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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 survey (Study 1, $n = 514$), we found that job characteristics of "demands" (time urgency, role conflict, and emotional demands) and "resources" (autonomy, supervisor and colleague support, and feedback) can to some degree be appraised as both challenges and hindrances. In addition, moderation analysis showed that challenge appraisal can mitigate the negative impact of job demands on burnout. Interestingly, the beneficial effects of job resources on employee well-being (i.e., increasing engagement, and decreasing burnout) were weaker if workers appraised a certain resource as hindering. In Study 2 ($n = 316$ nurses in a hospital), the results generally supported our predictions again. These findings on the effects of appraisal contribute by broadening the theory on job characteristics-outcomes relationships.

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

Although scholars in the work and organizational psychology domain have often classified job characteristics as either job demands or job resources (e.g., the Job Demands-Resources model, Demerouti et al., 2001; this distinction has not remained unchallenged. Drawing on stress research (and especially on Cavanaugh et al.'s Challenge-Hindrance Stressor Framework, 2000), organizational researchers have expanded traditional job characteristics theory (e.g., the JD-R model, Demerouti et al., 2001; and the Job Demand-Control model, Karasek, 1979) by recategorizing job demands as either challenge or hindrance demands (e.g., van den Broeck et al., 2010; Teng et al., 2020). 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 (González-Morales & Neves, 2015; Parker, 2014). Thus, how different appraisals of work characteristics (i.e., as challenges or hindrances) relate to employee well-being still needs further investigation.

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., 2020; Li et al., 2017), we propose that appraisals may influence the magnitude or even the nature of job demands and job resources, as well as their

relationships with 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. Specifically, since many previous researchers have categorized job characteristics as either a demand or a resource (Bakker & Demerouti, 2017), we will investigate how employees appraise selected "demands" and "resources" – i.e., as a challenge and/or a hindrance. Accordingly, we 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). Based on person-context interaction theory (Magnusson & Stattin, 1996), 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, a positive workplace climate, 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 results suggested that employees are more engaged if they have a high workload and high time demands. Therefore, these findings suggest a need to look at 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 effort 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), 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 concurrently have challenging and hindering aspects (Webster et al., 2011). 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 appraisal 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, the 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 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 gain, 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). 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). Therefore, appraisal has the potential to influence employee well-being.

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). For example, Webster et al. (2011) found that appraisals mediate the relationship between demands and strains, job satisfaction, and turnover intentions. Similarly, Searle and Auton (2015) reported that time pressure indirectly influenced positive affect via challenge appraisals (for similar findings, see also Boswell et al., 2004; Liu & Li, 2018; Mitchell et al., 2019; Sessions, Nahrgang et al., 2019; Tuckey et al., 2015). Extending these findings, we build on appraisal theory and person-context theory (Magnusson & Stattin, 1996) to propose that appraisal can also serve as a moderator. Work in general is taxing on personal resources (Demerouti et al., 2001), but if workers who appraise a particular 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 self-regulatory effectiveness in dealing with job demands (Brown et al., 2001). On the other hand, high challenge appraisal has been established as an adaptive function in dealing with stressful event, 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. Consistent with this reasoning, priori studies have demonstrated that appraisals moderate the relationship between stressors and outcomes. In a study among Chinese workers, Li et al. (2020) found that the associations between job demands (time urgency, role conflict, and emotional demands) and well-being were more negative if workers appraised these demands as less challenging. Similarly, Hewett et al. (2018) demonstrated that individuals who are subject to work-related negative acts but do not see themselves as being bullied report higher levels of performance than others and that appraisals serve as a moderator of this relationship (Li et al., 2017; Hewett et

al., 2018; Koopmann et al., 2018, for similar findings). Thus, we propose that appraisals can also serve as a moderator.

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, role conflict and emotional demands are not consistently categorized as a challenge or a hindrance (e.g., Albrecht, 2015; Bakker & Sanz-Vergel, 2013; Crawford et al., 2010; Wincent & Örtqvist, 2011), whereas time urgency is generally seen as a challenge demand (Li et al., 2020). Although time urgency was more frequently categorized as a challenge demand, according to a meta-analysis (Mazzola & Disselhorst, 2019) and other empirical studies (e.g., Baethge et al., 2019; Gabriel et al., 2019; Kronenwett & Rigotti, 2019; Li et al., 2020), we expect a negative link between time urgency and work engagement. For instance, Baethge et al. (2019) found that between-person level time pressure was negatively related to work engagement; Kronenwett & Rigotti (2019) also supported such a negative link. In summary, we propose that:

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 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, what the effects of exposure to these job demands will be. 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, 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. PE fit theory states that if environmental resources such as control are not compatible with employees' standards, employees will experience misfit and, consequently, a decrease of 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). Another explanation for the detrimental effect of resources draws on how employees appraise their resources. As Wielenga-Meijer et al. (2011) argued, the reason why autonomy fosters people's motivation to learn is possibly 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, and the job demands and resources are sometimes not mutually exclusive (Schaufeli & Taris, 2014). When an employee experiences a lack of resources, this might imply that (s)he 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), it is possible that 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. 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, as aforementioned, individual differences in appraisal may moderate the demands–well-being relationship. In a similar vein, we argue that the magnitude of the job resources–well-being relationship will also 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. For example, high levels of autonomy are likely to turn into "unavoidable requirements" that it creates a seemingly intractable information problem, and it is hard enough to gather information and make 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 hypothesized motivational effects of this resource. Therefore, we hypothesize that challenge and hindrance appraisals moderate the relationship between job resources and employee well-being. Hence, we propose that:

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 weaker 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. First, to demonstrate that appraisal moderates the effects of job characteristics, in Study 1, we tested our hypotheses by asking employees' *general* appraisal of certain job characteristics (i.e., referring to a hypothetical situation) using a sample of working adults from multiple organizations. In Study 2, we tested the moderation predictions of appraisals 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, Qualtrics, and StudyResponse. We followed the procedures recommended by Porter et al., (2018) to collect the online data. Specifically, participants received an introductory mail 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 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%). Employees worked in different branches, including online commerce (17.9%), real estate/construction (9.9%), energy/aerospace/chemical industry (8.6%), communications/telecom operations (8.2%), education (8.0%), transportation (7.6%), entertainment/travel (6.8%), clothing/textile (5.6%), finance, medical, advertising, or agriculture (12.5%), and other sectors (15%).

Measurements

All questionnaires were in Chinese. If possible, we used validated Chinese scales to measure the variables. Otherwise, we followed the back-translation process to ensure the semantic equivalence (Brislin et al., 1973). 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. Three of these were adapted from Maruping et al. (2015), including "The amount of time provided to complete my tasks is short". 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* 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". *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*).

Job Resources. *Colleague support* was measured with 4 items from Peeters et al. (1995), tapping emotional support, appraisal support, instrumental support and informative support. A sample item is “If needed, my colleagues help me with a certain task” (1= *never* and 5 = *often*). For *supervisor support*, we used the same items but replaced "colleague" with "supervisor". 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”. Two other items from the WDQ were used to assess *autonomy*, including “The job provides me with significant autonomy in making decisions”.

Appraisals of Demands and Resources. To measure appraisals, we used the Challenge and Hindrance Appraisals scale (Li et al., 2020; 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 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-items sets tapping challenge appraisal (e.g.,

"… will make the experience educational") and hindrance appraisal (e.g., "… will restrict my capabilities") (1 = *strongly disagree* and 7 = *strongly agree*). Similar vignettes were developed for the three other resources (i.e. supervisor/colleague support, and autonomy) and three demands (i.e. time urgency, role conflict, and emotional demands).

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). *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) with two dimensions (exhaustion and cynicism). Sample items are "I feel used up at the end of a workday" (emotional exhaustion) and "I doubt the significance of my work" (cynicism) (0 = *never* and 6 = *every day*).

Analytical Strategy

We conducted three sets of analyses. First, a preliminary set of confirmatory factor analyses (CFA) was conducted to test the measurement model for the study variables. To assess model fit, we used the RMSEA and the SRMR (with values of .08 indicating acceptable fit, Hu & Bentler, 1999), the comparative fit index (CFI) and the Tucker-Lewis index (TLI) (with values over .90 being considered acceptable, Hoyle, 1995). Second, based on these findings, we focused on the participants' appraisal of the seven included job characteristics. For each job characteristic we examined the correlation between the challenge and hindrance appraisal ratings. Moreover, for each pair of challenge-hindrance ratings, we conducted a paired *T*-test to see whether the means of these ratings differed significantly. The third set of analyses to test the hypotheses by examining the relationships among the variables using regression analyses. Specifically, for each job characteristic a separate hierarchical multiple regression analysis was estimated using SPSS, with burnout and engagement as the criterion variables. Because we did not expect one interaction term of job characteristic with appraisal accounts

for additional variances beyond the other interaction terms, we utilized a piecemeal approach and tested the moderation effects in separate models. Moreover, including all main effects and interaction effects in a single regression model would lower the subjects to effects-ratio, resulting in lower statistical power, overfitting of the model and – hence – low replicability of the findings (Austin & Steyerberg, 2015). To avoid such unnecessary complications, we therefore conducted separate regression analyses for each job characteristic. Specifically, we entered work time and level of education as control variables in Step 1 as these two variables are related to appraisals (see Table 2). The predictor variables (job demands/resources, challenge and hindrance appraisals) were entered in Step 2. In Step 3, the potential interactions (of job demands/resources and challenge/hindrance appraisal) were entered. To ease interpretation, we used centered variables when computing the interaction terms (Hayes, 2013).

Study 1 Results

Measurement Model

We first conducted a CFA to test the measurement model for the study variables. In the first model, all items loaded on their corresponding hypothesized latent constructs. This 23-factor model (i.e., 3 demands, 4 resources, 14 challenge/hindrance appraisals of demands and resources, and 2 outcomes, see Table 1) provided favorable fit statistics ($\chi^2_{(3232)} = 5{,}459.85$, $p < .001$; RMSEA = .04; CFI = .92; TLI = .91; SRMR = .04). Then we compared this hypothesized model to five alternative measurement models. The results presented in Table 1 demonstrated that the 23-factor model fitted the data best.

~~~~~~~~~~~~~~~Insert Table 1 about here~~~~~~~~~~~~~~~

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 the challenge-hindrance ratings of
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each of the three demands correlated negatively, with the correlations ranging from -.43, $p < .001$, for time urgency demands to -.51, $p < .001$, for emotional demands. Similarly, the challenge and hindrance appraisals of each of the four resources were negatively related, with correlations ranging from -.33, $p < .001$, for feedback to -.48, $p < .001$, for autonomy. Negative correlations between the challenge and hindrance appraisals of a particular demand or resource indicate that the more employees appraised a demand or resource as challenging, the lower the likelihood that they will appraise that demand or resource as hindering. In addition, since the correlations ranged between -.33 and -.51, a substantial part of the variance (i.e., at least 74%) in the challenge (hindrance) rating of the demands/resources is not accounted for by its challenge (hindrance) rating.

~~~~~~~~~~~~~~~Insert Table 2 about here~~~~~~~~~~~~~~~

In addition, regarding the appraisal of job demands, the means in Table 2 show 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 ($M_{challenge} = 4.10$, $SD = 1.41$; $M_{hindrance} = 4.33$, $SD = 1.42$; $T = -2.17$, $p = .03$) and emotional demands ($M_{challenge} = 3.80$, $SD = 1.54$; $M_{hindrance} = 4.55$, $SD = 1.48$; $T = -6.53$, $p < .001$) were more frequently 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 ($M_{challenge} = 5.35$, $SD = 0.95$; $M_{hindrance} = 3.23$, $SD = 1.42$; $T = 23.58$, $p < .001$), feedback from others ($M_{challenge} = 5.38$, $SD = 0.95$; $M_{hindrance} = 3.11$, $SD = 1.44$; $T = 26.2$, $p < .001$), and colleague support ($M_{challenge} = 5.26$, $SD = 0.98$; $M_{hindrance} = 3.24$, $SD = 1.49$; $T = 22.22$, $p < .001$). Finally, 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
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employees are significantly different in their appraisals of these job characteristics (see Table 2).

Hypotheses Testing

Appraisals of Job Demands and Well-being. We hypothesized that job demands will be positively associated with burnout and negatively associated with engagement (Hypothesis 1). Table 3, Step 2, shows that burnout was positively related to time urgency (β = .42, p < .001), role conflict (β = .45, p < .001), and emotional demands (β = .59, p < .001). In contrast, engagement was negatively associated with time urgency (β = -.20, p < .001), role conflict (β = -.23, p < .001), and emotional demands (β = -.32, p < .001), which supported Hypothesis 1.

~~~~~~~~~~~~~~~Insert Table 3 about here~~~~~~~~~~~~~~~

In Table 3, Step 3, we tested the moderating effects of appraisals on the relationship between various job demands and work engagement/burnout (Hypotheses 2-5), controlling for work time and education. The interactions between challenge appraisals on the one hand and time urgency (β = .10, p = .03), role conflict (β = .13, p = .01), and emotional demands (β = .11, p = .03) on the other, predict work engagement. Follow-up simple slope 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, t = -1.74, p = .08; role conflict, b = -.09, t = 1.83, p = .07; emotional demands, b = - .33, t = -3.80, p < .001) than when these appraisals were low (time urgency, b = -.25, t = -4.97, p < .001; role conflict, b = -.26, t = -5.79, p < .001; emotional demands, b = -.63, t = -7.23, p < .001). We plotted the simple slope analysis for time urgency in Figure 1 (the plots for role conflict and emotional demands analyses are available upon request from the corresponding author; the patterns are similar to those in Figure 1). Hence, Hypothesis 2 was supported.

~~~~~~~~~~~~~~~Insert Figure 1 about here~~~~~~~~~~~~~~~

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 of hindrance appraisal and job demands on engagement were not significant (Hypothesis 4 not supported). Interestingly, while the interaction of hindrance appraisal and role conflict failed to predict burnout (β = -.05, p = .27), the interactions of hindrance appraisal on the one hand and time urgency (β = .10, p = .03) and emotional demands (β = .12, p = .01) on the other did predict 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, t = 8.44, p < .001; emotional demands, b = 1.08, t = .71, p < .001) than when hindrance appraisal was low (time urgency, b = .29, t = 5.97, p < .001; emotional demands, b = .73, t = 8.84, p < .001) (cf. Figure 2. For brevity we only present the plot for emotional demands, the plot of time urgency is similar to Figure 2 and can be obtained on request from the first author) (Hypothesis 5 partially supported).

~~~~~~~~~~~~~~~Insert Figure 2 about here~~~~~~~~~~~~~~~

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 (β = .34, p < .001), supervisor support (β = .42, p < .001), colleague support (β = .33, p < .001), and feedback from others (β =.31, p < .001). Burnout was negatively associated with autonomy (β = -.36, p < .001), supervisor support (β = -.41, p < .001), colleague support (β = -.30, p < .001), and feedback from others (β = -.28, p < .001). These results supported Hypothesis 6.

~~~~~~~~~~~~~~~Insert Table 4 about here~~~~~~~~~~~~~~~

In Table 4, Step 3, we tested the moderating effects of appraisals on the relationship between job resources and work engagement/burnout (Hypotheses 7-10), after controlling education and work time. 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 on the one hand and autonomy (β = - .10, p = .06), supervisor support (β = - .15, p < .001), colleague support (β = - .12, p = .01), and feedback from others (β = - .11, p = .01) on the other did predict work engagement. Follow-up simple slope tests showed that when hindrance appraisal was high (autonomy, b = .16, t = 2.85, p = .005; supervisor support, b = .41, t = 4.63, p < .001; colleague support, b = .31, t = 2.99, p = .003; feedback from others, b = .26, t = 2.82, p = .005), the positive relations between engagement and these resources were weaker than when hindrance appraisal was low (autonomy, b = .31, t = 6.97, p < .001; supervisor support, b = .84, t = 9.73, p < .001; colleague support, b = .70, t = 7.71, p < .001; feedback from others, b = .58, t = 7.34, p < .001). Thus, Hypothesis 9 was supported (see Figure 3. We only plotted the simple slope analyses results for supervisor support; the other moderation patterns are similar to Figure 3).

~~~~~~~~~~~~~~~Insert Figure 3 about here~~~~~~~~~~~~~~~

Lastly, the interactions of hindrance appraisals on the one hand and autonomy (β = .12, p = .04), supervisor support (β = .15, p < .001), colleague support (β = .15, p < .001), and feedback from others (β = .16, p < .001) on the other 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, t = - 2.78, p = .01; supervisor support, b = -.35, t = -3.74, p < .001; colleague support, b = -.22, t = -2.0, p = .046; feedback from others, b = -.14, t = -1.44, p = .15) than when hindrance appraisal was low (autonomy, b = -.34, t = - 7.16, p < .001; supervisor support, b = -.81, t = -8.79, p < .001; colleague support, b = -.72, t = -7.58, p < .001; feedback from others, b = -.60, t = -7.14, p < .001) (see Figure 3; Hypothesis 10 supported).
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Study 1: Summary. 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 (12 out of 28 possible interactions). Specifically, when challenge appraisal was high, both the negative relationship between job demands and employee well-being and the positive relationship between job resources and employee well-being became weaker.

The study provided preliminary support for our hypotheses. However, there are several limitations to Study 1. First, we measured employees' appraisal in vignettes, 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 than for nurses (Bakker & Sanz-Vergel, 2013). Third, we collected data using an online data pool. 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).

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 increase the generalizability of our findings since this is a homogenous rather than a heterogeneous sample from multiple organizations. Moreover, this follow-up study used a

different approach for measuring appraisals (i.e., referring to employees' current job characteristics instead of referring to a vignette). 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. The data were collected in compliance with the American Psychological Association's ethical regulations regarding the treatment of human participants. Informed consent was obtained via clicking an agreement button, and participants were ensured of anonymity and voluntary nature of their participation. As a thank you gift, 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. An example of challenge appraisal is "… will help me to learn a lot"; an example of hindrance appraisal is "… will hinder any achievement I might have".

Study 2 Results

Measurement Model

Again, we conducted CFA to examine the discriminant validity of the variables. 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 fitted the data better than five alternative models (see Table 5). Overall, these results support the distinctiveness of three demands, four resources, seven appraisals, burnout, and engagement.

~~~~~~~~~~~~~Insert Table 5 about here~~~~~~~~~~~~~

Challenge and Hindrance Ratings of Job Characteristics

Table 6 presents the means, standard deviations, reliabilities, and correlations. 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 ($M_{challenge} = 4.57$, $SD = 1.27$; $M_{hindrance} = 4.11$, $SD = 1.35$; $T = 3.50$, $p < .001$) and emotional demands ($M_{challenge} = 4.63$, $SD = 1.30$; $M_{hindrance} = 3.91$, $SD = 1.40$; $T = 5.47$, $p < .001$) were more likely to be perceived as challenges than as hindrances. As for job resources, the results in Table 6 show that autonomy was considered more as 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 ($M_{challenge} = 5.43$, $SD = 0.90$; $M_{hindrance} = 2.85$, $SD = 1.21$; $T = 25.72$, $p < .001$), feedback from others ($M_{challenge} = 5.46$, $SD = 0.83$; $M_{hindrance} = 2.80$, $SD = 1.17$; $T = 27.76$, $p < .001$), and colleague support ($M_{challenge} = 5.37$, $SD = 0.86$; $M_{hindrance} = 2.88$, $SD = 1.19$; $T = 27.11$, $p < .001$). This demonstrates that employees substantially differ 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).

~~~~~~~~~~~~~Insert Table 6 about here~~~~~~~~~~~~~

Hypotheses Testing

In line with Study 1, we conducted a series of hierarchical linear regression analyses to test our hypotheses. Step 1 entered work time and educational level as control variables; Step 2

entered job characteristics and its appraisals; the interactions between job characteristics and appraisals were entered in Step 3.

Hypothesis 1 postulated that job demands will be positively associated with burnout and negatively associated with engagement. Table 7, Step 2, shows that burnout was positively related to time urgency (β = .35, $p < .001$), role conflict (β = .43, $p < .001$), and emotional demands (β = .56, $p < .001$). In contrast, engagement was negatively associated with time urgency (β = -.13, $p = .007$), role conflict (β = -.24, $p < .001$), and emotional demands (β = -.38, $p < .001$), which supported Hypothesis 1 and replicates the findings of Study 1.

In Table 7, Step 3, 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 on the one hand and time urgency (β = -.13, $p = .037$), role conflict (β = -.102, $p = .083$), and emotional demands (β = -.12, $p = .014$) on the other predict burnout. We plotted the simple slopes for time urgency in Figure 4. 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, with the exception of challenge appraisal and emotional demands on work engagement, which showed a marginally significant interaction (β = .098, $p = .074$). Hence, Hypotheses 2, 4, and 5 were not supported.

~~~~~~~~~~~~~Insert Table 7 about here~~~~~~~~~~~~~

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

In Table 8, Step 3, we tested the moderating effects of appraisals on the relationship between various job resources and work engagement/burnout (Hypotheses 7-10). The results showed that the interactions between challenge appraisal on the one hand, and autonomy (β = .13, p = .028), supervisor support (β = .15, p = .005), colleague support (β = .11, p = .021), and feedback (β = .19, p = .003) on the other predict employee engagement. Specifically, the positive relationship between these job characteristics and work engagement was more positive when challenge appraisal was high (see Figure 5), which supported Hypothesis 7. The interactions between challenge appraisal and job resources on burnout were not significant. Therefore, Hypothesis 8 was not supported. Unexpectedly, no significant moderation effects of *hindrance* appraisals and job resources on burnout and engagement were found (Hypotheses 9-10 not supported).

Summary of Study 2. In study 2, we used a homogeneous sample and asked employees to categorize their job characteristics as challenges, hindrances, or both. 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. Specifically, we found that challenge appraisal moderated the relationship between job demands (emotional demands and time urgency) and employee burnout, such that the positive relationship was weaker. Further, the beneficial effect of selected resources (autonomy, colleague support, supervisor support, and feedback) on employee engagement and burnout (only for feedback) was stronger when nurses considered these job characteristics as challenging. The moderation hypotheses were tested across two studies with different samples and study designs (i.e., measurement of appraisals), and the

significant relationships across two studies are generally in line with the directions of the links predicted in our hypotheses.

However, note that in Study 2 we did not fully replicate the results of Study 1. In Study 1 we only found significant interactions between job resources and hindrance appraisal on employee well-being (7 out of 8 valid interactions), whereas in Study 2 we only found significant interactions between job resources and challenge appraisals on employee well-being (5 out of 8 valid interactions) (for a comparison of these two studies, see Table 9). However, 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 due to different measurements. As aforementioned, in Study 2 we asked employees to appraise their *current* job characteristics, whereas in Study 1 measured employees' *general* appraisals. Although Study 2 did not fully replicate the results of Study 1, we believe this study enhanced the internal validity of our measurement of appraisals.

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. Further, the more the employee perceives a certain job resource to be challenging, the stronger the relationship between this resource and employee engagement. 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.

These findings are in line with the results reported by Li et al. (2020), who found that the adverse effects of job demands on well-being are weaker if these demands are appraised as challenges (vs. non-challenges). Specifically, 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, as shown in the present study. Our study thus contributes to the literature by suggesting that employees will benefit from appraising job demands as high-challenge, and the beneficial effect of job resources on employee well-being will be weaker for employees viewing these resources as high-hindrance.

However, the results did not reveal any significant interaction effects between hindrance appraisal and job demands on engagement in two studies. This may be due to a

ceiling effect, in that employees experiencing high demands are already likely to experience relatively low levels of engagement, and perceiving these demands as hindering is not likely to result in even lower levels of engagement (Koopmann et al., 2018). This finding is also in line with Cavanaugh et al. (1998) that at the highest levels of challenge stressors, these stressors will become overwhelming. As such, hindrance appraisal will not exacerbate the negative effect of the stressors on well-being.

Further, we found that hindrance appraisals significantly moderate the relationship between selected job resources and work engagement and burnout (in Study 1). Whereas in Study 2, we found that challenge appraisals moderate the relationship between selected job resources and work engagement. Although these findings were not completely consistent across the two studies, they are all aligned with our hypotheses.

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 (for a critical review of the Challenge-Hindrance Stressor Framework, see 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). Instead of using such an a priori categorization method, 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 characteristic 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 for role conflict and emotional demands in Study 2); however, it demonstrated a negative effect on work engagement. It is possible that whether job demands have positive or negative effects may work through different appraisal mechanisms. For instance, Mitchell et al. (2019) found when employees appraised performance pressure as a challenge, which could elicit employee engagement and positively related to task proficiency and citizenship behavior, whereas threat appraisal of performance pressure promotes incivility behavior. Similarly, Sessions et al. (2019) found the negative indirect effects of group promotive voice on leader's emotional exhaustion via challenge appraisal of group voice, and positive indirect effects through hindrance appraisal. In the current research, we argue that when job demands unfold their challenging potential on

employee well-being may depend on some boundary conditions. Kronenwett and Rigotti (2019) 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) investigated two strategies (i.e., working faster and working longer) that moderate the relationship between time pressure and work engagement, and 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 challenge or hindrance effect 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 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 vignettes 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 to 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 with regards to 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. 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 showed 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, in order 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 adopt 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 demonstrated that they may 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, incongruent appraisals of job demands and job resources appear to be more relevant for well-being, e.g. when employees see job demands as a challenge (i.e., seeing something bad as good) or when they consider job resources as a hindrance (i.e., seeing something good as bad). This knowledge is important in understanding how job characteristics influence employees and in guiding effective stress management efforts.

Data Availability Statement

The data that support the finding of this study are available upon reasonable request from the corresponding author.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Table 1. Results of confirmatory factor analyses in Study 1.

Model	Description	Chi-Square	*df*	RMSEA	CFI	TLI	SRMR
Model 1	All items loaded on their corresponding latent construct (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)	5,459.85	3,232	.04	.92	.91	.04
Model 2	Similar to Model 1, with 9 items of engagement loading on one, and 9 items of burnout loading on another latent factor	7,616.54	4,402	.04	.90	.89	.04
Model 3	Model 2, with engagement taken as three variables (i.e., vigor, dedication, and absorption), and burnout as two variables (exhaustion and cynicism)	7,463.87	4,330	.04	.90	.89	.04
Model 4	Model 1, combining seven challenge appraisals into one, and seven hindrance appraisals	15,065.95	3,430	.08	.58	.56	.13
Model 5	Model 4, splitting challenge/hindrance appraisals as two, demand and resources challenge/hindrance appraisals	9,675.82	3,407	.06	.77	.76	.06
Model 6	Model 5, combining three demands into one factor, and four resources into another factor	10,741.25	3,457	.06	.73	.06	.07

Table 2. Means, standard deviations, and correlations among the study variables in Study 1.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Education	(-)														
2. Work time (week)	-.05	(-)													
3. Time urgency	.14	.12	(.86)												
4. Role conflict	.06	.00	.53	(.84)											
5. Emotional demand	.02	.05	.49	.51	(.76)										
6. Autonomy	.08	-.13	-.21	-.21	-.25	(.81)									
7. Supervisor support	.05	-.13	-.19	-.24	-.29	.41	(.72)								
8. Colleague support	.02	-.06	-.17	-.16	-.18	.20	.52	(.65)							
9. Feedback	.05	.00	-.07	-.16	-.17	.17	.51	.48	(.65)						
10. Time urgency CA	.08	-.15	.15	.13	.00	.17	.03	.02	.03	(.87)					
11. Time urgency HA	.07	-.02	.13	.10	.26	-.03	.06	.03	.00	-.43	(.87)				
12. Role conflict CA	.05	-.14	.15	.19	.02	.19	.08	.03	.05	.60	-.23	(.85)			
13. Role conflict HA	.07	.04	.13	.06	.22	-.10	-.09	-.02	-.09	-.25	.53	-.46	(.88)		
14. Emotional demand CA	.05	-.18	.11	.11	.03	.14	.03	.03	.01	.56	-.16	.62	-.22	(.91)	
15. Emotional demand HA	.06	.06	.10	.07	.15	.01	.04	.01	.03	-.22	.48	-.29	.46	-.51	(.91)
16. Autonomy CA	.09	.16	.01	-.07	-.05	.03	.18	.21	.19	.02	.05	-.06	.08	-.07	.11
17. Autonomy HA	.04	-.28	.18	.24	.25	.09	-.02	-.08	-.08	.28	.27	.34	.12	.43	.05
18. Supervisor support CA	.13	.00	.02	-.04	-.07	.12	.24	.29	.20	.10	.06	-.01	.11	-.05	.17
19. Supervisor support HA	.00	-.16	.15	.19	.24	.07	-.07	-.09	-.12	.24	.26	.28	.12	.38	.06
20. Colleague support CA	.08	.00	.07	.01	.00	.07	.16	.23	.21	.14	.05	.04	.10	-.02	.21
21. Colleague support HA	.00	-.17	.17	.18	.25	.04	-.07	-.11	-.08	.21	.31	.31	.12	.40	.06
22. Feedback CA	.13	.07	.01	-.08	-.07	.14	.23	.24	.25	.14	.02	.04	.04	-.04	.19
23. Feedback HA	.02	-.19	.18	.25	.25	.07	-.08	-.09	-.12	.22	.30	.29	.15	.39	.06
24. Burnout	-.01	.05	.42	.45	.59	-.35	-.42	-.34	-.33	-.03	.20	-.04	.23	-.03	.13
25. Engagement	.14	-.20	-.14	-.17	-.29	.39	.48	.37	.35	.25	-.04	.24	-.12	.27	-.08
M	2.89	42.69	4.40	4.07	2.90	4.68	3.29	3.44	3.54	4.42	4.17	4.10	4.33	3.80	4.55
SD	0.62	10.25	1.34	1.48	0.77	1.48	0.75	0.70	0.78	1.37	1.42	1.41	1.42	1.54	1.48

(continued)

Table 2 (continued)

Variable	16	17	18	19	20	21	22	23	24	25
16. Autonomy CA	(.77)									
17. Autonomy HA	-.48	(.91)								
18. Supervisor support CA	.56	-.32	(.76)							
19. Supervisor support HA	-.34	.72	-.46	(.89)						
20. Colleague support CA	.49	-.19	.66	-.35	(.77)					
21. Colleague support HA	-.26	.70	-.34	.76	-.37	(.91)				
22. Feedback CA	.51	-.23	.56	-.26	.57	-.25	(.77)			
23. Feedback HA	-.36	.77	-.29	.72	-.24	.72	-.33	(.91)		
24. Burnout	-.17	.19	-.20	.23	-.18	.24	-.23	.24	(.92)	
25. Engagement	.13	.17	.21	.08	.20	.06	.25	.12	-.60	(.93)
M	5.53	2.92	5.35	3.23	5.26	3.24	5.38	3.11	3.66	4.29
SD	0.91	1.45	0.95	1.42	0.98	1.49	0.95	1.44	1.19	1.16

Note: $|.114| > r \geq |.108|$, $p < .05$; $r \geq |.114|$, $p < .01$. CA = challenge appraisal; HA = hindrance appraisal.

Table 3. Regression results for the moderation of appraisals on the relationships between job demands and work engagement/Burnout in Study 1.

	Step 1		Step 2		Step 3	
Predictors	Burnout	Engagement	Burnout	Engagement	Burnout	Engagement
Work Time	.05	-.20***	-.01	-.13**	-.00	-.13**
Education	-.00	.13**	-.07	.13**	-.07	.13**
Time Urgency			.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
R^2	.00	.06	.20	.14	.23	.16
Work Time	.05	-.20***	.03	-.16***	.03	-.15***
Education	-.00	.13**	-.04	.13**	-.05	.13**
Role Conflict			.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
R^2	.002	.06	.25	.15	.25	.16
Work Time	.05	-.20***	.01	-.13	.00	-.12***
Education	.00	.13**	-.02	.11**	-.01	.11**
Emotional Demands			.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
R^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.

Table 4. Regression results for the moderation of appraisals on the relationships between job resources and work engagement/Burnout in Study 1.

	Step 1		Step 2		Step 3	
Predictors	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
R^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**
R^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**
R^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**
R^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.

Table 5. Results of confirmatory factor analyses in Study 2.

Model	Description	Chi-Square	*df*	RMSEA	CFI	TLI	SRMR
Model 1	All items loaded on their corresponding latent construct (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)	6,288.12	3,316	.05	.87	.85	.05
Model 2	Similar to Model 1, with 9 items of engagement loading on one, and 9 items of burnout loading on another latent factor	8,297.52	4,499	.05	.86	.84	.05
Model 3	Model 2, with engagement taken as three variables (i.e., vigor, dedication, and absorption), and burnout as two variables (exhaustion and cynicism)	8,134.40	4,427	.05	.86	.85	.05
Model 4	Model 1, combining seven challenge appraisals into one, and seven hindrance appraisals	12,367.98	3,514	.09	.60	.59	.12
Model 5	Model 4, splitting challenge/hindrance appraisals as two, demand and resources challenge/hindrance appraisals	9,051.57	3,491	.07	.75	.74	.07
Model 6	Model 5, combining three demands into one factor, and four resources into another factor	10,455.34	3,541	.08	.69	.68	.08

Table 6. Means, standard deviations, and correlations among the study variables in Study 2.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Education	(-)													
2. Work time (week)	.04	(-)												
3. Time urgency	.09	.02	(.91)											
4. Role conflict	.02	-.02	.49	(.86)										
5. Emotional demand	.03	.01	.54	.48	(.82)									
6. Autonomy	-.04	-.11	-.32	-.41	-.26	(.92)								
7. Colleague support	-.01	-.05	-.28	-.21	-.29	.39	(.71)							
8. Supervisor support	-.02	-.13	-.24	-.26	-.25	.44	.68	(.78)						
9. Feedback	.09	-.08	-.08	-.14	-.13	.20	.45	.53	(.79)					
1. Time urgency CA	.04	-.13	-.13	-.19	-.27	.42	.51	.50	.36	(.85)				
11. Time urgency HA	.08	.04	.40	.40	.46	-.35	-.39	-.37	-.21	-.55	(.85)			
12. Role conflict CA	-.02	-.12	.00	-.03	-.03	.30	.38	.41	.31	.62	-.28	(.89)		
13. Role conflict HA	.09	.03	.22	.24	.27	-.24	-.28	-.32	-.18	-.37	.57	-.58	(.91)	
14. Emotional demand CA	.00	-.11	-.06	-.09	-.14	.34	.43	.49	.30	.68	-.42	.72	-.47	(.90)
15. Emotional demand HA	.12	.01	.27	.27	.29	-.21	-.20	-.26	-.13	-.28	.64	-.31	.71	-.53
16. Autonomy CA	-.01	-.11	-.11	-.15	-.09	.27	.30	.26	.13	.45	-.17	.25	-.04	.30
17. Autonomy HA	.06	-.09	.30	.38	.27	-.17	-.11	-.06	-.01	-.08	.38	.09	.28	.02
18. Colleague support CA	-.03	-.05	-.15	-.14	-.18	.23	.38	.30	.19	.49	-.25	.35	-.20	.38
19. Colleague support HA	.03	-.07	.20	.22	.18	-.04	-.02	.08	.02	-.04	.31	.12	.28	.12
20. Supervisor support CA	.07	-.10	-.13	-.12	-.21	.28	.32	.35	.25	.54	-.32	.35	-.22	.36
21. Supervisor support HA	.02	-.09	.29	.25	.23	-.06	-.06	-.05	-.01	-.09	.33	.11	.25	.10
22. Feedback CA	.00	.00	-.08	-.13	-.09	.26	.30	.24	.20	.48	-.25	.37	-.17	.37
23. Feedback HA	.05	-.12	.26	.27	.20	-.11	-.11	-.02	.02	-.10	.34	.07	.26	.03
24. Burnout	.02	.02	.49	.48	.62	-.42	-.44	-.44	-.30	-.42	.53	-.24	.36	-.34
25. Engagement	.04	.00	-.27	-.27	-.43	.43	.50	.49	.38	.56	-.51	.34	-.30	.47
M	3.98	42.18	4.27	4.16	2.80	4.45	3.47	3.20	3.54	5.07	3.68	4.57	4.11	4.63
SD	.59	15.28	1.25	1.37	.94	1.40	.71	.84	.87	1.05	1.16	1.27	1.35	1.30

(continued)

Table 6 (continued)

	15	16	17	18	19	20	21	22	23	24	25
15. Emotional Demand HA	(.92)										
16. Autonomy CA	-.03	(.82)									
17. Autonomy HA	.32	-.40	(.93)								
18. Colleague Support CA	-.09	.62	-.25	(.83)							
19. Colleague Support HA	.31	-.30	.62	-.25	(.91)						
20. Supervisor support CA	-.16	.58	-.25	.72	-.27	(.86)					
21. Supervisor support HA	.30	-.27	.67	-.27	.74	-.42	(.92)				
22. Feedback CA	-.10	.61	-.26	.71	-.21	.65	-.23	(.83)			
23. Feedback HA	.28	-.35	.65	-.34	.71	-.30	.73	-.44	(.92)		
24. Burnout	.38	-.27	.29	-.36	.21	-.35	.29	-.33	.30	(.94)	
25. Engagement	-.31	.32	-.18	.41	-.09	.41	-.16	.37	-.15	-.75	(.94)
M	3.91	5.50	2.96	5.37	2.88	5.43	2.85	5.46	2.80	2.50	3.20
SD	1.40	0.83	1.25	0.86	1.19	0.90	1.21	0.83	1.17	1.15	1.12

Note: $|.151| > r \geq |.116|$, $p < .05$; $r \geq |.151|$, $p < .01$. CA = challenge appraisal; HA = hindrance appraisal.

Table 7. Regression results for the moderation of appraisals on the relationships between job demands and work engagement/burnout in Study 2.

	Step 1		Step 2		Step3	
Predictors	Burnout	Engagement	Burnout	Engagement	Burnout	Engagement
Work Time	.02	-.00	-.03	.06	-.03	.064
Education	.020	.04	-.02	.06	-.02	.06
Time Urgency			.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
R^2	.00	.00	.41	.40	.42	.40
Work Time	.02	-.00	.01	.03	.01	.03
Education	.02	.04	-.01	.06	-.00	.05
Role Conflict			.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
R^2	.00	.00	.30	.19	.31	.20
Work Time	.02	-.00	-.01	.05	-.01	.05
Education	.02	.04	-.01	.05	-.01	.04
Emotional Demands			.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
R^2	.00	.00	.46	.36	.47	.37

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

Table 8. Regression results for the moderation of appraisals on the relationships between job resources and work engagement/burnout in Study 2.

	Step 1		Step 2		Step 3	
Predictors	Burnout	Engagement	Burnout	Engagement	Burnout	Engagement
Work Time	.02	-.00	-.01	.06	-.01	.06
Education	.02	.04	-.01	.06	-.01	.06
Autonomy			-.36***	.38***	-.36***	.36***
Challenge Appraisals			-.10	.21***	-.09	.23***
Hindrance Appraisals			.19**	-.03	.19**	-.04
Autonomy× CA					.02	.13*
Autonomy × HA					-.00	.07
R^2	.00	.00	.23	.24	.23	.25
Work Time	.02	-.00	-.02	.07	-.02	.07
Education	.02	.04	.02	.03	.01	.06
Supervisor Support			-.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
R^2	.00	.00	.28	.31	.28	.33
Work Time	.02	-.00	.00	.03	-.01	.04
Education	.02	.04	.01	.05	.00	.06
Colleague Support			-.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
R^2	.00	.00	.26	.31	.26	.32
Work Time	.02	-.00	.02	.02	.01	.03
Education	.02	.04	.03	.02	.01	.03
Feedback			-.27***	.32***	-.26***	.31***
Challenge Appraisals			-.17**	.30***	-.13*	.26***
Hindrance Appraisals			.23***	-.03	.25***	-.06
Feedback × CA					-.22***	.19**
Feedback × HA					-.04	.09
R^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.

Table 9. A comparison of the interaction effect between job characteristics and appraisals among three studies.

Hypotheses	Hypothesized Relationships	Study 1	Study 2
Main 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
Main 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 weaker 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.

Figure 1. The interaction between time urgency and challenge appraisal on engagement in Study 1.

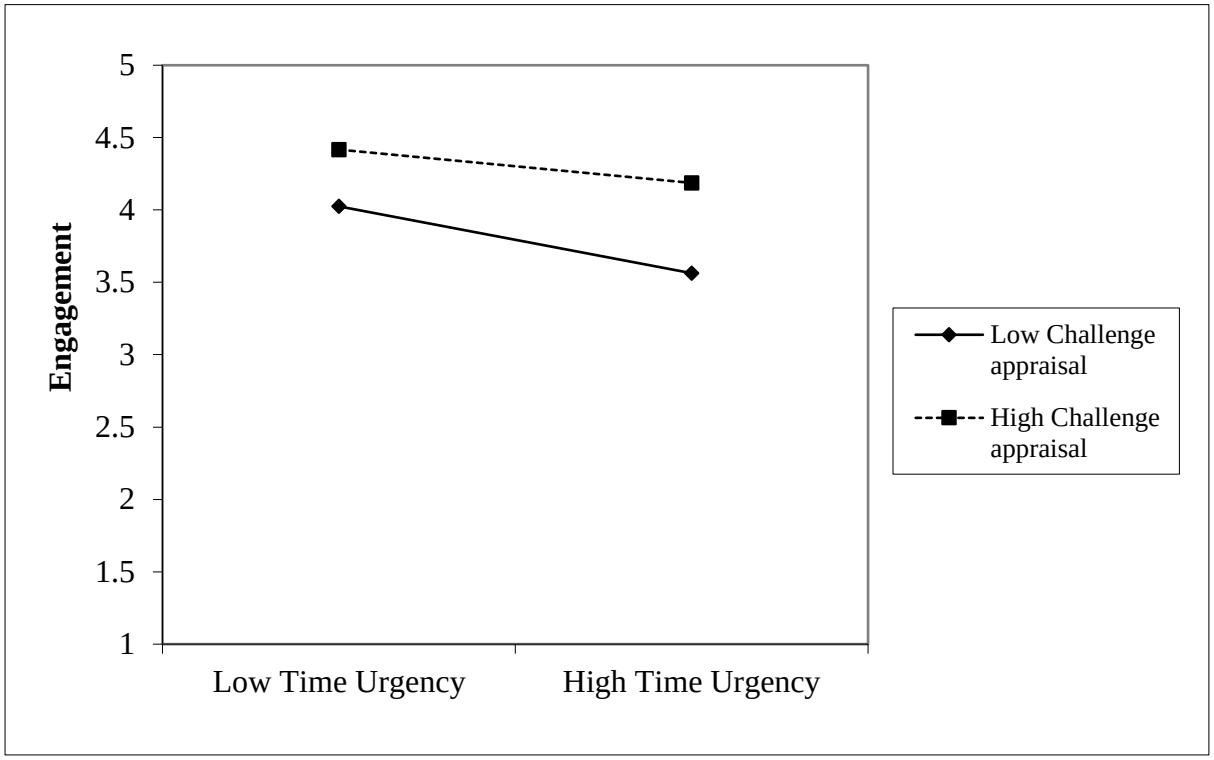


Figure 2. The interaction between emotional demands and hindrance appraisal on burnout in Study 1.

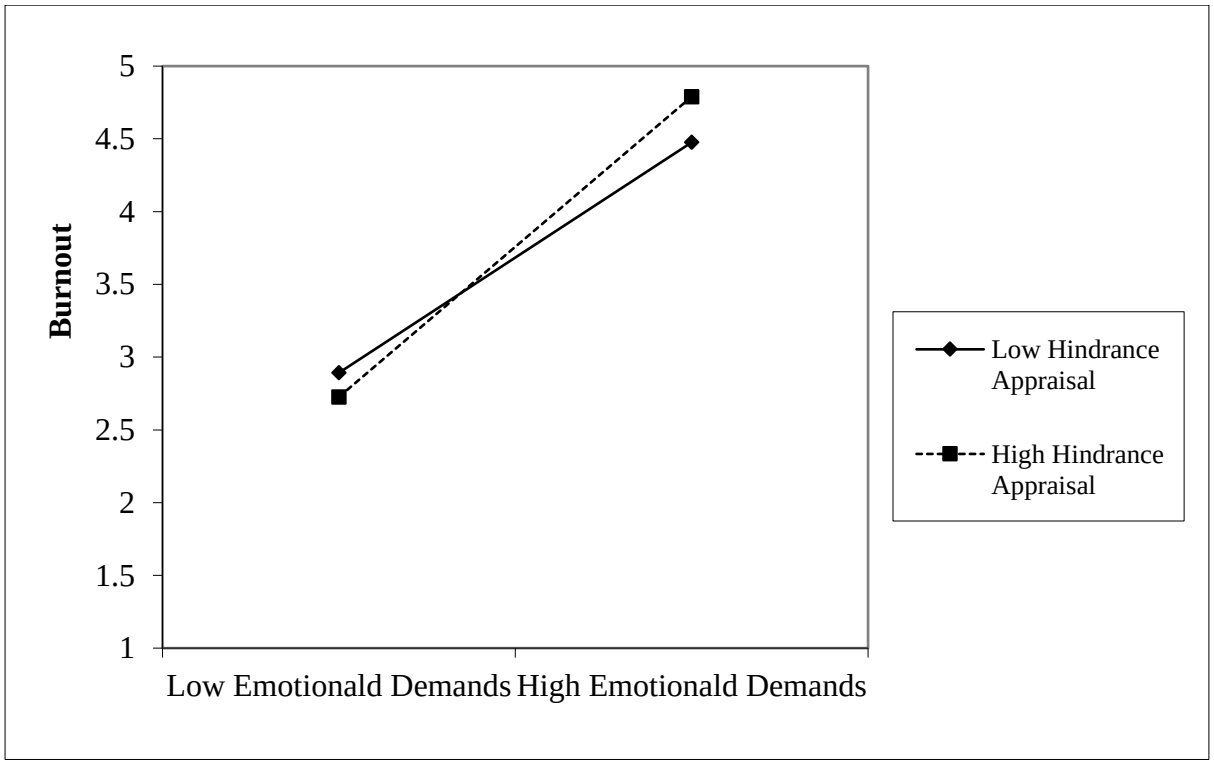
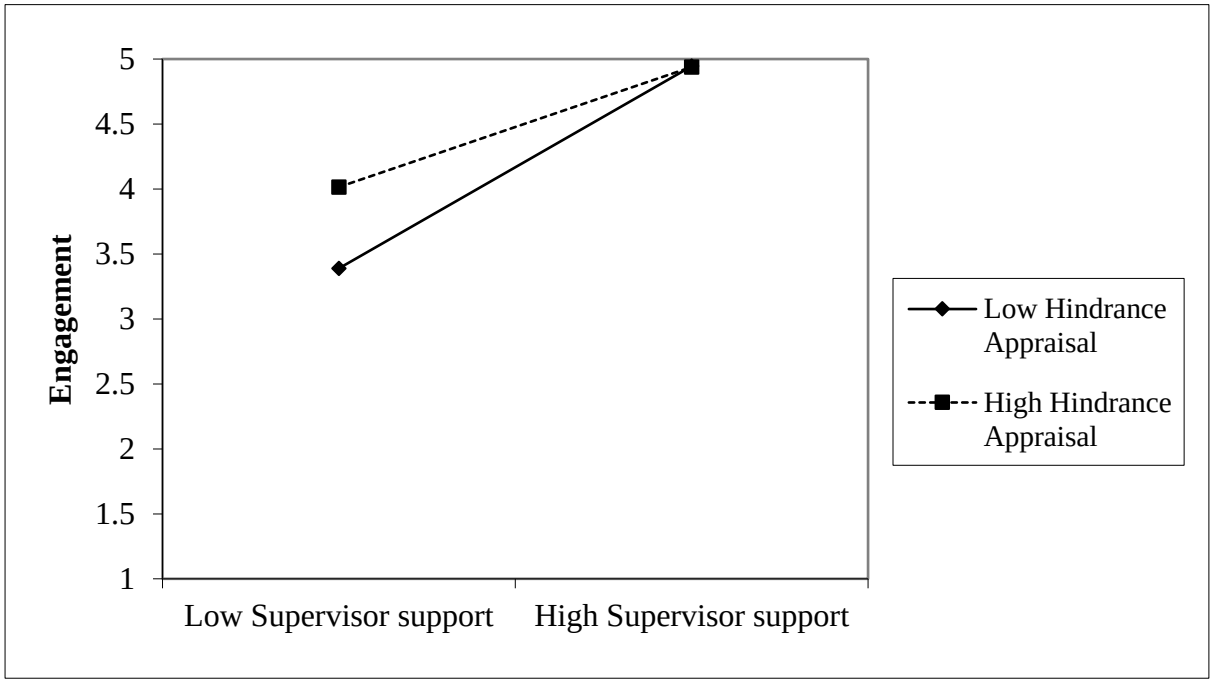


Figure 3. The interactions between supervisor support and hindrance appraisal on engagement (top) and burnout (bottom) in Study 1.



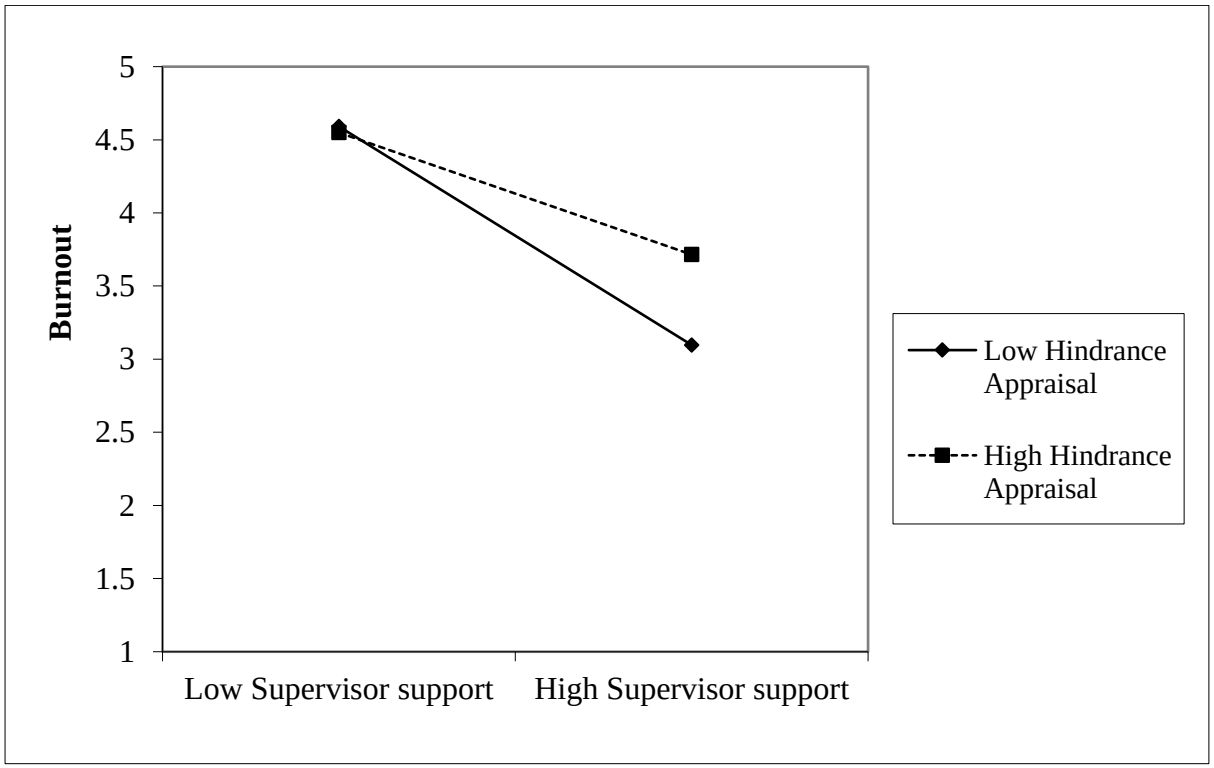


Figure 4. The interaction between time urgency and challenge appraisal on burnout in Study 2.

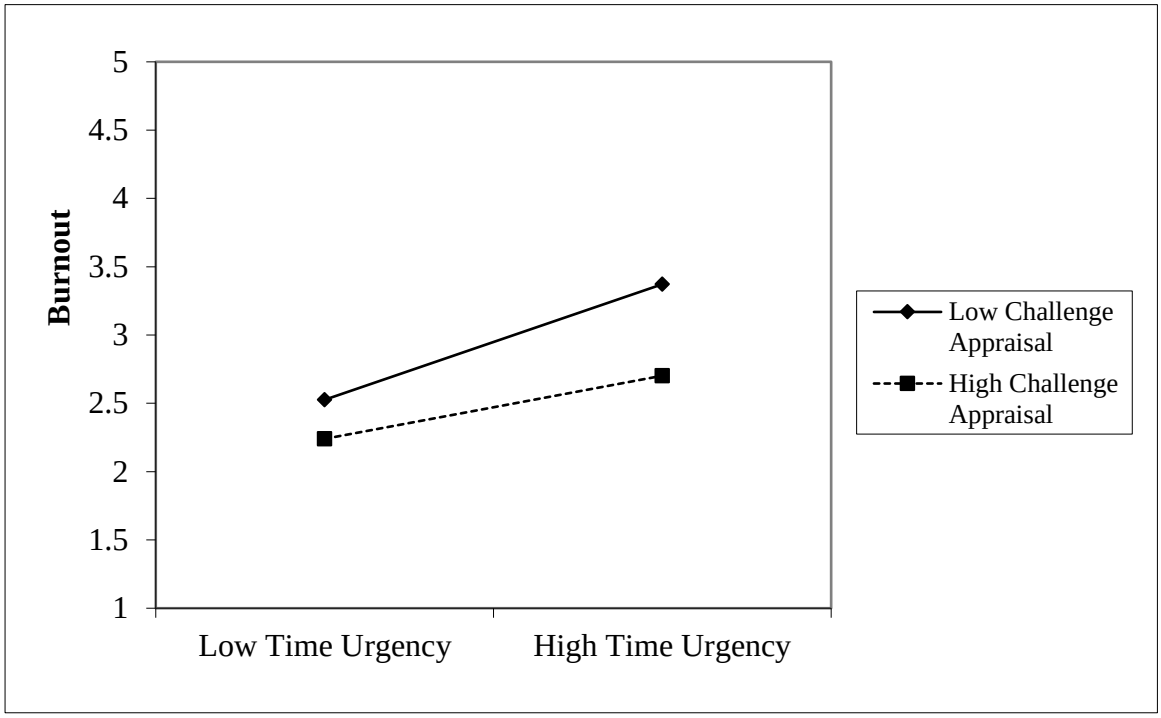


Figure 5. The interactions between feedback and challenge appraisal on engagement (top) and burnout (bottom) in Study 2.