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Job Demands–Resources Theory: Frequently Asked Questions

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Job demands–resources (JD–R) theory is commonly used to predict employee well-being, work behaviors, and performance. This article provides a short description of JD–R theory and discusses issues and questions that have been raised regarding the theory. These issues include the differences between conservation of resources theory and JD–R theory, whether a job resource can be a job demand, the impact of job resources on strain and health, the role of hindrance and challenge job demands in JD–R theory, the relationship between job demands and resources, and the likelihood of work engagement being a redundant concept. We also discuss whether JD–R theory can be falsified, the role of personality in the theory, within- and between-person effects in JD–R theory, the question whether there is a standard JD–R questionnaire, and the existence of loss and gain spirals. Finally, we discuss the use of JD–R theory in domains other than work and answer the question whether JD–R theory is universally applicable.

Keywords: burnout, job demands–resources theory, job design, job resources, work engagement

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Research of the past century has shown that work design can have an important impact on employee well-being and performance (Parker et al., 2017). Moreover, the design of workplaces has become increasingly relevant, given the ongoing evolution of work due to societal changes and technological advancements. Simultaneously, organizations try to focus on well-being and work–life balance so that their employees feel engaged and committed. The ongoing transformation of work continues to pique the interest of scholars and practitioners in job design theories, reflecting the need for innovative approaches to job design. Since its inception at the turn of the millennium, the job demands–resources (JD–R) model (Demerouti et al., 2001) has become an influential theory (Bakker & Demerouti, 2017; Bakker, Demerouti, & Sanz-Vergel, 2023; Demerouti & Bakker, 2023) explaining employee well-being and performance. Although the theory seems simple, there are several issues that need clarification in order for the theory to be applied in the way that it makes the best predictions. In the present article, we briefly describe the conceptual framework of our theory and focus on important unanswered questions.

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JD–R Theory in Brief

JD–R theory (Bakker & Demerouti, 2017) is a job design theory that explains how various aspects of the physical and social work environment (job demands and resources) influence job performance through employee well-being. The theory also outlines how employees use proactive as well as reactive work behaviors to influence job demands and resources and, indirectly, their own well-being (Bakker, Demerouti, & Sanz-Vergel, 2023). The core of JD–R theory consists of seven propositions. First, and different from classic job design theories such as job characteristics theory (Hackman & Oldham, 1976) and the Michigan model (French et al., 1982), JD–R theory is a flexible theory. JD–R theory does not propose a fixed set of job characteristics to be important for employee well-being and performance but rather acknowledges that all organizations/occupations are unique and may be characterized by different job demands and resources. Job demands refer to aspects of the job that require effort and are therefore associated with physiological (heart rate, oxygen consumption) and/or psychological (fatigue, anxiety) costs (Demerouti et al., 2001). Job resources refer to the physical, psychological, social, or organizational aspects of the job that have motivating potential, such as constructive feedback, skill variety, and social support from colleagues. Job resources are functional in achieving work goals, alleviating the impact of job demands, and encouraging learning and personal development (Bakker, Demerouti, & Sanz-Vergel, 2023).

A second proposition of JD–R theory is that job demands and resources instigate two distinctive processes. The health impairment process refers to the unique impact of job demands (e.g., complex work problems, email overload) on health outcomes through the depletion of employees' physical, emotional, and cognitive resources (e.g., Demerouti et al., 2001; Li et al., 2023). This process seems to work particularly over a longer period of time. Thus, when employees are continuously confronted with difficult tasks that are cognitively taxing or high numbers of emails that constantly need

attention, they use up so much energy that short-term fatigue becomes chronic and serious health problems may arise. In contrast, the motivational process refers to the unique impact of job resources (e.g., decision latitude, time control) on performance through work engagement (e.g., Hakanen et al., 2008; Schaufeli et al., 2009). Job resources can satisfy basic psychological needs, such as the need to belong and the need to do something meaningful in an autonomous way (Van den Broeck et al., 2008). This fosters intrinsic motivation to reach work-related goals and facilitates persistence and performance (Kovjanic et al., 2013; see also Lesener et al., 2020).

The third proposition of JD–R theory is that job demands and resources have a combined impact on employee well-being (including burnout and work engagement). There are two interaction effects. The buffer hypothesis proposes that job resources weaken the impact of job demands on strain. There may be various reasons for this; job resources may change the perception of job demands, moderate the responses that follow the appraisal process, or reduce the health-damaging consequences of such responses (Bakker, Demerouti, & Sanz-Vergel, 2023). Indeed, job resources like social support and performance feedback can mitigate the impact of various job demands (workload, cognitive demands, interpersonal conflicts, etc.) on psychological distress and burnout (e.g., de Jonge & Huter, 2021; Lavoie-Tremblay et al., 2014). In contrast, the boost hypothesis in JD–R theory proposes that challenging job demands strengthen the positive impact of job resources on work engagement. Particularly when employees need to deal with challenging job demands (e.g., work complexity, time pressure), they can benefit from various job resources, including performance feedback and support from colleagues (Bakker et al., 2007; Hobfoll et al., 2018). In short, job resources become salient and are most important for work engagement when job demands are high.

Personal resources are positive self-evaluations that refer to individuals' sense of their ability to control and impact upon their environment successfully (Hobfoll et al., 2003). Proposition 4 in JD–R theory states that personal resources have a reciprocal relationship with job resources. This means that employees with higher levels of optimism, self-efficacy, and resilience are likely to also have access to more job resources, and vice versa. Personal resources can also qualify the impact of job demands on employee well-being (Proposition 5). When employees are optimistic and self-efficacious and believe they have an impact on their work environment, they are better able to deal with various types of job demands. For example, using a weekly diary study among nurses, Bakker and Sanz-Vergel (2013) predicted and found that emotional job demands (emotionally laden interactions with patients that were identified as challenging for nurses in a separate study) resulted in higher levels of work engagement when self-efficacy and optimism were high. However, emotional job demands resulted in lower levels of work engagement when these personal resources were low.

JD–R theory proposes that employees may also proactively change their job design and optimize their own job demands and resources (Proposition 6). This process of employees shaping their jobs is called job crafting (Wrzesniewski & Dutton, 2001). Tims and Bakker (2010) showed that employees can engage in various types of proactive behavior, including role innovation, feedback seeking, and task revision. They defined job crafting as employees' personal initiative to change their job demands and job resources in order to better align the design of the job with their own abilities and preferences. Job crafting increases person-job fit and has a positive impact on meaningfulness and work engagement (Tims et al., 2016; van Wingerden et al., 2017). Moreover, research of the past decade has shown that when employees make small adjustments to their daily job demands and resources (e.g., acquiring support and feedback, starting a new project, proactively looking for a silent workplace to focus), their daily well-being and job performance increases (e.g., Demerouti & Bakker, 2024; Oprea et al., 2019).

Whereas job resources and work engagement may encourage employees to be proactive, JD–R theory proposes that job demands and strain may lead to maladaptive self-regulation cognitions and behaviors (Bakker & de Vries, 2021; Proposition 7). When employees experience higher levels of job strain, they find it more difficult to focus and make more work-related mistakes (Oosterholt et al., 2012). In addition, the negative emotions (e.g., anger, irritation) experienced by employees under stress may narrow their thought–action repertoire (Fredrickson & Branigan, 2005). Thus, when job demands are persistently high, employees may start to use destructive strategies like avoidance coping and self-undermining. That is, they create new obstacles that may compromise their job performance (Bakker & Wang, 2020; Roczniewska & Bakker, 2021). Examples are poor communication, making careless mistakes, and starting interpersonal conflicts (Bakker & Costa, 2014).

Frequently Asked Questions

JD–R theory is a popular theory that is used to predict and change employee well-being, work behaviors, and performance. Core JD–R publications (Bakker & Demerouti, 2007, 2008, 2017; Bakker, Demerouti, & Sanz-Vergel, 2023; Demerouti et al., 2001; Schaufeli & Bakker, 2004) have generated myriads of citations—indicating that the theory is widely used in empirical research. Moreover, JD–R theory is actively applied by managers, consultants, human resources professionals, and other work experts who have developed risk assessment tools, workshops, seminars, trainings, smartphone apps, and organization-wide interventions (Bakker & Demerouti, 2017; see also Aguinis et al., 2012). In their attempts to apply the theory, scholars and practitioners have faced several issues, sometimes turning to us for assistance. In the following overview, we answer the most frequently asked questions.

What Is the Link Between JD–R Theory and Conservation of Resources Theory?

JD–R theory stands on the shoulders of giants. It builds on classic job design theories, including two-factor theory (Herzberg, 1966), job characteristics theory (Hackman & Oldham, 1976), and the demand-control model (Karasek, 1979). JD–R is clearly an organizational psychology theory. Although JD–R theory can also be applied outside the work domain (e.g., in educational and sports contexts—as will be discussed later), it has most often been used in organizational settings. In contrast, conservation of resources (COR) theory (Hobfoll, 1989; Hobfoll et al., 2018) is a general stress theory that has also been applied to the work domain. The central idea in COR theory is that human beings need resources for survival, and, therefore, all humans attempt to obtain, retain, foster, and protect resources. Resources are broadly defined as all the things individuals centrally value and may include objects (e.g., power tools, a car), conditions (e.g., marriage, employment), and skills or beliefs

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(e.g., sociability, self-efficacy). Resources may also be more volatile and take the form of physical energy, attention, or time.

COR theory is basically a theory with propositions regarding what people do when they anticipate losing or actually lose resources. This is typically a situation of change—one possesses certain resources and then loses them. An important principle of COR theory is that people must invest resources in order to (a) protect against resource loss, (b) recover from losses, and (c) gain new resources (Hobfoll, 1989; Hobfoll et al., 2018). COR's gain paradox principle, stating that resource gain increases in salience in the context of resource loss, is directly relevant for the buffer hypothesis in JD–R theory. Accordingly, job resources moderate (alleviate) the impact of job demands on strain. This hypothesis has been based on Karasek's (1979) demand-control model, but it is evident that employees lose various volatile resources (energy, attention, time) on the days they encounter high job demands and that, particularly on these days, various job resources can be extremely helpful. The difference between JD–R theory and COR theory is that JD–R theory is more explicit in explaining which type of resources are needed (resources in the work environment, called job resources) to deal with job demands in order to prevent a depletion of volatile psychological resources and protect well-being.

The boost hypothesis in JD–R theory is directly based on COR's gain paradox principle. Accordingly, job demands strengthen the motivating potential of job resources. Particularly on the days when employees face a high work pressure, complex work tasks, or emotionally challenging clients, they will benefit from available job resources, like decision latitude and support from colleagues. However, what COR theory seems to propose more specifically is that on the days when job demands are relatively high (and employees thus lose volatile resources including energy, time, and attention), it becomes more important to protect and mobilize available job resources and actively seek new job resources—implying expansion-oriented job crafting. This is paradoxical because it implies that employees need to become more active when they are low on psychological resources—making it more difficult to engage in adaptive coping and proactive behavior (Bakker & de Vries, 2021).

Finally, the loss and gain spirals in JD–R theory are based on COR-theory. However, JD–R theory explicitly models loss and gain processes (e.g., Bakker & Costa, 2014). The loss cycle implies that job demands evoke self-undermining behaviors through job strain and that self-undermining, in turn, increases future job demands. The gain spiral implies that job resources encourage job crafting (or other proactive behaviors) through work engagement and that job crafting, in turn, increases future job resources. Research has suggested that the loss cycle is stronger for individuals who are already high on chronic burnout (Bakker, Xanthopoulou, & Demerouti, 2023; Roczniewska & Bakker, 2021). Similarly, the gain cycle is stronger for individuals who are already high on work engagement (e.g., Bakker, 2018; Bakker & Oerlemans, 2016).

Can a Job Resource Be a Job Demand?

This question pops up regularly, and the forthright answer is no. Job demands are all aspects of work that cost effort and therefore consume energy (Demerouti et al., 2001, 2019). Job demands instigate the health impairment process. In contrast, job resources are not directly involved in the health impairment process because resources do not generate energy but rather spark motivation. Job resources buffer the impact of job demands on strain because job resources generate the motivation to effectively deal with these demands (Bakker et al., 2005). When job resources are low—for example, when employees receive limited support from others or have reduced control over the pace of their work—employees' work engagement and intrinsic motivation usually decrease. When employees do not have access to resources, they are less able to regulate their energy through proactive behaviors such as job crafting and playful work design (e.g., Bakker & de Vries, 2021; Scharp et al., 2019). In short, a low score on job resources is not the same as a high score on job demands.

In a similar way, a low score on job demands is not the same as a high score on job resources. When job demands such as workload and cognitive demands are low, employees need to invest only limited effort to carry out their work. This does not mean that work is more motivating—in contrast, work may actually be understimulating. Note that certain characteristics of the job may, in some cases, be characterized as job demand or job resource dependent on their positive or negative manifestation. An example is leadership that may manifest itself as constructive (e.g., transformational leadership) versus destructive behavior (e.g., abusive supervision). Whereas transformational leaders are inspiring, take perspective, and are intellectually stimulating (Bass, 1999), abusive leaders humiliate their employees, remind them of their past mistakes, and put them down in public (Tepper, 2007). Such constructive and destructive leadership behaviors behave as job resources and job demands, respectively—as evidenced by a recent meta-analysis showing unique effects on work engagement, burnout, and performance (Pletzer et al., 2024). In this example, leader behavior manifests itself in two completely different ways, implying that leader behavior can be a job demand or a job resource. However, also here, a low score on transformational leadership is not a demand, and a low score on abusive supervision is not a resource.

Another example is job insecurity, as the literature does not really give an answer to the question whether job security is the opposite of job insecurity or whether both are the ends of the same continuum. The confusion is sustained by the fact that scholars have used items that measure job security—(e.g., "I am sure I can keep my job"—Vander Elst et al., 2014) in order to capture job insecurity. In order to understand the function of job security, we turn to International Labour Organization standards (Convention No. 158 and Recommendation No. 166), which suggest that worker employment should not be terminated unless there is a valid reason for such termination. This would imply that employers should provide job security for their employees, but this will not necessarily increase their work motivation (which also applies to an ergonomically designed desk). Employees will experience an insecure job as a result of high job demands, which also applies when they work in an office that is not ergonomically designed.

What Impact Do Job Resources Have on Strain and Health?

Although JD–R theory proposes that job demands are uniquely related to strain and health (health impairment process) and that job resources are uniquely related to work engagement (motivational process), several meta-analytic studies have reported a direct negative relationship between job resources and burnout

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(e.g., Alarcon, 2011; Crawford et al., 2010; Lesener et al., 2019). This may suggest that job resources are directly involved in the health impairment process. However, we believe that previous JD–R research has not tested the unique effect of job resources on strain in the best possible way.

First, JD–R theory predicts that job resources are negatively related to strain (e.g., exhaustion) through their relationship with work engagement. However, if this indirect effect is not modeled, scholars may find a direct effect of job resources on strain. Second, earlier studies often used overall measures of burnout, indicated by exhaustion (a clear marker of strain), as well as cynicism and reduced personal accomplishment (markers of reduced motivation). When a burnout measure includes markers of motivation, it can be expected that job resources are directly related to burnout—because resources have motivating potential. This cannot be taken as evidence for the idea that resources directly influence strain. Third, previous research has overlooked the possibility that employees who have access to more job resources may actually be exposed to lower levels of job demands (or may perceive fewer demands) and therefore experience reduced strain. In this case, the direct effect of job resources on strain is actually an indirect effect through job demands. Fourth, it is conceivable that the direct link between job resources and strain is an artifact of the method and is actually due to the statistical interaction with job demands. According to JD–R theory, job resources buffer the positive impact of job demands on strain. However, if the JD–R interaction term is not included in the prediction, we may instead observe the main effect of job resources on strain (e.g., exhaustion). Another possibility is that the variance in job demands may be limited—for example, because most employees included in the sample experience high levels of job demands (see Figure 1). In that case, the Job Demands × Resources interaction effect is masked since really low job demands are not observed. Nevertheless, given the available evidence (Alarcon, 2011; Crawford et al., 2010; Lesener et al., 2019), a direct effect of job resources on strain cannot be ruled out and may make sense in practice. When employees have access to many social job resources (social support, constructive feedback, inspirational leadership), they may be influenced by the physical and emotional energy of their coworkers (Owens et al., 2016). Energetic colleagues can increase employees' levels of energy (and lower their levels of exhaustion) through an emotional contagion process (Bakker, 2022). In addition, JD–R theory proposes that job resources facilitate personal resources (e.g., self-esteem, self-efficacy, optimism), which are related to positive health (e.g., Boudrias et al., 2011). Future research may specifically focus on the job resources—health link and use robust tests to rule out the alternative explanations discussed here.

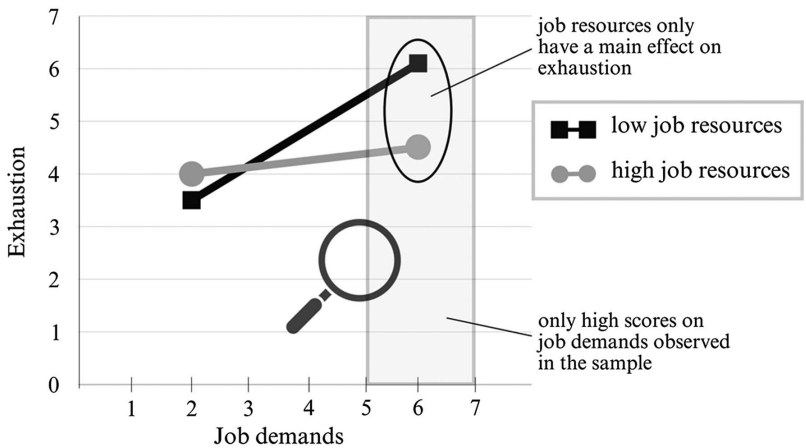
What Is the Role of Hindrance and Challenge Job Demands in JD–R Theory?

In JD–R theory, job demands are defined as all aspects of the job that necessitate continuous effort and are therefore associated with physiological and/or psychological costs (Demerouti et al., 2001). However, researchers have suggested and partly shown that some job demands may also benefit employees. According to the challenge–hindrance stressor framework (Cavanaugh et al., 2000; Podsakoff et al., 2023), challenge job demands offer opportunities for personal growth and achievement. Examples are complexity, time pressure, and responsibility. Such challenge demands may stimulate employees, fostering a sense of accomplishment and development. In contrast, hindrance job demands hinder personal growth and achievement and obstruct the attainment of goals. Examples are role ambiguity, administrative hassles, and interpersonal conflict. Consistent with JD–R theory, meta-analyses have shown that, irrespective of whether they are classified as challenging or hindering, stressors are demanding and necessitate the expenditure of effort and energy to be managed effectively. Thus, both challenges and hindrances can result in energy depletion and health impairment if they are too high or chronic. However, whereas hindrance job demands undermine work engagement, motivation, and task performance, challenge job demands may have additional favorable effects on these outcomes (e.g., LePine, 2022; Podsakoff et al., 2023).

The distinction between challenge and hindrance job demands needs further clarification. First, whether a job characteristic is experienced as a challenge or hindrance requires the interpretation of the employee. This increases the subjectivity of the categorization

Figure 1

High Levels of Job Demands May Mask the Job Demands × Resources Interaction Effect on Exhaustion



of job demands and job resources, which is, from a practical point of view, confusing for organizations. Second, Bakker and Sanz-Vergel (2013) argued and found that nurses perceived work pressure more as a hindrance demand than as a challenge demand and that the reverse was true for emotional demands. In a second study, they showed that work pressure undermined the positive impact of personal resources on flourishing and that emotional demands strengthened the positive effect of personal resources on work engagement. These findings illustrate that the occupational sector can change the perception of job demands. From a job design point of view, it is important to note that both types of job demands can prompt the hypothesized health impairment process and result in strain and health problems. When job demands are perceived as challenges, they may also have positive outcomes.

According to JD–R theory, the differential effects of challenges and hindrances on work engagement and other favorable outcomes may depend on the level of job resources. Since challenges are motivating but cost considerable effort, resources can boost the positive impact of challenge job demands on work engagement and performance. In contrast, hindrances are frustrating, and employees need resources to buffer the negative impact of hindrance job demands on work engagement and other outcomes. Consistent with these assumptions, Tadić et al. (2015) found that teachers were more inspired, excited, and engaged on the days they had to work hard and needed to solve complex problems—but only when these challenges were accompanied with daily job resources (e.g., constructive feedback, social support). This is consistent with the boost hypothesis in JD–R theory. Additionally, Tadić et al. showed that teachers were less inspired and engaged on the days they were confronted with hindrance demands, such as role conflict and hassles—but this negative effect was most pronounced when teachers had limited access to daily job resources. This is consistent with the buffer hypothesis in JD–R theory's proposition that job resources can buffer the impact of job demands. In a similar vein, Breevaart and Bakker (2018) found that challenge demands were most strongly positively related to daily work engagement when employees interacted with a leader who used individual consideration, intellectual stimulation, and inspiration (i.e., transformational leadership behaviors). In addition, Breevaart and Bakker's research revealed that hindrance demands, such as role conflicts, undermined daily work engagement, particularly when leaders exhibited few transformational leadership behaviors.

How Are Job Demands Related to Job Resources?

Usually, job demands and resources are negatively related. The reason is that when job demands are high, there is only limited time to mobilize, utilize, and exchange job resources with colleagues. When all psychological and physical effort is invested in a complex work task, there is no room to solicit customer feedback or socialize with colleagues. Also, when job demands are high, there is very little opportunity to exchange resources with colleagues, such as information, feedback, and support. Indeed, the meta-analysis by Lesener et al. (2019) showed negative correlations between job demands and job resources within time (simultaneous effects) and across time (lagged effects). Thus, when quantitative, emotional, and cognitive demands were higher at Time 1 (T1), various job resources such as social support, autonomy, and leadership quality were lower at Time 2 (T2). Similarly, when T1 job resources were higher, T2 job demands were lower. Note that Lesener and colleagues did not conduct formal tests of reciprocity regarding demands and resources.

In a study among almost 300,000 federal government employees working in one of 38 different U.S. agencies, Jong and Ford (2016) found that agency-level job demands (i.e., workload) had a negative impact on individual-level job resources at a later point in time (1–3 years later). Collective workload resulted in decreased individual levels of cooperation and empowerment (i.e., influence over work processes and strategic decisions). In addition, agency-level job resources (empowerment, cooperation, supervisory feedback) had a negative impact on individual-level job demands (workload, ambiguity) over time. These findings suggest that job demands and job resources are reciprocally and negatively related.

Bakker and de Vries (2021) have argued that job demands are negatively related to job resources through a process of accumulating strain and decreased adaptive regulation (job crafting, recovery; see also Sonnentag et al., 2017). When job demands increase, employees experience fatigue or anxiety that impairs self-regulation. Because stressed workers do not recover well and do not craft their jobs, they eventually end up with fewer resources to deal with future job demands. However, it should be noted that the relationship between job demands and resources may depend on the job position or organizational context. For instance, most managers have high job demands but also high job resources to help them deal with these demands. The relatively high resources are, in this case, part of the job and may naturally covary with the high job demands. Indeed, Bakker et al. (2004) found in their study among highly educated employees working in different occupational sectors that job demands and resources (e.g., work pressure and autonomy; emotional demands and opportunities for development) were positively related.

Is the Work Engagement Concept Redundant?

One concept that plays a central role in JD–R theory is work engagement—an affective–motivational state that is characterized by high levels of energy (vigor), enthusiasm regarding the content of work (dedication), and focused attention on work activities (absorption; Schaufeli & Bakker, 2022). Since work engagement was introduced in the literature (Schaufeli et al., 2002), there is an ongoing debate about its relationship with burnout—also an affective motivational state that is characterized by chronic fatigue (exhaustion), a negative attitude toward work (cynicism), and reduced professional efficacy (Maslach & Leiter, 2008) or reduced ability to regulate cognitive and emotional processes (Schaufeli et al., 2020).

Some scholars have argued that work engagement is indicated by low scores on burnout (Cole et al., 2012; Maslach & Leiter, 2008). However, employees low on burnout are not necessarily highly engaged during work, and those who are low on work engagement do not necessarily feel burned out (Schaufeli & De Witte, 2017). Theoretically, this can be illustrated using the circumplex model of emotions (Russell & Carroll, 1999). Accordingly, emotions (and also employee well-being; Bakker & Oerlemans, 2011) can be categorized as being (a) negatively or positively valanced and (b) active or passive. Whereas work engagement is a highly activated and positive form of well-being, burnout is a passive and negative form of well-being. It seems evident that employees may be neither

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enthusiastic nor cynical—they may feel indifferent toward work (technically, they score low on work engagement and low on burnout). This stoic attitude is related to the phenomenon of "quiet quitting"—simply doing the work that is expected of the position without going above and beyond what is expected (Scheyett, 2023).

Crawford et al. (2010) used 43 studies, including almost 27,000 employees, to test a meta-analytic structural JD–R model. They found that the meta-analytic correlation between work engagement and burnout was only −.37. Nahrgang et al. (2011) conducted a meta-analysis based on 203 independent samples ($N = 186,440$) to study work engagement and burnout in the context of safety at work. These authors found a meta-analytic correlation of −.25. Finally, Lesener et al. (2019) used 57 independent samples ($N = 37,324$) to conduct a meta-analysis of longitudinal JD–R studies and found a meta-correlation between T1 work engagement and T2 burnout of −.36. The correlation between T1 burnout and T2 work engagement was exactly the same. These findings indicate that both concepts share only limited variance and cover unique psychological phenomena.

Furthermore, JD–R studies have shown that work engagement and burnout have unique predictors and outcomes (Bakker, Demerouti, & Sanz-Vergel, 2023). Whereas work engagement is typically the highest when employees have access to an abundance of job resources—combined with high challenge job demands (e.g., work pressure, task complexity), burnout is typically the highest when employees are confronted with high job demands—combined with a lack of job resources. Thus, there are unique combinations of job characteristics that are responsible for work engagement and burnout. It should also be noted that whereas engaged workers take personal initiative and craft their jobs so that they stay engaged (i.e., a gain cycle; Bakker, Demerouti, & Sanz-Vergel, 2023; Hakanen et al., 2008), burned out workers show self-undermining behaviors leading to increased job demands and even higher burnout levels (Bakker, Xanthopoulou, & Demerouti, 2023). On the basis of these findings, we can conclude that the work engagement construct is not redundant. Instead, work engagement plays an important role in the organizational psychology and management literatures. It is also a better predictor of job performance than burnout (Bakker, Demerouti, & Sanz-Vergel, 2023).

Can JD–R Theory Be Falsified?

JD–R theory is one of the most-cited theories in management and organizational psychology, and research has provided extensive empirical support for the predictive value of the theory. However, the theory's propositions may seem to be obvious and self-evident. Indeed, it makes sense that employees who are exposed to higher job demands should also be more likely to feel tired and experience job strain. Also, employees who have access to many job resources should also be more likely to be motivated and perform well than employees who do not have access to such resources. Because the propositions in JD–R theory seem intuitively reasonable, their falsifiability is sometimes questioned. One could argue that most research will confirm the self-evident hypotheses of the theory. When some studies do not consistently support the hypotheses, we may be tempted to point the finger at the studies' design and methods. We agree with Ajzen (2020, p. 321) that "there is nothing wrong with a theory that is intuitively reasonable." Although there is potential for theories and studies that investigate unexpected and surprising phenomena, when developing a broad theory of employee well-being, it is less likely that we will discover many remarkable propositions that can withstand empirical testing.

It should be noted, however, that JD–R theory has been modified and refined on the basis of emerging research findings. For example, in the first decade of JD–R theory, scholars have found reciprocal relationships between (a) job demands and strain (e.g., Bakker et al., 2000; Demerouti, Bakker, & Bulters, 2004) and (b) job resources and work engagement (Hakanen et al., 2008; Xanthopoulou et al., 2009). This has informed the novel idea that job demands and strain may lead to maladaptive self-regulation cognitions and behaviors (i.e., self-undermining; Bakker & Costa, 2014; Bakker & Wang, 2020) and that job strain can instigate a loss cycle (Bakker, Xanthopoulou, & Demerouti, 2023). In a similar vein, these findings have informed the idea that job resources and work engagement may increase proactive work behaviors (e.g., job crafting, playful work design) and that work engagement can prompt a gain cycle in which proactive behaviors lead to more resources and higher levels of engagement over time (Bakker, 2010; Reis et al., 2015). Thus, the theory has been changed and expanded on the basis of the finding that job demands and resources do not only have a causal impact on outcomes, but these outcomes also predict job demands and resources. JD–R theory is open to change based upon new research.

Moreover, JD–R theory contains several less evident propositions that can be tested empirically. Among other things, it predicts a number of mediating and moderating processes: (a) Exhaustion mediates the effects of various job demands on performance, whereas work engagement mediates the effects of various job resources on performance; (b) job and personal resources moderate the effects of job demands on job strain; (c) job demands moderate the effects of job resources on work engagement; (d) job crafting mediates the effect of work engagement on job and personal resources; (e) self-undermining mediates the effect of exhaustion on job demands; (f) job crafting influences job resources, which then moderate the effect of job demands on job strain (mediated moderation); (g) self-undermining influences job demands, which then moderate the effect of job resources on work engagement; (h) stable personality moderates the within-person effect of job demands on self-undermining, through job strain; (i) stable personality characteristics moderate the within-person effect of job resources on job crafting through work engagement. Methodologically sound empirical research that disconfirms these propositions would falsify the theory.

What Is the Role of Personality in JD–R Theory?

In a volatile, uncertain, and ambiguous world, job demands and resources may rapidly change. Indeed, research of the past 2 decades has shown that job demands such as work pressure and task complexity change even from day to day (Downes et al., 2021). Similarly, job resources such as colleague support and skill variety may be available on 1 day and lacking on other days (Xanthopoulou & Bakker, 2021). Furthermore, JD–R theory proposes that on days employees are more engaged in their work, they are more likely to use job crafting and—in this way—mobilize new jobs and personal resources (Demerouti & Bakker, 2024; Tims et al., 2014).

In contrast to daily job demands, resources, and employee behaviors, personality refers to characteristic, enduring patterns of thought, emotion, and behavior that are expressed in a variety of situations (Costa & McCrae, 1992). Personality is relatively stable

over time and influences a person's interactions with, and adaptations to, the external environment (Larsen et al., 2017). The five-factor model of personality (Costa & McCrae, 1992) can be used to describe the most salient aspects of personality: openness, conscientiousness, extraversion, agreeableness, and emotional stability.

The multilevel version of JD–R theory (Bakker, 2015; Bakker, Demerouti, & Sanz-Vergel, 2023) describes the role of personality in JD–R theory. Accordingly, stable personality traits weaken (moderate) the positive relationships between daily or weekly job demands, exhaustion, and self-undermining. In addition, personality strengthens the positive relationships between job resources, work engagement, and proactive work behaviors. Supporting these effects, Debusscher et al. (2016) showed that the trait emotional stability weakened the relationship between momentary job demands and negative emotions (momentary neuroticism). Momentary job demands such as work pressure and task complexity particularly evoked negative emotions when the trait emotional stability was low (vs. high).

In a similar vein, Oerlemans and Bakker (2014) found that individuals who scored high (vs. low) on extraversion were the happiest on days they spent considerable time on paid work activities or athletic activities, particularly when they carried out these activities with other people. Scharp et al. (2019) found that daily proactive and playful work design was positively related to daily work engagement and creativity when employees scored high (vs. low) on Openness. In short, although personality may influence the choice for certain occupations and hence the prevalence of job demands and resources (Denissen et al., 2018), once employees have become socialized to their organization, their stable personality determines the impact of daily fluctuations in job demands and resources on daily fluctuations in employee well-being and the impact of daily work behaviors on daily job design and well-being.

One other way in which personality could play a role in JD–R theory is by influencing whether employees perceive a job characteristic as a hindrance, challenge, or resource. For example, individuals scoring low on emotional stability may perceive performance feedback as threatening and stressful, and, hence, feedback could potentially act as a job demand and lead to strain (but see Bell & Arthur, 2008). In a similar vein, individuals scoring high on openness to new experiences may perceive role ambiguity as an opportunity to take initiative and learn new things. Future research should further test whether personality can change the perception and function of job demands and resources.

Do Within- and Between-Person Effects Differ in JD–R Theory?

Between-person research shows that some individuals have a high level of job demands and others have lower levels (e.g., Demerouti et al., 2001), leading to between-individual variation in individual outcomes. This between-person perspective focuses exclusively on average levels of job demands, resources, and outcomes. In contrast, within-person research recognizes within-person variation in demands/resources (e.g., Bakker & Sanz-Vergel, 2013) but focuses primarily on the variable effects of daily job characteristics without fully considering how day-to-day fluctuations in job characteristics manifest between individuals. In this way, the within-person perspective focuses solely on deviations from individuals' average levels of demands. Although both streams shed light on job demands, they each consider only one level in isolation. Thus, the two perspectives do not acknowledge the possibility that people experience variable job demands differently than they experience stable job demands (i.e., that the deviations give a new meaning to individuals' averages; Downes et al., 2021). Time does not represent a cause of change to which employees are reacting; instead, time is an ongoing context for understanding when one construct changing will lead to another construct changing (McCormick et al., 2020).

The meta-analysis by Downes et al. (2021) showed that the relationships between job demands/resources and outcomes (strain, work engagement) were similar on the within- and the between-person level. However, challenge demands had stronger positive effects on strain when employees encountered higher (vs. lower) levels of within-person challenge demand variability. These findings indicate that when higher levels of challenge demands are more variable, they present a more significant tax on psychological resources (and thus produce more strain) than do job demands that are more stable across employees' work experiences. According to Pitariu and Ployhart (2010), dynamics of change over time can be incorporated into hypotheses in terms of time (which acknowledges that a dynamic relationship exists and offers more temporal precision), duration (which emphasizes the idea that a dynamic relationship may change in magnitude over time), and shape (which specifies how a relationship between two constructs changes over time, e.g., curvilinear effects; trends, cycles, spirals, rhythms).

Is There a Standard JD–R Questionnaire?

The first proposition of JD–R theory is that every job has its own specific job characteristics that can be classified into job demands and resources. Because of the flexibility inherent in JD–R theory, it can be applied in every work context. Although specific demands and resources could be relevant for specific organizations, there is a set of demands and resources that are relevant in most organizations, such as workload, time pressure, autonomy, social support, and feedback (see also Hakanen et al., 2024). These job characteristics could be measured with a standard instrument, such as the one developed by the first author (Bakker, 2014). Also, there are validated instruments that can be used to measure work engagement (Utrecht work engagement scale; Schaufeli & Bakker, 2022), burnout (Oldenburg burnout inventory; Demerouti et al., 2010), job crafting (Tims et al., 2012; Petrou et al., 2012), and self-undermining (Bakker & Wang, 2020). Personal resources could be assessed with the PsyCap instrument (Luthans et al., 2014) or other instruments that measure specific personal resources, including optimism (Scheier & Carver, 1985), self-efficacy (Schwarzer & Jerusalem, 1995), resilience (Block & Kremen, 1996), and self-esteem (Pierce et al., 1989).

On the one hand, the existence of a standard JD–R instrument that assesses the essential parts of the theory may facilitate its application. On the other hand, standardization may restrict its ability to uncover the relevant processes that take place in a specific job, which, according to the theory, are initiated by the prevailing demands and resources. Moreover, such an instrument may restrict the creativity and the effort to focus on the specific context when applying the theory in order to uncover the specific and relevant demands, resources, and outcomes.

Bakker and Demerouti (2007) suggested that such an application requires the use of a two-stage procedure. The first, qualitative phase

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concerns explorative interviews with job incumbents from different layers of an organization (e.g., representatives from management, direct supervisor, staff). The interviews include open questions about the jobs of the interviewees and refer to their positive and negative aspects or aspects that consume or provide energy. The incorporation of a qualitative phase in the research is valuable because it potentially generates knowledge about unexpected, organization-specific job demands and job resources that will be overlooked by highly standardized approaches. In the second phase, the instruments to measure the relevant job demands, job (and personal) resources, and outcomes are selected or developed. When new scales for the assessment of job demands and resources have to be developed, researchers should ideally follow the guidelines for the validation of instruments (cf. Worthington & Whittaker, 2006): (a) clearly define what you want to measure, (b) generate an item pool (based on the interviews), (c) determine the format of the measure (where frequency format is preferred), (d) have experts review the initial item pool, (e) consider inclusion of validation scales, (f) administer items to a development sample, (g) evaluate the items, and (h) optimize scale length. The formulation of the items should be as factual and simple as possible.

Do Loss and Gain Spirals Really Exist?

COR theory proposes the development of cycles or spirals for both resource losses and gains. Loss spirals mean that employees who experience a loss of resources will experience a further loss of resources in an increasing fashion (Salanova et al., 2010) and that individuals are unable to protect the remaining resources and to offset additional losses (Bon & Shire, 2022; Hobfoll et al., 2018). Gain spirals mean that employees who experience resource gains will be able to gain even more resources and are likely to experience higher levels of resource gains (Salanova et al., 2010). For this group, it is easier to offset resource loss and to orchestrate additional resource gains (Bon & Shire, 2022; Hobfoll et al., 2018). Both loss and gain spirals indicate positive (self-reinforcing) feedback loops, where (a) there is a reciprocal relationship between different resources (defined as the coexistence of normal and reversed causation) and (b) the absolute levels of the respective resources decrease (in the case of loss spirals) or increase (in the case of gain spirals) over time (Salanova et al., 2010).

Although the notion of spirals is appealing and intuitive, there is relatively little empirical support. This may be due to the fact that testing reciprocal causal relationships is challenging in terms of research design and raises many methodological issues, including floor and ceiling effects. In one of the earlier studies suggesting a loss spiral, Bakker et al. (2000) found that general practitioners who were confronted with demanding patient contacts experienced a lack of reciprocity in the general practitioner–patient relationship, which depleted their emotional resources and resulted in a depersonalized attitude. Indicative of a loss spiral, baseline depersonalization predicted the intensity and frequency of patient demands 5 years later, after controlling for T1 patient demands. This finding suggests that general practitioners who attempted to gain emotional distance from their patients as a way of coping with their exhaustion evoked demanding and threatening patient behaviors themselves. Expanding these results, ten Brummelhuis et al. (2011) showed that financial consultants' baseline burnout influenced their levels of burnout 2 years later through an increase in job demands (e.g., work overload, work hours) and a decrease in job resources (e.g., social support, information). In a more recent study using a short-term perspective of five working weeks, Bakker, Xanthopoulou, and Demerouti (2023) showed that weekly job demands were related to self-undermining behavior through weekly burnout symptoms. These indirect effects were stronger for individuals who scored already relatively high on chronic burnout.

Other studies have suggested the existence of gain spirals. For example, Hakanen et al. (2008) found that job resources were positively and reciprocally related to work engagement and that work engagement was positively and reciprocally related to personal initiative—among other findings. In line with their broaden-and-build theory, Fredrickson and Joiner (2018) showed that positive (but not negative) affect was positively related over time to broad-minded coping, a coping strategy uniquely related to creative responding. This is, however, not evidence for gain spirals, as the levels do not necessarily increase for the participants. Perhaps it is possible to uncover such positive (negative) spirals for specific groups of individuals (e.g., newcomers in organizations who still need to socialize and learn), but such a pattern needs to be shown in future research. Next to within-individual processes, also between-individual processes may explain the development of spirals. For instance, emotional and behavioral contagion represents a social process in which employees exchange demands and resources (Bakker, 2022). Such a process may lead to statistical relations between the constructs over time due to this social mechanism but not necessarily because of a loss or gain spiral.

Can JD–R Theory Be Used Outside the Work Domain?

JD–R theory originally focused on job characteristics only. Over the years, it was applied outside of work in several ways. The idea that demands use energy and that resources trigger motivation and help dealing with demands can be applied in various life domains. Also, the health impairment and the motivational process can be used to predict well-being outside of work. More specifically, the JD–R theory has been applied to other domains in several ways. First, Demerouti, Geurts, and Kompier et al. (2004) applied JD–R theory to the home domain and found that job demands were most strongly related to work–home conflict, and home demands were primarily (albeit weakly) related to home–work conflict. Moreover, job control and particularly job support were associated with work–home facilitation, whereas home resources (home control and home support) were unrelated to any type of facilitation.

Second, ten Brummelhuis and Bakker (2012) introduced the work–home resources model. This model delineates how work influences home life and how home life influences work. Specifically, the model predicts that demands and resources in the work domain influence volatile personal resources such as energy and optimism, which in turn influence functioning at home. Similarly, demands and resources in the home domain are hypothesized to influence functioning at work through personal resources. Key resources and macroresources are theorized to moderate these effects. The evidence for the work–home resources model is steadily increasing, substantiating negative and positive spillover between work and home life domains (e.g., Du et al., 2018; Bakker et al., 2019).

Third, over the years, we have seen applications of JD–R theory in various life domains, including education (universities—Cao &

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Meng, 2023; schools—Sorkkila et al., 2020) and sport (Richardson & McKenna, 2020). The theory has been used to uncover the relevant demands and resources of the specific domain as well as to predict well-being. For instance, Sorkkila et al. (2020) showed that athlete students with higher levels of burnout experienced higher demands (i.e., school-related stress, inadequate recovery, disempowering coaching, and little social life outside of sport and school), whereas those with lower burnout reported higher resources (e.g., support from the school, team, family, and friends, as well as empowering coaching).

Finally, JD–R theory was recently extended to integrate the impact of crises into the propositions (Demerouti & Bakker, 2023). The extended JD–R theory suggests that employee health impairment is not only caused by high or unfavorably designed job demands but also by the interplay between organizational, home, and personal demands. Similarly, motivation does not only result from high job resources but also from the interplay of organizational, home, and personal resources. The buffering and boosting propositions of the JD–R theory are further suggested to occur across life domains; for example, job resources can buffer the impact of home demands on health outcomes, or home demands can exacerbate the impact of job resources on outcomes. In addition, not only individual strategies are suggested to modify the impact of demands and resources but also strategies used by the partner, the leader, and the organization/team.

Is JD–R Theory Universally Applicable?

JD–R theory originated in Europe, but over the past decades, the theory has been applied in many different countries across the globe. This raises the question whether there are cultural variations in the applicability of the theory. A recent meta-analysis (Rattrie et al., 2020) on national cultural values as moderators in JD–R theory provides some of the answers. The authors conducted a meta-analysis of 132 independent samples from 120 studies across five global regions (total $N = 101{,}073$), where the theory was tested. The results provided strong support for the direct job demands–burnout and job resources–engagement pathways. Furthermore, the various tests of the moderating roles of Hofstede's (2001) cultural dimensions (power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, long-term/short-term orientation, tightness/looseness) resulted in significant ($p < .05$) moderating effects for only four of the 24 tested interactions (17%)—particularly when controlling for design characteristics. Specifically, the findings indicated that (a) the job demands–burnout relationship was stronger in masculine cultures, (b) the harmful effects of job demands on burnout and work engagement were exacerbated in tight societies compared to loose societies, and (c) individualism (vs. collectivism) strengthened the positive effect of job resources on work engagement. Rattrie and colleagues speculated that job demands may have stronger unfavorable effects in masculine and tightly knit (restrictive) cultures because such cultures value career success (e.g., promotions, earnings) and may make it more difficult to distance oneself psychologically from work. In addition, they reasoned that members of an individualistic culture may be more motivated to use job resources in their own interest. In contrast, a member of a collectivistic culture prioritizes the needs of the group over those of the individual and is more focused on the objectives of the team and company than individual achievement.

On the basis of these findings, we can conclude that job demands and resources have largely similar effects across cultures, although cultural values can slightly modify the strength of the effects. However, it remains unclear how culture affects several other propositions in JD–R theory, such as those related to proactive work behaviors (e.g., job crafting, playful work design), self-undermining, and loss and gain spirals. Is personal initiative less appreciated in cultures with a high power distance? Do masculine cultures strengthen possible loss spirals of job demands, strain, and self-undermining? More research is needed across the globe, particularly in non-Western countries, to better understand the influence of culture on the levels of demands and resources, as well as their impact on employee well-being and employee behaviors over time.

Conclusions

Research has shown that job design can have a major impact on employee well-being and performance. Modern organizations therefore invest considerable effort and financial means in designing work environments that are challenging and resourceful. The managers of these organizations are most likely to successfully improve employee well-being, work engagement, and performance if their attempts to optimize job design are based on an established and empirically validated theoretical framework (for a similar argument, see Ajzen, 2020). JD–R theory is commonly used to predict employee well-being, behaviors, and performance and has received considerable empirical support in various meta-analyses (see Bakker, Demerouti, & Sanz-Vergel, 2023). This suggests that the theory is well-equipped to guide practical interventions aimed at optimizing job design. Indeed, several recent intervention studies have suggested that employee well-being and functioning can be improved by following the principles outlined in JD–R theory (e.g., Bakker & van Wingerden, 2021; Demerouti, 2023; Gordon et al., 2018; Holman & Axtell, 2016; van Wingerden et al., 2016).

JD–R theory is characterized by several unique features that may help explain its widespread use. First, unlike all other job design theories, JD–R theory is flexible regarding the specific demands and resources that need to be addressed. This implies that the theory is applicable to all occupational and national contexts. Second, the theory has been able to predict two crucial well-being indicators, namely burnout and work engagement. Organizations in public and private organizations want to understand the workplace causes of employee well-being to be able to keep their productive and talented workers and reduce personnel turnover. Work engagement (and reduced burnout) are also essential for creativity and performance (Kim et al., 2013). Third, JD–R theory explicitly defines the structural relationships between job design, well-being, reactive and proactive behaviors, as well as job performance. The proposed relationships can be tested in experimental research and field studies in a range of contexts. Finally, meta-analyses have provided considerable evidence for the validity of JD–R theory (e.g., Alarcon, 2011; Crawford et al., 2010; Lesener et al., 2019; Nahrgang et al., 2011; Pletzer et al., 2024). Yet, when applying this theoretical framework to their own research, researchers have encountered various theoretical, methodological, and practical issues. We hope that by addressing these issues, this article will contribute to a better understanding of JD–R theory.

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