkse creativiteit en taakuitvoering positief voorspelden, zowel direct als indirect (via de mate waarin deze eisen als uitdaging werden beoordeeld). Verder voorspelden dergelijke eisen uitputting zowel direct als indirect (door middel van beoordeling van hindernissen). Daarnaast vonden wij dat dagelijks gemeten empowerend leiderschap de relatie tussen dagelijkse motivatie-eisen en beoordelingen modereerde. Wanneer werknemers hun leiders als sterk empowerend zagen, waren ze eerder geneigd om motiverende eisen als hinderlijk te zien en minder als uitdagend.

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Curriculum Vitae

Peikai Li was born on the 25th, December 1990 in Gansu, China. He studied Administration Management and got a Bachelor degree in 2012 at North China Institute of Science and Technology. From 2014 to 2017, he studied Applied Psychology in Beijing and obtained a master's degree at Renmin University of China. Since September 2017, he started his Ph.D. in the department of Social, Health and Organizational Psychology at Utrecht University.

Research Interests

Peikai conducts research in the area of work and health psychology. His research mainly focuses on the appraisal of job characteristics (or stressors), leadership, newcomer socialization, and creativity.

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