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Not all job demands are equal: Differentiating job hindrances and job challenges in the Job Demands-Resources model

Anja Van den Broeck [a]; Nele De Cuyper [a]; Hans De Witte [a];Maarten Vansteenkiste [b]
[a] Department of Psychology, Katholieke Universiteit Leuven, Belgium [b] Department of Developmental, Personality and Social Psychology, Ghent University, Belgium

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Anja Van den Broeck, Nele De Cuyper and Hans De Witte
Department of Psychology, Katholieke Universiteit Leuven, Belgium

Maarten Vansteenkiste
Department of Developmental, Personality and Social Psychology, Ghent University, Belgium

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This study aimed to integrate the differentiation between two types of job demands, as made in previous studies, in the Job–Demands Resources (JD-R) model. Specifically, this study aimed to examine empirically whether the differentiation between job hindrances and job challenges, next to the category of job resources, accounts for the unexpected positive relationships between particular types of job demands (e.g., workload) and employees' work engagement. Results of confirmatory factor analyses supported the differentiation between the three categories of job characteristics in two samples ($N_1 = 261$ and $N_2 = 441$). Further, structural equation modelling confirmed the hypotheses that job hindrances associate positively with exhaustion (i.e., the main component of burnout) and negatively with vigour (i.e., the main component of work engagement). Job resources displayed the reversed pattern of relations. Job challenges were positively related to vigour. Rather unexpectedly, they were unrelated to exhaustion. Based on these findings, we discuss the importance of the differentiation between different types of job demands in the JD-R model for both theory and practice.

Keywords: Burnout; Engagement; Job Demands–Resources model; Job challenges; Job hindrances.

Correspondence should be addressed to Anja van den Broeck, Tiensestraat, 102 (Box 03716), B-3000 Leuven, Belgium. E-mail: anja.vandenbroeck@psy.kuleuven.be

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The Job Demands–Resources model (JD-R model; Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) is a comprehensive job characteristics model. It aims to account for both employees' ill-health (i.e., burnout) and well-being (i.e., engagement). It categorizes the health-impairing aspects in the work context (e.g., workload, emotional demands) as job demands and the stimulating job characteristics (e.g., task autonomy, positive feedback) as job resources. Some JD-R studies have, however, shown that particular job demands (i.e., workload, cognitive demands) are positively associated with positive outcomes such as engagement, both concurrently (e.g., Bakker, Demerouti, & Schaufeli, 2005b) and over time (Mauno, Kinnunen, & Ruokolainen, 2007).

This study aims to provide and test an explanation for these unexpected results. In line with previous studies (e.g., Podsakoff, LePine, & LePine, 2007), we argue that the category of job demands is not as homogeneous as initially proposed in the JD-R model. In particular, we maintain that two qualitatively different subcategories may be grouped under the heading of job demands (e.g., Podsakoff et al., 2007); namely, health-impairing job demands that hinder optimal functioning (i.e., job hindrances) and job demands that require some energy, but are nonetheless stimulating (i.e., job challenges). These two different types of job demands are assumed to yield different relationships with exhaustion and vigour, which represent the core components of burnout and engagement, respectively (González-Romá, Schaufeli, Bakker, & Lloret, 2006; Maslach, Schaufeli, & Leiter, 2001) and may be considered as complementary aspects of employees' well-being. Before elaborating upon the conceptual differentiation between job hindrances and job challenges, we first summarize the basic concepts and principles of the JD-R model.

JOB DEMANDS AND JOB RESOURCES

The JD-R model (Bakker & Demerouti, 2007; Demerouti et al., 2001) has recently been developed to integrate and elaborate upon previously developed job characteristics models such as the Demand Control Model (Karasek, 1979) and the Effort Reward Imbalance model (Siegrist, 1996). First, whereas most other job characteristics models emphasize health-impairing job characteristics and ill-health, the JD-R model also pays attention to stimulating job characteristics and well-being. This aligns with the growing interest in individuals' optimal functioning and positive experiences at work (Luthans, 2002; Seligman & Csikszentmihalyi, 2000). Second, most previous models consider a rather limited set of job characteristics. Much in line with Warr's Vitamin model (Warr, 1987), the JD-R model considers a broad variety of job characteristics in relation to employees' well-being (Bakker, Demerouti, Taris, Schaufeli, & Schreurs,

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2003c). According to the JD-R model, the variety of job characteristics can be meaningfully grouped in two broad categories: job demands and job resources.

Job resources refer to the physical, psychological, social, or organizational aspects of the work context that (1) can reduce job demands and their health-impairing impact, (2) are functional in achieving work goals, and/or (3) stimulate personal development and learning (Bakker & Demerouti, 2007). The category of job resources contains work aspects as diverse as opportunities for skill utilization, supervisor support, financial rewards, and career opportunities (Bakker & Demerouti, 2007). Several studies in different professions and sectors have shown that job resources relate positively to vigour and dedication (i.e., engagement; Bakker et al., 2005b; Salanova, Agut, & Peiro, 2005) and negatively to exhaustion and cynicism (i.e., burnout; Bakker, Demerouti, & Verbeke, 2004; Hakanen, Bakker, & Schaufeli, 2006). Moreover, job resources have been found to promote the development of engagement over time (Hakanen, Schaufeli, & Ahola, 2008; Mauno et al., 2007).

Job demands refer to the aspects of the work context that overburden employees' personal capacities. They are associated with physiological and/or psychological costs, such as exhaustion and cynicism (i.e., burnout; Bakker & Demerouti, 2007; de Jonge & Dormann, 2006). Like job resources, the category of job demands comprises a variety of job characteristics, including task interruptions, workload, role ambiguity, and work–home interference (Bakker & Demerouti, 2007). JD-R scholars assume that employees who are confronted with job demands will initially try to withstand them, for instance by putting more energy in their jobs (Schaufeli & Bakker, 2004). Prolonged exposure to and coping with job demands, however, increasingly wears out employees' personal energy, engendering feelings of exhaustion. In an attempt to protect their resources and energy level, employees might subsequently lower their performance goals (e.g., by decreasing their work tempo, by reducing their punctuality). However, such a gradual withdrawal makes employees increasingly vulnerable for the adoption of a cynical attitude towards their jobs (Maslach et al., 2001). In line with this theorizing, several empirical studies confirmed that various job demands are positively associated with exhaustion and cynicism (e.g., Bakker, Demerouti, de Boer, & Schaufeli, 2003a; Demerouti et al., 2001) and predict burnout in the long term (e.g., Hakanen et al., 2008).

Although not specified in the JD-R model, mostly negative relations have been found between job demands and work engagement. This aligns with the assumption that job demands are health impairing. In some studies, however, a positive relation has been reported between particular job demands and work engagement. For example, workload (i.e., the amount of

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work or the workplace) has been related positively to vigour and dedication and to elicit engagement over time (Bakker, Demerouti, & Schaufeli, 2003b, 2005b; Bakker, van Emmerik, & Euwema, 2006; Hallberg, Johanson, & Schaufeli, 2007; Mauno et al., 2007; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008). Likewise, cognitive demands (i.e., the amount of sustained mental effort a job requires) were positively related to vigour and dedication in the study by Bakker and his colleagues (2005b).

In an attempt to explain these unexpected results, JD-R scholars as well as others (e.g., Warr, 1987) have argued that the relation between workload, cognitive demands, and engagement may be inverted U-shaped (Bakker et al., 2005; Mauno et al., 2007): Whereas moderate levels of these job demands would enhance work engagement, fairly low or high levels would decrease work engagement (e.g., Bakker et al., 2005b). Such quadratic relations have, however, received only limited empirical support (for an overview, see Rydstedt, Ferrie, & Head, 2006). Therefore, Taris (2006) argued that the idea of a quadratic relation represents an ''urban myth'', which, in his view, does not deserve further testing.

Rather than ascribing the unexpected effects of different job demands to the *quantitative* degree to which employees' experience them, as is the case when quadratic relations are assumed, we suggest that a *qualitative* differentiation between different types of job demands may help to explain the positive relation between particular job demands and work engagement. Specifically, in line with previous studies (e.g., Podsakoff et al., 2007), we propose a differentiation of two types of demands, that is, job hindrances and job challenges.

JOB HINDRANCES AND JOB CHALLENGES

In the job characteristics literature, there is growing consensus that some stressing job aspects have exclusively negative effects, whereas others yield a mix of both positive and negative consequences (e.g., Lepine, Podsakoff, & Lepine, 2005; Podsakoff et al., 2007). Specifically, in line with the definition of job demands in the JD-R model, some job demands are considered to be threatening obstacles that drain employees' energy. When confronted with such job demands, employees feel a lack of control, experience negative emotions, and, as a result, tend to adopt an emotion-focused coping style (Folkman & Lazarus, 1985). Because these demands elicit negative emotions, they would interfere with employees' work goal achievement and well-being. These job demands have therefore been labelled as ''job hindrances'' and they include work characteristics such as role ambiguity, job insecurity, constraints, and interpersonal conflicts (e.g., Cavanaugh, Boswell, Roehling, & Boudreau, 2000; Lepine et al., 2005).

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In contrast, other job demands may both be energy-depleting *and* stimulating; the latter feature being generally ascribed to job resources. Although these job demands require energy, they also contain potential gains. They appeal to employees' curiosity, competence, and thoroughness. Because they elicit a problem-focused coping style, they are likely to contribute to the achievement of work goals. As such, they yield opportunities for growth and development (Cavanaugh et al., 2000; McCauley, Ruderman, Ohlott, & Morrow, 1994). These job characteristics have been labelled "job challenges" and include job characteristics such as workload, time pressure, and cognitive demands (Boswell, Olson-Buchanan, & LePine, 2004; Cavanaugh et al., 2000; Lepine et al., 2005). Job challenges both deplete employees' energy *and* stimulate them to put effort in their job, as they yield the promise of goal achievement and need satisfaction. Therefore, they may relate positively to ill-health (e.g., stress, burnout) *as well as* to well-being (e.g., motivation, job satisfaction; Lepine et al., 2005).

The differentiation between job hindrances and job challenges builds on Selye's (1956) distinction between positive and negative feelings of stress, referred to as "eustress" and "distress", respectively. Eustress and distress both activate individuals. However, unlike eustress, which involves feelings of being challenged and which may contribute to better achievement, distress disturbs individuals' balance in a negative way and prompts negative emotions. According to Selye, eustress represents a positive motivating force, which might elicit problem-focused coping, involvement, and even achievement. Distress, in contrast, is likely to result in avoidance behaviour and withdrawal from the task at hand.

In line with this conceptualization, two recent meta-analyses have provided support for the assumption that job hindrances and job challenges yield different well-being associates. In accordance with the suggestions that both job challenges and job hindrances tax employees' personal capacities, they have been found to yield a positive relation to health impairment, as indexed by emotional exhaustion, anxiety, and physical symptoms (Lepine, LePine, & Jackson, 2004; Podsakoff et al., 2007). Job challenges related, however, positively to job satisfaction, motivation, and performance, and negatively to job search and turnover, whereas job hindrances displayed the reversed pattern of relations (Lepine et al., 2005; Podsakoff et al., 2007). In sum, the stress-literature considers job hindrances as health impairing, whereas job challenges yield a more mixed pattern of correlates as they relate positively to both ill-health and well-being.

According to LePine et al. (2004), the different correlates of job hindrances and job challenges may be explained through Expectancy Value Theory (EVT; Vroom, 1964). According to EVT, when employees are confronted with job demands, they are likely to assess the effort required to deal with the demands, the probability of success, and the instrumentality of

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dealing with the demands to obtain highly valued outcomes. In this view, employees are likely to actively deal with job challenges because they believe they have a high probability to successfully cope with them and these job demands are perceived instrumental to achieve valued outcomes such as growth and work goal attainment. High workload, for example, may be conquerable by increased effort and meeting a deadline may result in the opportunity to work on new stimulating projects. In contrast, employees consider job hindrances more difficult to overcome and believe that their effort investment is less instrumental to achieve their goals. For example, in being confronted with an angry passenger, flight attendants might need to temporarily interrupt their task of serving drinks to all passengers. The soothing of the particular passenger might require some energy, which does not add directly to the primary goal of serving all passengers (Zapf, 2002).

The suggestion that job challenges might be motivating and therefore yield positive well-being associates, whereas job hindrances might be fairly negative, is also in line with Self-Determination Theory (SDT; Deci & Ryan, 2000). SDT maintains that individuals will flourish if the environment provides sufficient support for their basic psychological needs for autonomy (i.e., to experience a sense of volition and psychological freedom), competence (i.e., to feel capable), and relatedness (i.e., to care for and to be cared for by others). Whereas a challenging work environment is likely to provide opportunities to get one's basic needs satisfied, job hindrances are likely to thwart the basic needs. In line with this reasoning, workload has previously been found to relate positively to need satisfaction, whereas emotional demands yielded a negative relation (Van den Broeck et al., 2008).

Notably, the job characteristics literature mentioned earlier considers hindrances and challenges as objective characteristics of the job which have a fairly consistent meaning for all employees (Lepine et al., 2005), which is also consistent with the way JD-R scholars approach the different job characteristic categories (Bakker & Demerouti, 2007). Other scholars, however, assume that job demands can be either experienced as more or less hindering or challenging depending on employees' individual, subjective appraisal of the situation (Lazarus & Folkman, 1984). Although such subjective differences may exist, this article aligns with the job characteristics literature, focusing on objective differences among particular (types of) job characteristics for all employees.

PRESENT STUDY

The aim of the current study is to gain insight in the nature of job characteristics and their relationships with employees' well-being. In doing so, we aimed to integrate the distinction between job hindrances and job

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challenges in the JD-R model, which may help to better understand the sometimes unexpected well-being correlates of some job demands (e.g., workload). More generally, we argue that the integration of the literature on job hindrances and job challenges may further add to the comprehensivity of the JD-R model and enrich its theoretical and practical value. The consideration of job resources in conjunction with these two types of job demands may also add to the previous studies differentiating between job hindrances and job challenges, as they did not take job resources into account. It therefore remains to be investigated whether the associations of job challenges and employees' well-being hold when controlling for job resources, which have been found to yield strong well-being correlates. This seems to be an important question, as the positive correlates of job challenges previously only became prominent after controlling for their shared variance with job hindrances (Cavanaugh et al., 2000; Lepine et al., 2004).

As outlined in Table 1, based on the JD-R literature and the studies differentiating between job hindrances and job challenges reviewed previously, we suggest that job hindrances are threatening constraints, which deplete employees' energy and elicit an emotion-focused coping style. Rather than contributing to the achievement of the primary goal, job hindrances pose a second goal on employees and forestall need satisfaction. Because job hindrances represent the prototypical example of job demands as conceived within the JD-R model, they are likely to relate negatively to employees' optimal functioning in terms of well-being, favourable attitudes, and constructive behaviour. Job challenges, in contrast, are obstacles that can be overcome. They require energy, but are simultaneously stimulating. They elicit a problem-focused coping style, add to goal achievement, and are likely to provide opportunities for basic psychological need satisfaction. Job

TABLE 1
Differences between job hindrances, job challenges, and job resources

	Job hindrances	*Job challenges*	*Job resources*
Definition	Threatening constraints	Obstacles that can be overcome	Helpful job aspects
Process as ascribed in the JD-R model	Energetic	Energetic and Stimulating	Stimulating
Coping	Emotion focused	Problem focused	Functional in coping
Goal achievement	Forestall achievement of the primary goal as they pose a second goal	Add to goal achievement	Add to goal achievement
Need satisfaction	Frustrate needs	Provide opportunities for need satisfaction	Add to need satisfaction
Positively related to	Ill-health	Ill-health and well-being	Well-being

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challenges thus comprise both energy-demanding and stimulating features, and may therefore yield both a positive and negative relation with employees' optimal functioning. Finally, in line with the JD-R model, job resources are expected to be helpful, motivational job aspects that stimulate goal achievement and need satisfaction, and therefore enhance employees functioning. Based on these conceptual considerations, we expect that job hindrances, job challenges, and job resources can be differentiated from one another and that they yield unique relations with employees' well-being.

Specifically, as respects the factor structure of job characteristics, we hypothesize that a three-factor structure, including job hindrances, job challenges, and job resources, provides a better fit to the data than the one-factor structure or any other two-factor model, including the traditional JD-R model (Hypothesis 1). With respect to the intercorrelations between the three categories of job characteristics, we expect job hindrances and job challenges to correlate positively as they both belong to the category of job demands. Job hindrances are expected to relate negatively to job resources as, according to the definition of job resources, employees provided with job resources should, on average, be better able to deal with the stressful aspects of their jobs (Demerouti et al., 2001). In contrast, job challenges are expected to relate positively to job resources, as both have growth promoting features (Cavanaugh et al., 2000).

Second, we aimed to inspect the external validity of the hypothesized three-factor structure by examining their relations with employees' exhaustion and vigour. Specifically, in line with the description of the three categories of job characteristics, we expect job hindrances to relate positively to exhaustion (Hypothesis 2a) and negatively to vigour (Hypothesis 2b). Furthermore, we hypothesize job challenges to associate positively with exhaustion (Hypothesis 3a) and to relate positively to vigour (Hypothesis 3b). Finally, we examine whether these relationships hold after controlling for job resources, which are, in line with the JD-R model, hypothesized to relate negatively to exhaustion (Hypothesis 4a) and positively to vigour (Hypothesis 4b). As the tripartite model represents a more refined model, allowing for a more precise study of the relationships between job characteristics and well-being, we expect the tripartite model to explain more variance in vigour compared to the traditional JD-R model (Hypothesis 5). This is an important issue as the introduction of a more complex JD-R model only seems justified if the differentiated job characteristics categories yield a unique significant relation with employees' well-being and thereby provide a better understanding of employees' functioning compared to previous models (Van Veldhoven, Taris, de Jonge, & Broersen, 2005).

Furthermore, to rule out the possibility that our results are conditional upon one specific sample or upon measurement characteristics, we will

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validate the three-factor model in two different samples ($N_1 = 261$; $N_2 = 441$), thereby using somewhat different measures of job characteristics. We focus upon key work design variables that are present across professions and that have extensively been studied, both within the JD-R framework (e.g., Bakker, Demerouti, & Euwema, 2005a; Mauno et al., 2007) and with respect to the distinction between job challenges and job hindrances (e.g., Podsakoff et al., 2007). Specifically, we examine negative work–home interference, emotional demands, workload, cognitive demands, autonomy, and social support.

Negative work–home interference (WHI) and emotional demands have attracted researchers' interests due to the erosion of the working time standards and the shift from industry to service work in most Western societies (Parker, Wall, & Cordery, 2001). They are likely to relate to poor employees' well-being, as was established in the JD-R framework (e.g., Bakker et al., 2005a; Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007). WHI and emotional demands may be characterized by interpersonal conflicts, which previously have been labelled as job hindrances (Lepine et al., 2005). They are furthermore likely to elicit an emotion-focused coping style and prevent rather than stimulate goal achievement (Bakker & Heuven, 2006; Demerouti, Taris, & Bakker, 2007). Accordingly, in the present study, WHI and emotional demands are hypothesized to belong to the category of job hindrances. Workload and cognitive demands, in contrast, are regarded as job challenges. Both have been identified as job demands in the JD-R model, but have been labelled as a job challenge in the stress literature (e.g., Cavanaugh et al., 2000). In line with the stress literature, workload and cognitive demands have repeatedly been shown to relate positively to engagement (e.g., Mauno et al., 2007; Van den Broeck et al., 2008). Finally, autonomy and social support are hypothesized to constitute the category of job resources. They have been regarded as key resources in various job design models (e.g., Hackman & Oldham, 1976; Karasek, 1979) and have been included as a resource in almost all JD-R studies (e.g., Mauno et al., 2007).

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METHOD

Participants and procedure

In line with the recommendation by Warr (1990) to increase sample heterogeneity in examining the relationships between job characteristics and well-being, we employed two samples: The first sample included 261 Dutch call centre agents; the second sample comprised 441 police officers of the Belgian Police Department. In both samples, data collection was part of a survey on motivation and well-being requested by the management. The

response rates were 87% and 51% for Samples 1 and 2, respectively, which is comparable to response rates reported elsewhere (Baruch & Holtom, 2008). Participants of Sample 1 filled out an Internet survey during regular working hours. In Sample 2, all participants received a paper and pencil booklet which was to be returned to the collection point 1 week later. In both samples, participation was voluntary and we underlined that responses would be confidential and only available to the researchers.

Table 2 gives an overview of participants' background characteristics. In both samples gender distribution was fairly equal. Compared to Sample 2, participants in Sample 1 were younger, were somewhat less educated, and

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TABLE 2
Demographic characteristics of the participants in Sample 1 and Sample 2

	Sample 1	*Sample 2*
Profession	Call centre agents	Police officers
Country	The Netherlands	Belgium
N	261	441
Response	87%	51%
Gender		
Male	46%	57%
Female	54%	43%
Age		
Range	18–58 years	22–65 years
Mean	28.23 years	42.53 years
SD	9.00 years	9.52 years
Education		
Primary or secondary education	41%	60%
High school	54%	23%
University	5%	18%
Type of contract		
Full-time	71%	85%
Part-time	28%	15%
Type of contract		
Temporary agency	72%	0%
Fixed term	15%	0%
Permanent	14%	18%
Lifetime*	0%	82%
Tenure		
Range	1 week–7 years	< 1 year–37 years
Mean	1.24 years	6.31 years
SD	1.72 years	6.26 years

*Unlike permanent contracts that are open-ended and thus imply the possibility of dismissal, lifetime contracts are granted for life. Lifetime contracts are found among a significant proportion of civil servants in Belgium.

had less seniority. In both samples, the majority of the participants worked full-time. In Sample 1, most participants were temporary agency workers. In Sample 2, most participants had a permanent or lifetime contract.

Measurements

All questionnaires were available in Dutch, the official language used in both organizations. Unless stated otherwise, items were scored on 5-point Likert scales ranging from 1 = "strongly disagree" to 5 = "strongly agree". Scale scores were computed as the mean of the items.

Job characteristics. Concerning the job hindrances, emotional demands were assessed in Sample 1 with two items from Kristensen, Hannerz, Hogh, and Borg (2005). An example item is "My work is emotionally demanding", $r = .63$, $p < .001$. In Sample 2, two items of van Veldhoven and Meijman (1994) were used, such as: "I face emotionally charged situations in my work", $r = .59$, $p < .001$. In line with previous JD-R studies (e.g., Bakker et al., 2005a), WHI was measured with the four-item scale of Geurts and colleagues (2005) in both samples. An item example reads: "How often does it happen that your work schedule makes it difficult for you to fulfil your domestic obligations?" Responses were made on a 5-point Likert scale ranging from 1 = "never" to 5 = "very often". Cronbach's alphas were .78 and .86 in Samples 1 and 2, respectively.

With respect to the job challenges, workload was assessed with four items of van der Doef and Maes (1999) in Sample 1, such as "My work requires working very hard", $\alpha = .64$. It was measured with two items from van Veldhoven and Meijman (1994) in Sample 2, such as: "My job requires that I work very fast", $r = .54$. Cognitive demands were measured with six and four items of van Veldhoven and Meijman in Samples 1 and 2, respectively. A sample items reads "My work requires a lot of concentration", $\alpha_{\text{Sample 1}} = .81$, $\alpha_{\text{Sample 2}} = .73$.

Finally, with respect to the job resources, the autonomy scale in Sample 1 was based on van der Doef and Maes (1999). An example of this five-item scale reads: "My job allows me to make a lot of decisions on my own", $\alpha = .72$. In Sample 2, autonomy was tapped with four items from Kristensen and his colleagues (2005). An example item is: "I can decide when to take a break", $\alpha = .70$. Finally, social support was assessed with six and five items such as "I have a good relationship with my colleagues" taken from van Veldhoven and Meijman (1994) in Samples 1 and 2, respectively, $\alpha_{\text{Sample 1}} = .89$, $\alpha_{\text{Sample 2}} = .86$.

Exhaustion. This was measured with the exhaustion scale of the Dutch version of the Maslach Burnout Inventory (Schaufeli & van Dierendonck,

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2000). Exhaustion reflects a lack of energy and the feeling that one's resources are depleted. It may be considered the main component of burnout (Maslach et al., 2001). In both samples participants scored each of the five exhaustion items (e.g., "I feel totally exhausted in my job") on a 7-point frequency scale ranging from 0 = "never" to 6 = "always". Cronbach's alpha was .91 and .87 in Samples 1 and 2, respectively.

Vigour. This was assessed with the vigour scale of the Utrecht Work Engagement Scale (Schaufeli & Bakker, 2003). Vigour is considered the opposite of exhaustion (González-Romá et al., 2006). It refers to feeling well and having the energy to work hard and to work long hours. An example item is "At my work, I feel bursting with energy" (Schaufeli & Bakker, 2004). In both samples, participants indicated the frequency with which they experience vigour on a 7-point Likert scale ranging from 0 = "never" to 6 = "always". Cronbach's alpha was .91 and .88 in Samples 1 and 2, respectively.

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RESULTS

Descriptive statistics

Means and standard deviations of the scales are displayed in Table 3. A one-way ANOVA revealed that the two samples differed on all job characteristics and vigour. Specifically, compared to Sample 2 participants, Sample 1 participants experienced more emotional demands, $F(1, 693) = 63.66$, $p < .001$, and social support, $F(1, 692) = 45.11$, $p < .001$, and less WHI, $F(1, 697) = 114.48$, $p < .001$, cognitive demands, $F(1, 696) = 18.05$, $p < .001$, workload, $F(1, 696) = 5.98$, $p < .01$, and task autonomy, $F(1, 696) = 193.17$, $p < .001$. They also experienced more vigour, $F(1, 691) = 12.91$, $p < .001$. No differences were found for exhaustion, $F(1, 695) = 1.64$, *ns*.

As respects the correlations among the job characteristics, job hindrances (i.e., WHI and emotional demands), and job challenges (i.e., workload and cognitive demands) tended to relate positively. This aligned with the assumption that job hindrances and challenges are job demands. Job hindrances tended to be negatively associated with job resources (i.e., autonomy and social support). In general, relationships in Sample 2 were stronger compared to relationships in Sample 1. Across samples, job challenges and job resources were generally unrelated. As expected, job hindrances related positively to exhaustion and negatively to vigour. Job challenges were positively related to exhaustion in Sample 2, but no significant relationships were found in Sample 1. Job challenges were furthermore positively related to vigour, across samples. Finally, job resources associated positively with vigour and negatively with exhaustion.

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TABLE 3
Means, standard deviations, and correlations among measured variables in Sample 1 ($N=261$, below diagonal) and Sample 2 ($N=244$, above diagonal)

	Means		*SD*									
	Sample 1	*Sample 2*	*Sample 1*	*Sample 2*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. Work–home interference	1.23	1.90	0.90	0.74	—	.47**	.44**	.30**	−.16**	−.25**	.53**	−.17**
2. Emotional demands	3.11	2.47	0.93	1.07	.19**	—	.39**	.27**	−.18**	−.19**	.41**	−.03
3. Workload	3.16	3.22	0.60	0.93	.16**	.05	—	.53**	.00	−.04	.27**	.13**
4. Cognitive demands	3.81	4.04	0.56	0.71	.20**	.10	.42**	—	.08	.03	.20**	.20**
5. Autonomy	3.04	3.74	0.50	0.71	−.12	−.32**	.07	.09	—	.29**	−.28**	.35**
6. Social support	4.22	3.90	0.51	0.65	−.13*	−.11	.06	.17**	.28**	—	−.34**	.30**
7. Exhaustion	1.77	1.89	1.35	1.14	.54**	.15*	.04	.01	−.11	−.18**	—	−.51**
8. Vigour	3.94	3.61	1.21	1.12	−.19**	−.22**	.17**	.20***	.31**	.32**	−.41**	—

*$p < .05$, **$p < .01$, ***$p < .001$.

Analysis

The hypotheses were tested by means of structural equation modelling (SEM), using Lisrel 8.54 (Jöreskog & Sörbom, 2004) and the maximum likelihood method of estimation (Bollen, 1989). SEM provides a simultaneous test of models with multiple dependent variables, thereby statistically controlling for the relations between these variables. To correct for nonnormality of the observed data, the asymptotic covariance matrix was used and the Satorra-Bentler Scales Chi-square (SBS-χ^2; Satorra & Bentler, 1994) instead of the common χ^2 was inspected. Models were deemed to indicate good fit if the Comparative Fit Index (CFI) reached at least the .90 level (Bentler, 1990) and both the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residuals (SRMR) did not exceed .08 and .10, respectively (Byrne, 2001). Satorra-Bentler Scaled Chi-square (SBS-χ^2; Satorra & Bentler, 1994) difference tests were used for testing differences in fit.

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Structure of job characteristics (Hypothesis 1)

Before testing the structural relationships between the job characteristics categories, we first inspected the fit of the measurement model comprising the independent (i.e., job hindrances, job challenges, and job resources) and the dependent variables (i.e., exhaustion and vigour), all represented by their respective items. Specifically, as respects the structure of the job characteristics categories, the fit of the hypothesized three-factor model (Model A), including job hindrances (i.e., WHI and emotional demands), job challenges (i.e., workload and cognitive demands), and job resources (i.e., autonomy and social support) was compared with four alternative models. In each of the models, the different job characteristic scales were assigned to different higher order categories. Model B involved the traditional JD-R model differentiating between job resources and job demands, comprising both job hindrances and challenges. Model C differentiated job hindrances from a factor comprising job challenges and job resources, which are both assumed to be stimulating. Model D held challenges as a separate factor and a factor comprising both hindrances and resources, which might be considered as opposites. Finally, in Model E all job characteristics loaded on one single factor.

Table 4 reveals that the three-factor solution (Model A) fitted the data well in both samples. Moreover, the significant difference in χ^2-value (Table 4) showed that this tripartite model (Model A) yielded superior fit compared to any other two-factor model (Models B, C, and D), including the traditional JD-R model (Model B) and the one-factor model (Model E). This suggested that both types of job demands can be treated as separate

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TABLE 4
Fit indices for the various measurement models of job characteristics in Sample 1 ($N = 261$) and Sample 2 ($N = 441$)

		SBS						*ΔSBS*		
Sample	*Models*	χ^2	*df*	*p-value*	*RMSEA*	*CFI*	*SRMR*	χ^2	*df*	*p-value*
Sample 1										
	A Hindrances vs. challenges vs. resources	1494.91	619	.001	.07	.90	.08			
	B Hindrances–challenges vs. resources	2005.01	623	.001	.09	.86	.12	510.10	4	.001
	C Hindrances vs. challenges–resources	2360.32	623	.001	.10	.85	.12	865.41	4	.001
	D Hindrances–resources vs. challenges	1981.04	623	.001	.09	.86	.12	486.13	4	.001
	E Hindrances–challenges–resources	2897.57	626	.001	.12	.80	.14	1402.66	7	.001
Sample 2										
	A Hindrances vs. challenges vs. resources	1231.22	395	.001	.07	.93	.09			
	B Hindrances–challenges vs. resources	1822.37	399	.001	.09	.89	.11	591.15	4	.001
	C Hindrances vs. challenges–resources	2450.72	399	.001	.11	.86	.12	1219.50	4	.001
	D Hindrances–resources vs. challenges	3464.56	399	.001	.12	.85	.16	2233.34	4	.001
	E Hindrances–challenges–resources	3157.30	402	.001	.13	.83	.14	1926.08	7	.001

categories of job categories. All observed variables had significant loadings on their latent factor, mean $\lambda_{\text{Sample 1}} = .61$, mean $\lambda_{\text{Sample 2}} = .60$, providing further evidence for the reliability of the model. As expected, a positive correlation, $r_{\text{Sample 1}} = .29$, $r_{\text{Sample 2}} = .47$, $p < .001$, was found between job hindrances and job challenges, whereas job hindrances and job resources were negatively related, $r_{\text{Sample 1}} = -.16$, $r_{\text{Sample 2}} = -.33$, $p < .01$. The correlation between job challenges and job resources was positive in Sample 1, $r = .19$, $p < .01$, and nonsignificant in Sample 2, $r = .03$, *ns*.

Structural relations (Hypotheses 2, 3, and 4)

To test Hypotheses 2–4 concerning the relationships between the three categories of job characteristics and employees' well-being, building up Model A, a structural model was estimated: We modelled job hindrances (i.e., the items of WHI and emotional demands), job challenges (i.e., the items of workload and cognitive demands), and job resources (i.e. the items of autonomy and social support) as simultaneous predictors of exhaustion and vigour. In line with previous research (Schaufeli & Bakker, 2004), the latent constructs of exhaustion and vigour were allowed to correlate. In line with the hypotheses, results of this model (Figure 1) showed that, across samples, job hindrances related positively to exhaustion and negatively to vigour, whereas job challenges were positively related to vigour. Unexpectedly, job challenges were unrelated to exhaustion. Job resources displayed a positive relationship with vigour in both samples. The relationship between job resources and exhaustion was not significant in Sample 1, but significantly negative in Sample 2. After removing the nonsignificant

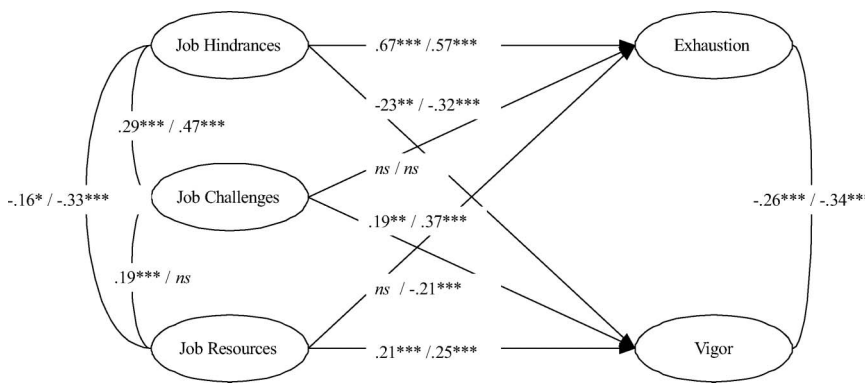

Figure 1 Structural model of the relationships between job hindrances, job challenges, job resources, exhaustion, and vigour. Coefficients represent standardized estimates. $*p < .05$, $**p < .01$, $***p < .001$.

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relationships, the model still yielded good fit to the data, SBS-$\chi^2(621) = 1504.56$, $p < .001$, CFI = .90, RSMEA = .07, SRMR = .09 in Sample 1, and SBS-$\chi^2(396) = 1231.78$, $p < .001$, CFI = .93, RSMEA = .07, SRMR = .09 in Sample 2. The three-factor model explained 45% of the variance in exhaustion in both samples and 14% and 25% of the variance in vigour in Sample 1 and Sample 2, respectively.

Comparison with the JD-R model (Hypothesis 5)

Finally, we examined the structural relations in the traditional JD-R model, based on measurement Model B, to ascertain whether the tripartite model provided more insight in employees' functioning compared to the traditional JD-R model (Hypothesis 5). As already noted, this model included the items for WHI, emotional demands, workload, and cognitive demands as indicators of job demands; the latent variables of job resources, exhaustion, and vigour were also modelled with their respective items. Results showed that, in line with the JD-R model, job demands related positively, $ß_{Sample\ 1} = .23$, $p < .01$, $ß_{Sample\ 2} = .55$, $p < .001$, and job resources related negatively, $ß_{Sample\ 1} = -.21$, $p < .01$, $ß_{Sample\ 2} = -.24$, $p < .001$, to exhaustion. Job resources related positively to vigour, $ß_{Sample\ 1} = .29$, $p < .001$, $ß_{Sample\ 2} = .36$, $p < .001$. The relation between job demands and vigour was not significant, $ß_{Sample\ 1} = .10$, *ns*, $ß_{Sample\ 2} = -.05$, *ns*. Job demands and job resources explained 8% and 43% of the variance in exhaustion and 10% and 14% of the variance in vigour in Samples 1 and 2, respectively, which was somewhat lower compared to the amount of variance accounted for by the tripartite model.

DISCUSSION

This study aimed to advance the understanding of the associations between job characteristics and employees' well-being by integrating the JD-R model (Bakker & Demerouti, 2007) and the literature that differentiates between job hindrances and job challenges (e.g., Podsakoff et al., 2007). Elaborating upon the latter literature, we aimed to address the puzzling observation within the JD-R model that particular job demands (e.g., workload and cognitive demands) have been found to relate positively to employees' well-being (e.g., Mauno et al., 2007). Drawing upon the JD-R model, we furthermore aimed to address the failure to account for resourceful job characteristics in the literature on job hindrances and job challenges. Accordingly, the present study examined: (1) whether the category of job demands in the JD-R model can be broken down in job hindrances and job challenges; (2) whether, after controlling for the effects of job resources, these two categories yield a differential relation with employees' exhaustion and vigour, the complementary core characteristics of burnout and

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engagement (Bakker & Demerouti 2007); and (3) whether the hypothesized tripartite model explained more variance in employees' functioning, and specifically in vigour, compared to the traditional JD-R model.

Structure of job characteristics

In general, our results provided support for the hypothesized differentiation between the three proposed job characteristics categories. Within two quite diverse samples, the three-factor model including job hindrances, challenges, and resources provided a better fit to the data relative to the one-factor model or any other two-factor model, including the traditional JD-R model. Notably, the traditional model yielded a rather poor fit to the data.

The correlations between job hindrances, job challenges, and job resources in the tripartite model followed the expected pattern. First, job hindrances displayed a moderate positive relation with job challenges. In line with our hypothesis, this seems to indicate that, even though both types of job demands share some features, they are clearly distinct. Second, job challenges and job resources tended to be positively related, presumably because they share stimulating features. Third, job hindrances and job resources were negatively correlated. This finding is in line with the Conservation of Resources Theory (Hobfoll, 2002), which suggests that job hindrances may have a negative impact on job resources: When facing demanding circumstances, individuals must bring in resources to prevent loss, and individuals who have only limited resources are most likely to experience increases in job hindrances. Consider the example of an employee facing high emotional demands, who may make use of available job resources such as social support. In doing so, he might, however, burn up the social support, which makes him more prone to the negative impact of job hindrances. We would like to encourage future research to study the dynamic interplay between job hindrances and job resources and examine the process through which job resources may get undermined or be built up over time.

External validity of the extended Job Demands–Resources model

In a next step, we investigated the unique contribution of each of the job categories in explaining variance in employees' vigour and exhaustion. Perhaps the most important observation in this regard was that job hindrances and job challenges were differently related to employees' well-being, controlling for job resources. Specifically, job hindrances were positively related to exhaustion and negatively to vigour and may therefore be considered as truly health impairing.

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The status of job challenges is perhaps less clear. Job challenges related to optimal psychological functioning in the sense that they contributed in explaining vigour. Unexpectedly, they were not health impairing as they did not associate positively with employees' exhaustion. The latter finding is in contrast with previous results in the realm of the JD-R framework (e.g., Hallberg et al., 2007) and the stress literature (Lepine et al., 2005), which generally indicated negative relations between workload and cognitive demands and exhaustion. In line with the stress literature, we performed a supplementary analysis in which only job hindrances and job challenges were related to exhaustion and vigour. The results (available upon request from the corresponding author) revealed that the association between job challenges and exhaustion was also nonsignificant in Sample 2 and negative in Sample 1. These unexpected results might stimulate future research to gain further understanding of this relation. One possibility is that job challenges are only experienced as energy depleting over time. Another route for future research involves the possibility that job challenges are demanding in the sense that they require some effort expenditure and elicit fatigue, but do not yield an energy-depleting effect so that employees become completely exhausted. If so, it would suggest that effort expenditure rather than energy depletion is a more defining feature of the general category of job demands. Although all demands might require effort expenditure, not all expended effort might result in feelings of exhaustion. In sum, instead of yielding mixed relationships with employees' well-being, job challenges were shown to be stimulating. In general, however, the results supported the assumption that job hindrances, job challenges, and job resources related differently to vigour and exhaustion, thereby providing support for the external validity of the differentiation between two types of job demands.

Finally, in line with the JD-R model, job resources were associated with optimal psychological functioning, as they were positively associated with vigour and negatively with exhaustion in Sample 2. The dominance of temporary workers in Sample 1 may explain the lack of a relationship between job resources and exhaustion in Sample 1, as temporary workers generally show less strong relationships between job characteristics and well-being compared to permanent workers (e.g., De Cuyper & De Witte, 2006).

Comparison with the JD-R model

Breaking down the category of job demands into two subcategories seems to be instructive and necessary to gain understanding of the relationships between job demands and employees' well-being. The current findings are particularly important in light of the association between job demands and vigour, which has remained understudied in the JD-R model. Notably, the results of the traditional JD-R model in this study indicated that, if both

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types of job demands are collapsed into a single encompassing category, the respective positive and negative associations from job challenges and job hindrances to vigour will cancel each other out, resulting in a null relationship. An additional consequence of this added refinement to the classic JD-R model is that the tripartite model tended to explain more variance in vigour compared to the traditional JD-R model. This was particularly so in Sample 2. Whereas the JD-R model and the tripartite model explained equal amounts of variance in exhaustion in Sample 2, the tripartite model was also superior in explaining exhaustion in Sample 1. In sum, these results indicated that the differentiation between job hindrances and job challenges is not only necessary to understand the relationship between demanding job characteristics and vigour, but it is also instructive to gain more complete understanding of employees' well-being in general.

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Limitations and future research directions

This study has some limitations. First, generalizability of the current results to other professions and sectors needs to be demonstrated. In a first attempt to address this issue, we sampled employees with different professions, and in different organizations and countries. Although both samples differed considerably in the experience of particular job characteristics, similar results were found concerning the factor structure of these job characteristics categories and their relationships with employees' (ill-)health.

Second, all data were gathered through self-reports; hence, common method variance might have artificially inflated the strength of the observed relationships. In future research, this might be avoided by using objective rather than subjective assessments of job characteristics. However, as previous research has found similar relationships between employees' well-being and subjectively versus objectively measured job characteristics (e.g., Demerouti et al., 2001), we do not expect these limitations to significantly change our results.

Third, this study was cross-sectional in nature; therefore, no conclusions about the direction of the relations between the different types of job characteristics and employees' well-being can be drawn. Job hindrances, challenges, and resources might predict burnout and engagement over time, as evidenced in the JD-R literature (e.g., Hakanen et al., 2008). Alternatively, burnout and engagement may lead employees to seek out particular job characteristics or see them as more prevalent, as was recently shown by De Lange, De Witte, and Notelaers (2008). Although causality is an important issue to be addressed in future longitudinal research, we feel that the particular contribution of this study lies in the theoretical development of the qualitative differentiation of job hindrances, challenges, and resources.

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Fourth, even though we feel confident that our selection of job characteristics is most relevant in view of analysing job characteristics in different professions, we realize that there are other job demands that are potentially interesting in the realm of the JD-R model. Computer problems, for example, might represent a job hindrance, whereas changes in one's job might represent a job challenge. Furthermore, building upon the stress literature (Lepine et al., 2005; Podsakoff et al., 2007), future studies might examine job scope and responsibility as potential job challenges, and role problems, interpersonal conflicts, and hassles as potential job hindrances. Such research might help to extract the common features of the job characteristics belonging to the same category and sharpen the definition of the job characteristics categories. Research clarifying the distinction between job hindrances and job challenges might benefit from accounting for the psychological processes they elicit as noted in Table 1. As a rule of thumb, job features that require a lot of energy without yielding additional benefits may be considered as job hindrances, whereas job challenges yield additional beneficial outcomes in terms of goal achievement, need satisfaction, or well-being.

Finally, this study did not address the mechanisms through which job hindrances, job challenges, and job resources relate to well-being. Future research might examine whether the different types of job characteristics are indeed related to differences in expectancy, as suggested based on Expectancy Value Theory (Lepine et al., 2005; Vroom, 1964), or related differently to goal achievement or the satisfaction of the basic psychological needs of autonomy, competence, and relatedness, as hypothesized based on Self-Determination Theory (Deci & Ryan, 2000).

Another route for future research could be to focus upon individual differences. In line with the JD-R tradition and the literature differentiating between job hindrances and job challenges, we hypothesized that an objective differentiation can be made between the different types of job demands: Some job demands will generally be experienced as hindering, and others as challenging. Future research might, however, explore whether individual differences (e.g., personality or personal resources such as hope and optimism; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007) might cause any variability in this general trend. Notably, although numerous studies in the realm of the JD-R model reported positive relationships between job challenges and work engagement (e.g., Bakker, Demerouti, & Schaufeli, 2003b; Bakker et al., 2005b; Bakker et al., 2006; Hallberg et al., 2007; Van den Broeck et al., 2008), some studies have also reported negative (e.g., Hakanen et al., 2006) or zero-order relationships (e.g., Llorens, Schaufeli, Bakker, & Salanova, 2007; Montgomery, Peeters, Schaufeli, & den Ouden, 2003; Schaufeli & Bakker, 2004). These findings might hint at some moderators of the relationship between job challenges and work

engagement. Future studies may therefore examine more closely the existence of interindividual or intraindividual differences in the relationship between job hindrances, job challenges, and work-related well-being.

CONCLUSION

Drawing on JD-R research (Bakker & Demerouti, 2007) and the stress literature (Podsakoff et al., 2007), this study reconsidered the categorization of job demands within the JD-R model. Although job characteristics models should not be overly complicated (van Veldhoven et al., 2005), the results of the present study provide evidence that it might be instructive and even necessary to differentiate between job hindrances and job challenges in the JD-R model. At the practical level, our findings refine suggestions along the JD-R model to increase job resources and to decrease job demands (e.g., Bakker & Demerouti, 2007). Specifically, the present findings suggest that job hindrances need to be reduced, whereas job challenges must not necessarily be decreased, as they play, together with job resources, a key role in the enhancement of employees' vigour.

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