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Job Demands–Resources Theory: Ten Years Later

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Abstract

Burnout refers to a work-related state of exhaustion and a sense of cynicism. In contrast, work engagement is a positive motivational state of vigor, dedication, and absorption. In this article, we discuss the concepts of burnout and work engagement and review their antecedents and consequences. We look back at our inaugural Annual Reviews article (Bakker et al. 2014) and highlight new empirical findings and theoretical innovations in relationship to job demands–resources (JD-R) theory. We discuss four major innovations of the past decade, namely (*a*) the person × situation approach of JD-R, (*b*) multilevel JD-R theory, (*c*) new proactive approaches in JD-R theory, and (*d*) the work–home resources model. After discussing practical implications, we elaborate on more opportunities for future research, including JD-R interventions, team-level approaches, and demands and resources from other life domains.

INTRODUCTION

It has been almost 10 years since we published our article for the inaugural volume of the *Annual Review of Organizational Psychology and Organizational Behavior* (Bakker et al. 2014). At the time, we had no idea that this Annual Reviews journal would obtain such a high impact factor and that our article would become one of the most cited of this journal. The popularity of the article indicates that many colleagues are actively trying to understand, explain, and influence burnout and work engagement and that job demands–resources (JD-R) theory offers valuable knowledge and means for doing so. Over the past decade, our field has made substantial progress, and we have gained new insights into the possible causes and consequences of burnout and work engagement. This article celebrates the tenth anniversary of the *Annual Review of Organizational Psychology and Organizational Behavior* and highlights the progress we have made. We hope you will find this an engaging read.

The Concept of Burnout

Freudenberger (1974) coined the term burnout and defined it as "a state of mental and physical exhaustion caused by one's professional life." Among the volunteers who worked for aid organizations, he observed an "extinction of motivation or incentive, especially where one's devotion to a cause or relationship fails to produce the desired results" (p. 159). In the decades that followed, empirical research was largely dominated by Maslach & Jackson's (1981) approach. These scholars defined burnout as a syndrome characterized by emotional exhaustion, depersonalization (i.e., a negative, excessively detached response toward the recipients of one's service or care), and lack of personal accomplishment (i.e., feelings of incompetence and lack of successful achievement at work) (see also Maslach & Leiter 2008).

Originally, scholars assumed that burnout was a response to chronic emotional and interpersonal stressors at work (Maslach et al. 2001). This view was revised in the 1990s, when Schaufeli and colleagues (1996) replaced the depersonalization component with cynicism (i.e., a distant attitude toward work in general, and not necessarily toward other people) and Demerouti & Nachreiner (1998) defined burnout as a syndrome of chronic fatigue or exhaustion and disengagement from work. Later approaches included physical fatigue and cognitive weariness (Shirom & Melamed 2006) or cognitive impairment (Schaufeli et al. 2020) as core symptoms of burnout.

In approximately 2015, the prevalence of burnout was 10% among workers in European countries and 17% among workers in non-European countries (Schaufeli 2018). In the United States, 28% of millennials felt frequently or constantly burned out, compared to 21% of all workers belonging to older generations (Pendell 2018). Only recently has burnout been recognized as an "occupational phenomenon" by the World Health Organization (WHO) in the International Categorization of Diseases (ICD-11) (WHO 2019). Notably, burnout is not classified as a medical condition. Rather, the WHO definition follows the three-dimensional conceptualization of Maslach et al. (2001). This is an important step forward but also raises important theoretical and practical questions, given the ongoing debate about the conceptualization and definition of burnout. Between 1974 and 2019, no fewer than 13 different definitions of burnout were published (Canu et al. 2021).

The academic debate on what constitutes burnout has uncovered at least two further issues (Demerouti et al. 2021a). First, the instruments used to measure burnout have not been developed for diagnostic purposes. Thus, differentiating between mild burnout symptoms (i.e., those potentially at risk) and clinical burnout is difficult. Second, the overlap between burnout and depression is very high; Bianchi et al. (2021) found a meta-analytic correlation of $r = 0.80$. This means that distinguishing between both concepts is difficult. According to Bakusic et al. (2017),

the concepts share a common biological basis (i.e., DNA methylation), and burnout as well as depression coincides with symptoms of energy loss and fatigue.

The Concept of Work Engagement

Kahn (1990) introduced the concept of engagement as the "...harnessing of organization member's selves to their work roles: in engagement, people employ and express themselves physically, cognitively, emotionally and mentally during role performances" (p. 694). Thus, engaged employees put much effort into their work because they identify with it. However, it is research on burnout that has stimulated most contemporary research on work engagement. In contrast to employees who suffer from burnout, engaged employees have a sense of energetic and affective connection with their work; they perceive their work as challenging. According to Maslach & Leiter (2008), work engagement, as the direct opposite of the three burnout dimensions, is characterized by energy (instead of exhaustion), involvement (instead of cynicism), and efficacy (instead of ineffectiveness). By implication, work engagement is assessed by the opposite pattern of scores on the three dimensions of burnout.

In contrast, Schaufeli et al. (2002) defined work engagement as "...a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (p. 74). Vigor refers to high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication implies being strongly involved in one's work and experiencing a sense of significance, enthusiasm, and challenge. Absorption refers to being fully concentrated and happily engrossed in one's work, whereby time passes quickly. Thus, work engagement is characterized by a high level of energy and strong identification with one's work, whereas burnout is characterized by the opposite: a low level of energy and poor identification with one's work (González-Romá et al. 2006).

In Europe, the prevalence of work engagement is relatively high. In 2015, most workers (71%) in 27 participating countries reported feeling full of energy or dedicated to their work, and 76% felt absorbed at work "always" or "most of the time" (Eurofound 2017). A recent meta-analysis suggests that work engagement has some overlap with workaholism. The absorption component of work engagement is positively related to the two main indicators of workaholism: working excessively and working compulsorily (Di Stefano & Gaudino 2019). Moreover, while job satisfaction reflects hedonic work-related well-being connoting pleasure but also satiation and calmness, work engagement reflects eudemonic work-related well-being connoting pleasure but also high activation—including enthusiasm, excitement, and energy (Tummers et al. 2018). Although there is a debate about whether burnout and work engagement may co-occur or be mutually exclusive (as each other's opposite), Maricuțoiu et al.'s (2017) meta-analysis showed nonsignificant cross-lagged relationships between burnout and work engagement.

Antecedents

In addition to theoretical and empirical work on the conceptualization of burnout and work engagement, research has focused on identifying situational and individual predictors. Which working conditions prevent burnout and foster work engagement? Why are some individuals more prone to burnout or engagement than others? We answer these questions in the following sections.

Antecedents of burnout. Research has shown that situational as well as individual factors contribute to burnout. What do we know about the antecedents of burnout?

Situational factors. Meta-analyses and systematic reviews conducted over the last 25 years have shown that there are specific contextual factors leading to burnout. Lee & Ashforth's (1996)

meta-analysis showed that exposure to job demands such as role ambiguity, role conflict, role stress, stressful events, workload, and work pressure led to exhaustion and depersonalization. Given that this study was conducted among human services providers, Alarcon (2011) extended the meta-analysis to all types of occupations and confirmed that job demands were important predictors of burnout for individuals working in various sectors. It seems clear that sustained physical, emotional, or cognitive effort has psychological and physiological costs. In these studies, job resources were less strongly related to burnout and showed a consistent negative relationship—particularly with the cynicism component (see Demerouti et al. 2001).

Aronsson et al. (2017) built on previous meta-analyses and included longitudinal studies in their analysis. They found that most of the studies were focused on emotional exhaustion, with fewer on cynicism and still fewer on personal accomplishment. Regarding the main situational factors predicting burnout, they found the strongest evidence for the relation between two job resources and burnout. Specifically, both job control and workplace support were negatively related to emotional exhaustion. They also found that job demands such as workload and job insecurity increased the risk for developing exhaustion, although the evidence was limited. The empirical evidence was judged insufficient for a number of predictors, such as workplace conflicts, lack of feedback, long working week, and physical environment, as well as for the combination of high psychological demands and low decision latitude. Interestingly, reduced personal accomplishment was associated only with low rewards. Finally, Shoman et al. (2021) conducted a systematic review of longitudinal studies conducted between 1990 and 2018. The results supported the notion that continued exposure to various job demands leads to exhaustion.

Individual factors. Since individuals differ in the way they appraise and cope with their environment (Lazarus & Folkman 1984), the experience of burnout may be different among employees facing the same working conditions. Swider & Zimmerman (2010) argued that neurotic employees would be more prone to experience burnout because they tend to focus on the negative aspects of a situation and often recall negative information about a situation afterward. In contrast, extraverted, agreeable, and conscientious employees would be less prone to experience burnout because they tend to be open, warm, supportive, and perseverant—characteristics that help one cope with job demands. The results of their meta-analysis supported this argumentation, showing that personality factors were robust predictors of burnout. These findings are in line with Alarcon et al. (2009), who found in a meta-analysis that emotional stability was the most important predictor of exhaustion and depersonalization, whereas extraversion was the most important predictor of personal accomplishment.

Over the last few years, scholars have shown an increased interest in examining individual factors. Among mental health professionals, emotional intelligence and emotional stability negatively relate to burnout (e.g., Gutierrez & Mullen 2016). In a review of correlates of faculty burnout, Sabagh et al. (2018) identified hardiness, coping abilities, and intrinsic motivation as protective factors. Among educational staff, burnout has been linked to the affective insecurity and impulsiveness components of borderline personality (Bianchi et al. 2018).

Antecedents of engagement. The concept of work engagement includes enthusiasm about the content of work and excitement regarding the tasks one performs. It therefore seems evident that situational factors can have an important influence on engagement. What is the role of the individual? What do we know about the antecedents of work engagement?

Situational factors. Job resources are aspects of the job that can help one achieve work goals, regulate job demands, and/or stimulate personal growth (Bakker & Demerouti 2017). In meta-analyses, Christian et al. (2011) and Halbesleben (2010) identified important job resources,

including autonomy, social support, feedback, and task significance, as predictors of engagement. In both studies, the relationship of job resources with work engagement was much stronger than the relationship of job demands with work engagement.

Lesener et al. (2020) identified 55 longitudinal studies (including 57 samples) examining the impact of various job resources on work engagement. The authors classified resources into three categories: group-level resources, leader-level resources, and organizational-level resources. They found links between job resources and work engagement at all three levels. Autonomy/job control was the most studied resource at the organizational level, while social support and supervisory support were the most frequently analyzed resources at the group and leader levels, respectively. Among the three levels, organizational resources had the strongest impact on work engagement over time. Lesener and colleagues argued that organizational resources reflect how the work is organized, designed, and managed and therefore are more directly connected to the employee than are resources at the other two levels.

Mazzetti et al. (2021) systematically investigated documents published between 2011 and 2018, including a total of 94 studies. They evaluated four types of resources: social resources (e.g., coworker support), job resources (e.g., task variety), organizational resources (e.g., organizational justice), and developmental resources (e.g., career perspective). In line with the abovementioned meta-analyses, all types of job resources were positively related to work engagement. Among the four categories, development resources had a stronger relationship with work engagement than did organizational, job, and social resources, with coworker support as the weakest predictor of work engagement.

Individual factors. The role of individual characteristics in the work engagement process is clear and has been consistently shown in different meta-analyses. Halbesleben (2010) showed that optimism and self-efficacy predicted work engagement, whereas Christian et al. (2011) also mentioned conscientiousness, positive affect, and proactive personality. Mäkikangas et al. (2013) added self-efficacy, optimism, and self-esteem (i.e., personal resources in JD-R theory) and confirmed their positive relationship with work engagement.

Since then, scholars have continued showing interest in the role that the Big Five personality factors (conscientiousness, neuroticism, extraversion, agreeableness, and openness to experience) and other individual characteristics play in work engagement. Young et al. (2018) showed that the Big Five, as well as proactive personality and positive affectivity, related to work engagement. Mazzetti et al. (2021) included personal resources (i.e., resilience, self-efficacy, optimism, and proactivity) in their meta-analysis and found that their influence on work engagement was statistically stronger than social and job resources. Emotional intelligence was also identified as a predictor of work engagement (Akhtar et al. 2015). When individuals are able to recognize and manage their own and others' emotions, they collect more emotional resources during interactions with others. These emotional resources, in turn, facilitate work engagement. Openness to experience, interpersonal sensitivity, extraversion, adjustment, and conscientiousness also predicted engagement.

Consequences

As discussed below, burnout and work engagement are parts of two different processes with different associated outcomes (Bakker & Demerouti 2017). While burnout leads to ill-health and unfavorable organizational outcomes, work engagement is part of a motivational process leading to favorable organizational outcomes. In the following sections, we disentangle these outcomes, dividing them into different categories.

Consequences of burnout. Since chronic fatigue is a core element of burnout, it can be argued that burned-out individuals have reduced levels of energy and can only invest limited effort in their work. Indeed, research has shown that burnout is linked to health problems as well as job-related outcomes.

Health-related outcomes. There is wide empirical evidence showing that the experience of burnout leads to several health-related issues. Such evidence generally causes alarm because these effects are not momentary and do not fade out quickly. For example, Kim et al. (2011) found that social workers who scored high on burnout reported problems falling asleep, headaches, and respiratory and gastrointestinal infections 3 years later. Burnout also predicts diabetes and the common cold (e.g., Melamed et al. 2006). The most alarming finding was reported by Ahola et al. (2010), who followed more than 7,000 workers over a 10-year period. They found that burnout contributed to mortality among employees under 45 years of age. The mechanism linking burnout to mortality needs to be explored, but on the basis of previous empirical evidence, the authors argued that cardiovascular disease, changes in stress hormones, or impairment of the immune system could be important mechanisms.

Yang & Hayes (2020) conducted a systematic review of 44 studies conducted between 2009 and 2020. They concluded that psychotherapists suffering from burnout are at risk of developing a wide range of health-related problems, including anxiety and depressive disorders, secondary traumatic stress, back and neck pain, sleep deprivation, and insomnia. Patel et al. (2018) conducted a review of studies published between 2000 and 2018 to summarize the main consequences of burnout among physicians. They highlight important consequences for physicians' health, ranging from mood disorders and increased alcohol abuse/dependence to a suicide rate 2.27 times higher than the general population among female physicians and 1.41 times higher than the general population among male physicians. With the outbreak of coronavirus disease 2019 (COVID-19), we also find studies showing the negative effects of burnout among healthcare workers. For example, among Italian healthcare employees during the first pandemic peak period, Conti et al. (2021) found that participants with burnout had significant higher levels of depression, anxiety, post-traumatic symptomatology, intrusive thoughts, and hyperarousal than did participants without burnout.

Job-related outcomes. The experience of burnout has consequences at the occupational level, which can ultimately impact the organization. Surprisingly, Lee & Ashforth's (1996) classic meta-analysis on job burnout did not include important work outcomes such as absenteeism, personnel turnover, and job performance. This gap was filled by the meta-analysis of Swider & Zimmerman (2010). They found an interesting pattern of results, with emotional exhaustion as the most proximal predictor of absenteeism, depersonalization the most proximal predictor of turnover, and personal accomplishment the most proximal predictor of job performance. This last aspect has usually been the most controversial one because most studies use self-report measures of performance, which involves the issue of common method variance bias. However, in the meta-analysis, Swider & Zimmerman (2010) included other ratings of performance and found that the relationship between job burnout and job performance was actually stronger when other ratings were used. Long-term sickness (90 days or more) is also an outcome that deserves attention. In a study among 6,000 employees in Sweden, Peterson et al. (2011) found that the exhaustion dimension predicted long-term sick leave (≥90 days) during a follow-up of 44 months.

Consequences of burnout have been of particular concern in the healthcare sector because of the implications for patient care. In a systematic review, Patel et al. (2018) pointed out that physicians' burnout leads to important outcomes such as increased risk of malpractice, increased

number of medical errors, and reduced patient satisfaction. Jun et al. (2021) conducted a systematic review of 20 studies to investigate the relationship between (*a*) nurse burnout and (*b*) patient and organizational outcomes. The emotional exhaustion dimension of burnout was negatively associated with nurses' perceived patient safety and patients' satisfaction with received care. Depersonalization was associated with increased nurse-reported falls and medication errors. One of the studies included in this review showed that nurse burnout was positively related to surgical site infections even when patient severity and nurse and hospital characteristics were controlled for (Cimiotti et al. 2012).

Consequences of engagement. When individuals are engaged in their work, they are full with energy and enthusiasm. Such active positive emotions help to take initiative and persist when working on difficult work tasks. What are the motivational and job-related outcomes of work engagement?

Motivational outcomes. Engaged workers seem more open to new experiences (Fredrickson 2001). As a result, they tend to explore their environment and be more creative. Indeed, in a study among Dutch employees, Bakker et al. (2020b) showed that weekly work engagement was positively related to weekly creativity; this relationship was stronger when individuals had a high (versus low) learning goal orientation. Asif et al. (2019) found that ethical leadership was related to higher affective commitment, which in turn increased work engagement and, ultimately, creativity. On the basis of social exchange theory, Hui et al. (2020) conducted a study among Chinese millennial generation employees, showing that those who identified with their organization were more engaged in their work and, as a result, showed greater creativity. A related outcome, namely innovative behavior, is also a positive consequence of experiencing positive affect and work engagement (Kong & Li 2018). These findings suggest that work engagement has the potential to broaden employees' horizons, making them more prone to explore alternative and innovative paths.

The positive effects of work engagement go beyond the employee. Rodríguez-Muñoz et al. (2014) found that employees and their intimate partners at home were happier on the days on which employees experienced higher work engagement. In a study among Japanese families, Shimazu et al. (2020) found that work engagement was positively related to work-to-family facilitation and own happiness. When fathers and mothers reported higher levels of happiness, their child had less emotional and behavioral problems.

Job-related outcomes. One crucial outcome of work engagement is job performance. Kim et al. (2013) reviewed 20 papers exploring this link and found that 11 studies found a direct or indirect relationship between work engagement and job performance. Seven other studies found that work engagement was the mediating factor between other constructs and job performance; two studies indicated a relationship mediated by another factor (e.g., job embeddedness). Notably, only one study in this review used objective financial data to measure performance (Xanthopoulou et al. 2009b).

Neuber et al.'s (2022) meta-analysis confirmed the positive association between work engagement and task performance. The three facets of engagement had similar effects on performance over time. As Kim et al. (2019) state, work engagement is not just "nice to have"; it fully mediates the influences of environmental and personal resources on employee performance. Christian et al. (2011) pointed out that work engagement is important not only for task performance but also for extrarole performance. Engaged employees are more prone to help others because they are able to free up resources and have energy to perform their tasks efficiently. For example, Farid et al. (2019), in a study among employees working in the banking sector, found a positive relationship between work engagement and organizational citizenship behaviors.

But there are other job-related outcomes beyond performance, as demonstrated in the meta-analysis by Mazzetti et al. (2021). Interestingly, the highest correlations were found between work engagement and two outcomes: job commitment and job satisfaction. In this analysis, the relationship between work engagement and performance was moderate to high. Finally, Keyko et al. (2016) conducted a systematic review of studies among nurses and found that work engagement was positively related to perceived quality of care, patient satisfaction, and work effectiveness.

JD-R THEORY

JD-R theory is a unifying job design theory that integrates various job stress and motivational perspectives (Bakker & Demerouti 2017, Van Veldhoven et al. 2020). In short, the theory explains how job demands and resources influence job performance through employee well-being (including burnout and work engagement) and how employees use proactive as well as reactive work behaviors to influence job demands and resources (Bakker & Demerouti 2017, Bakker et al. 2014). While originating from the burnout and engagement literatures (Demerouti et al. 2001), JD-R theory over the past two decades has been able to synthesize knowledge from various theories of job stress and work motivation, including two-factor theory (Herzberg 1966), job characteristics theory (Hackman & Oldham 1976), the job demands–control model (Karasek 1979), the effort–reward imbalance model (Siegrist 1996), and conservation of resources theory (Hobfoll et al. 2018). In doing so, it provides for a more complete and comprehensive understanding of employee well-being and performance.

Whereas previous job design models have claimed a limited and fixed set of job characteristics as crucial predictors of job stress and/or work motivation, JD-R theory is flexible and able to integrate a wide variety of job characteristics. A core assumption of all job design theories is that certain physical, social, or psychological facets of the job and the organizational environment influence employee well-being and may indirectly affect employee health, behavior, and performance. For example, the job demands–control model (Karasek 1979) proposes that job demands are particularly stressful and may lead to health problems when job control is low. Job characteristics theory (Hackman & Oldham 1976) proposes that five specific job characteristics (skill variety, task identity, task significance, autonomy, and feedback) have a positive impact on work outcomes (motivation, performance) through critical psychological states (experienced meaningfulness, experienced responsibility for outcomes, and knowledge of actual results).

JD-R theory synthesizes these perspectives and claims that burnout and work engagement may be the result of various job characteristics (for an overview of all propositions, see **Table 1**). Although all organizations are unique and their jobs may have different characteristics, the first proposition of JD-R theory is that all these job characteristics can be modeled using two distinctive categories, namely job demands and job resources (Demerouti et al. 2001). Job demands are defined as the physical, psychological, social, or organizational aspects of the job that require sustained physical, cognitive, and/or emotional effort and are therefore associated with certain physiological and/or psychological costs (Demerouti et al. 2001). In contrast, job resources are defined as the physical, psychological, social, or organizational aspects of the job that have motivating potential, that are functional in achieving work goals, that regulate the impact of job demands, and that stimulate learning and personal growth (Bakker & Demerouti 2017). While some job demands and resources (e.g., workload, social support) can be found in almost every occupational group, other job demands and resources are more unique. For example, while emotional and physical demands are very important job demands for nurses and police officers, cognitive demands are much more relevant for software developers and scientists.

A second proposition of JD-R theory is that job demands and resources instigate two different processes (see **Figure 1**). In the first process, the health impairment process, the frequency and/or

Table 1 Propositions in job demands–resources theory

| Proposition	Definitions, specifications and hypotheses
Proposition 1: Job characteristics can be modeled using two distinctive categories, namely job demands and job resources.	Job demands are defined as the physical, psychological, social, or organizational aspects of the job that require sustained physical, cognitive, and/or emotional effort and are therefore associated with certain physiological and/or psychological costs. Job resources are defined as the physical, psychological, social, or organizational aspects of the job that have motivating potential, that are functional in achieving work goals, that regulate the impact of job demands, and that stimulate learning and personal growth.
Proposition 2: Job demands and resources instigate two different processes.	Health impairment process: The frequency and/or severity of job demands leads to increased effort, which, in turn, depletes employees' physical, emotional, and cognitive resources and may lead to exhaustion and health problems. Motivational process: Job resources satisfy basic psychological needs and foster employee work engagement. The experience of work engagement consequently leads to creativity and improved performance.
Proposition 3: Job demands and resources have a multiplicative impact on employee well-being.	Buffer hypothesis: Job resources weaken the impact of job demands on strain. Boost hypothesis: Job demands amplify the impact of job resources on work engagement (and more generally on work motivation).
Proposition 4: Personal resources such as optimism, self-efficacy, and resilience have a reciprocal relationship with job resources.	Personal resources are positive self-evaluations that refer to individuals' sense of their ability to control and impact their environment successfully. Employees with more personal resources are expected to also have access to more job resources, and vice versa.
Proposition 5: Similar to job resources, personal resources moderate the impact of job demands on employee well-being.	When employees perceive that they can control their work environment, they are better able to deal with job demands.
Proposition 6: Employees proactively optimize their own job demands and resources via job crafting.	Job crafting refers to 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 is expected to increase job and personal resources and facilitate work engagement and performance.
Proposition 7: Work engagement can instigate a gain cycle of proactive work behaviors, (job and personal) resources, and optimal job demands.	Engaged employees are intrinsically motivated to stay engaged and therefore start to proactively optimize their job (increase resources and optimize demands). Over time, this job crafting behavior generates job and personal resources that help employees to deal with job demands and fosters future work engagement.
Proposition 8: Job demands and strain may lead to maladaptive self-regulation cognitions and behaviors (self-undermining).	Self-undermining refers to employees' dysfunctional behaviors (e.g., poor communication, conflict behaviors) that create obstacles and may undermine performance. Self-undermining is expected to increase hindrance job demands and lead to strain and poor performance.
Proposition 9: Job strain can instigate a loss cycle of self-undermining and job demands.	When employees experience higher levels of job strain, concentrating is more difficult, and they make more work-related mistakes. Over time, self-undermining behaviors generate new job demands that foster future job strain.
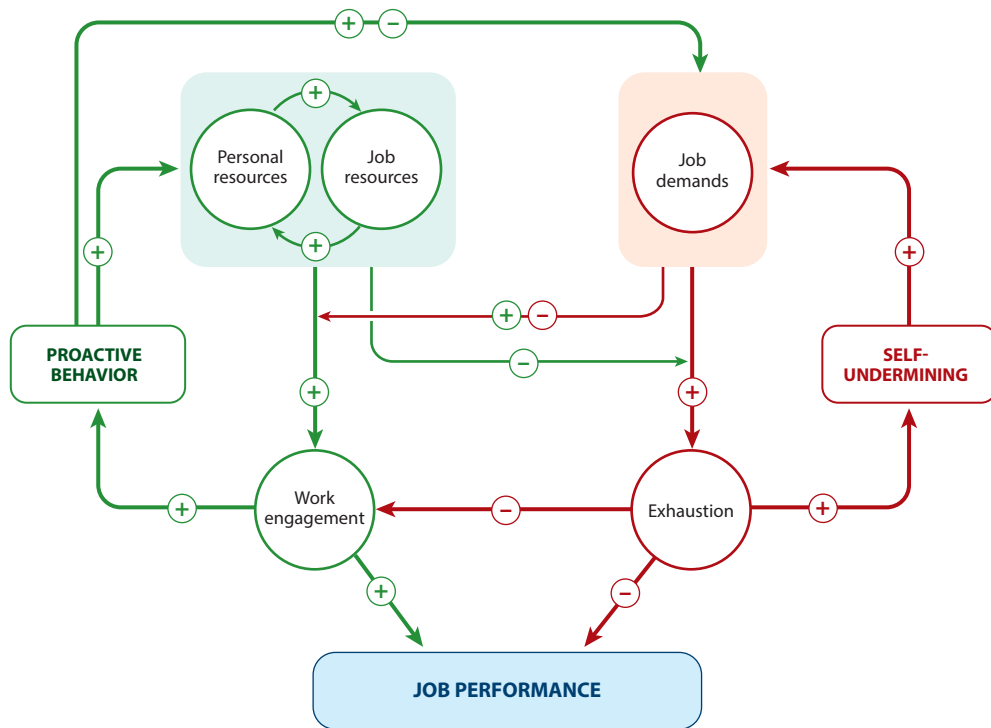
Figure 1

The job demands–resources model. Data from Bakker & Demerouti (2017).

severity of job demands (e.g., workload, email demands, interpersonal conflicts) leads to increased effort. This increased effort depletes employees' physical, emotional, and cognitive resources and may lead to job strain, exhaustion, and health problems (e.g., Demerouti et al. 2001, Li et al. 2022). In the second process, the motivational process, job resources (e.g., skill variety, social support, feedback) satisfy basic psychological needs and foster employee work engagement. The experience of work engagement consequently leads to creativity and improved performance (e.g., Bakker & Xanthopoulou 2013).

There is considerable evidence for health impairment and motivational pathways in JD-R theory (for meta-analyses, see Alarcon 2011, Christian et al. 2011, Crawford et al. 2010, Halbesleben 2010). Nahrgang et al. (2011) conducted a meta-analysis based on 203 independent samples ($N = 186,440$). These authors related job demands and resources to safety outcomes through burnout and work engagement and found support for JD-R theory in the context of safety at work. Job demands (risks and hazards) were particularly related to burnout and, in turn, to highly adverse events such as errors at work, whereas job resources (safety climate) were particularly related to work engagement (in terms of compliance with safety and preventative measures), which, in turn, predicted lower accidents and injuries. In a meta-analysis of longitudinal JD-R studies, Lesener et al. (2020) used structural equation modeling on the data of 57 independent samples ($N = 37,324$). They found that job demands were uniquely related to burnout over time, whereas job resources were most strongly positively related to work engagement (but also negatively related to burnout) over time.

The third proposition is that job demands and resources have a multiplicative impact on employee well-being (including burnout and work engagement). First, according to the buffer

hypothesis in JD-R theory, job resources weaken or buffer the impact of job demands on strain. Job resources may alter the perceptions and cognitions evoked by job demands, may moderate responses that follow the appraisal process, or may reduce the health-damaging consequences of such responses (Bakker et al. 2005). Indeed, several studies have shown that job resources such as skill variety, performance feedback, and opportunities for recovery can mitigate the impact of various job demands (e.g., workload, cognitive demands, emotional demands) on strain, including psychological distress, burnout, and psychosomatic complaints (e.g., Bakker et al. 2005, De Jonge & Huter 2021, Lavoie-Tremblay et al. 2014).

Second, according to the boost hypothesis in JD-R theory, job demands amplify the impact of job resources on work engagement (and more generally on work motivation; see **Figure 1**). Particularly when employees are regularly confronted with challenge job demands (e.g., work complexity, workload), they can benefit from training, autonomy, and feedback—and utilize social job resources such as support from colleagues and intellectual stimulation from the leader to cope with these challenges (Bakker et al. 2007, Breevaart & Bakker 2018). Hobfoll and colleagues (2018) have argued that individuals must bring in resources to prevent resource loss and that those with a greater pool of resources are less susceptible to resource loss. Indeed, consistent with this idea and with JD-R theory, Tadic et al. (2015) found that daily hindrance job demands such as bureaucracy, role conflict, and hassles had a weaker negative effect on work engagement on days on which employees had access to job resources like social support, coaching, and feedback. In short, job resources become salient and are most important for burnout and 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 their environment successfully (Hobfoll et al. 2003). Proposition 4 in JD-R theory states that personal resources such as optimism, self-efficacy, and resilience have a reciprocal relationship with job resources. This means that employees with more personal resources are expected to also have access to more job resources, and vice versa. Indeed, using a longitudinal design, Xanthopoulou et al. (2009a) found that employees who were more self-efficacious and optimistic also reported higher levels of autonomy, performance feedback, and opportunities for growth over time. In addition, job resources had a lagged positive effect on personal resources. Similar to job resources, personal resources can also moderate the impact of job demands on employee well-being (Proposition 5; see **Figure 1**). When employees perceive that they can control their work environment, they are better able to deal with job demands. For example, using a weekly diary study among nurses, Bakker & Sanz-Vergel (2013) predicted and found that challenging emotional job demands were positively related to work engagement when self-efficacy and optimism were high. However, emotional job demands were negatively related to work engagement when these personal resources were low.

JD-R theory proposes that job demands and resources influence employee well-being, behaviors, and performance but that employees may also proactively optimize their own job demands and resources (Proposition 6). This process of employees shaping their jobs has been referred to as job crafting (Wrzesniewski & Dutton 2001). Tims & Bakker (2010) discussed that employees can engage in various types of proactive behavior, including role innovation, task revision, and negotiation of individualized arrangements with their employer. They defined job crafting as employees' personal initiative to change their job demands and job resources to better align the design of the job with their own abilities and preferences.

Job crafting is a bottom-up approach to job redesign that is expected to optimize job characteristics, increase person–job fit, and increase work engagement (Tims et al. 2013; see **Figure 1**). Indeed, 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 work engagement and performance increase (e.g., Petrou et al. 2015). Moreover, a meta-analysis of job crafting training intervention studies (Oprea et al. 2019) showed that employees can learn to use job crafting strategies by setting clear job crafting goals. Over time, implementing these goals leads to a better job design, more meaningful work, lower burnout, higher work engagement, and improved performance.

Further inspection of **Figure 1** shows that work engagement is both an outcome and a predictor of proactive behavior (including job crafting) and job and personal resources. Thus, taking chronological time into consideration, JD-R theory proposes that employees may enter a gain cycle (Proposition 7). Specifically, when employees experience vigor, dedication, and absorption (i.e., work engagement), they are intrinsically motivated to stay engaged and therefore start to proactively optimize their job (increase resources and optimize demands). Over time (i.e., days, weeks, months, years), this job crafting behavior, in turn, generates job and personal resources that help employees to deal with job demands and foster work engagement. A positive gain cycle may even result in a gain spiral, in which the positive relationships (loops) between work engagement, proactive behavior, and resources become increasingly stronger and the levels of these variables become increasingly higher (see also Hobfoll et al. 2018, Salanova et al. 2010).

Whereas job resources and work engagement may stimulate employees to use proactive behaviors, JD-R theory proposes that job demands and strain may lead to maladaptive self-regulation cognitions and behaviors (Proposition 8) (Bakker & De Vries 2021). When employees experience higher levels of job strain, they find concentrating more difficult and make more mistakes (Van der Linden et al. 2005). In addition, the negative emotions (e.g., anger, irritation) experienced by employees under stress narrow their thought–action repertoires (Fredrickson 2001). Thus, when job demands are persistently high, employees may start to use destructive strategies like self-undermining; i.e., they create new obstacles that may compromise their job performance (Bakker & Costa 2014, Bakker & Wang 2020). Examples are communicating poorly, making careless mistakes, and starting interpersonal conflicts. Using a diary study, Roczniewska & Bakker (2021) found that nurses with lower self-regulation capacity at the beginning of the day were more likely to show self-undermining during the day, which impaired daily job performance.

As **Figure 1** shows, job strain is both an outcome and a predictor of dysfunctional behaviors (including self-undermining) and job demands. Thus, over the course of time, employees may enter a loss cycle (Proposition 9). Specifically, when employees experience job strain in the form of exhaustion, anxiety, or depressive complaints, they deplete their energy resources and engage in dysfunctional coping. Over time (i.e., days, weeks, months, years), this self-undermining behavior, in turn, generates additional job demands and further increases job strain. If this process becomes chronic, the negative loss cycle may result in a loss spiral (see also Hobfoll et al. 2018), in which the positive relationships (loops) between job strain, self-undermining, and demands become increasingly stronger and the levels of these variables become increasingly higher. Indicative of this loss cycle is the study by Bakker et al. (2023). Using a weekly diary design, they showed that weekly job demands were related to weekly self-undermining behaviors through weekly burnout symptoms (exhaustion and cynicism). The impact of weekly job demands on burnout symptoms and self-undermining was stronger for individuals who were already relatively high (versus low) on chronic burnout.

TEN YEARS LATER

The previous section highlights several innovations in JD-R theory, including feedback loops, growing evidence for the importance of job crafting, and (to a lesser extent) evidence for the role of self-undermining. However, various other developments in JD-R theory are exciting and

important. Here, we discuss four major innovations of the past decade, namely (*a*) the person $\times$ situation approach of JD-R, (*b*) multilevel JD-R theory, (*c*) new proactive approaches in JD-R theory, and (*d*) the work–home resources model. We also pay attention to common problems in JD-R research.

Person × Situation Approach

Over the years, several scholars have tried to incorporate personality into JD-R theory. As we discuss above, these studies have suggested that the Big Five personality factors influence the perception and evaluation of job demands and resources and may have direct and indirect effects on employee well-being (e.g., Borst & Knies 2021, Mäkikangas et al. 2013). However, whereas personality is stable, work events and job characteristics (e.g., workload, social support) may fluctuate—even from day to day. This calls for a person $\times$ situation approach in which the stability of the person and the variability of the situation are included in one overall model (see **Figure 2**).

According to Bakker (2015), personality is a higher-order construct that differs between individuals, whereas job demands, job resources, and personal resources differ within individuals. As in the original JD-R theory, job demands are hypothesized to evoke exhaustion and self-undermining, which may consequently result in more job demands—but now from day to day. In contrast, job and personal resources are hypothesized to evoke work engagement and proactive work behaviors, which subsequently result in even more job and personal resources—on a daily basis. What is different from the original version of JD-R theory is that personality is proposed to moderate the daily effects of job demands and resources on well-being and outcomes. Thus, it can be expected that neurotic individuals will suffer most on the days on which they are exposed to a high workload and complex tasks (e.g., Debusscher et al. 2016), because they lack the skills
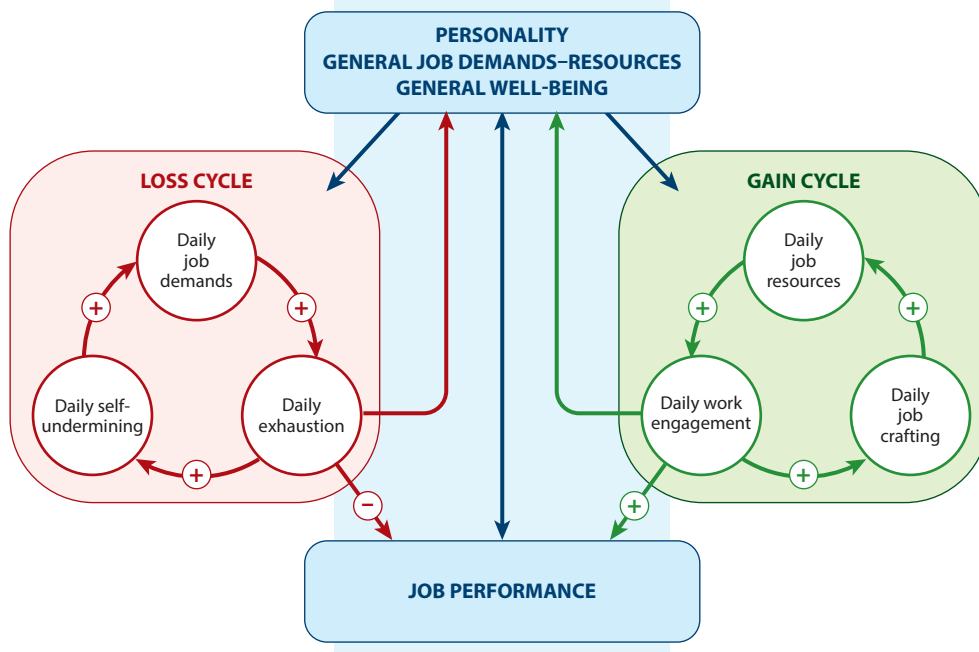

Figure 2

The person × situation approach of the job demands–resources model.

needed to deal with such demands. In addition, extraverted individuals may flourish most on the days on which they have access to many social job resources, because they have the strongest need for relatedness and social exchange (Bakker 2022).

An important proposition of the multilevel version of JD-R theory (Bakker 2015; see **Figure 2**) is the idea that relatively stable or chronic levels of well-being or ill-being may also influence how employees deal with job demands and resources. General ill-being is hypothesized to moderate the impact of daily job demands on exhaustion and self-undermining such that the effects are more strongly positive when ill-being (e.g., chronic burnout, depression, physical disease) is higher (Bakker et al. 2023, Meier et al. 2014, Roczniewska & Bakker 2021). In a similar vein, general well-being is hypothesized to moderate the impact of daily job resources on work engagement and job crafting such that the effects are more strongly positive when well-being (e.g., overall work engagement, overall vitality) is higher (Bakker & Oerlemans 2016). JD-R theory also proposes that ill-being may prevent employees from profiting from their daily job resources and that well-being may help employees to deal with their daily job demands (Bakker 2015).

Multilevel JD-R Theory

Whereas the person × situation approach shows that working days are nested in employees, the multilevel approach of JD-R acknowledges that employees are nested in teams, which, in turn, are nested in organizations. At the highest organizational level, we see how top management determines the strategic role of human resources and the organizational climate (see **Figure 3**; see Bakker & Demerouti 2018). Through human resources practices, organizations can select and develop their leaders, who influence their teams' job demands and resources and indirectly impact employee well-being and performance (Albrecht et al. 2015, Tummers & Bakker 2021). For example, Croon et al. (2015) showed that job enrichment human resources practices were indirectly related to productivity through employee perceptions of job resources and job
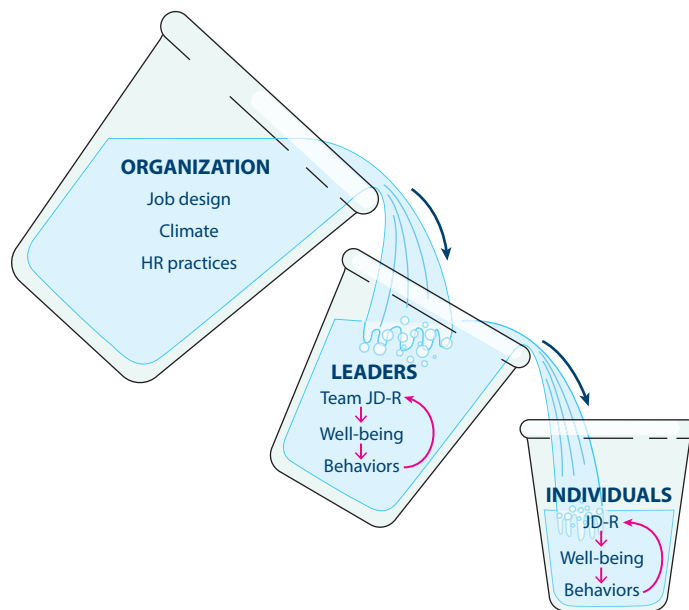

Figure 3

Multiple levels in JD-R theory. Abbreviations: HR, human resources; JD-R, job demands–resources.

satisfaction. Psychosocial safety climate may have similar trickle-down effects on employees. Dollard & Bakker (2010) found that, when employees perceived a psychosocial safety climate signaling that management took care of them, employees reported a richer combination of job demands and resources, resulting in higher levels of work engagement. In a similar fashion, Idris et al. (2014) found that psychosocial safety climate had positive cross-level effects on employee perceptions of job design and indirectly reduced job strain (exhaustion and depression).

In addition, there is considerable evidence for trickle-down effects of leaders on employees. Consistent with JD-R theory, Fernet et al. (2015) found that transformational leadership resulted in fewer job demands and more job resources and indirectly contributed to more positive work attitudes and better job performance. Wang et al. (2023) showed that proactive leaders who empowered their followers (through consulting, delegating, enabling, and informing) stimulated follower job crafting. Thus, followers were encouraged to proactively seek job challenges and resources so as to optimize their person–job fit and increase their own work engagement (Tims & Bakker 2010). Leaders may also function as key job resources themselves. By using charisma tactics, individual consideration, and intellectual stimulation, leaders help employees deal with their hindrance and challenge job demands (Breevaart & Bakker 2018).

In the original formulation of JD-R theory, Demerouti et al. (2001) argued and showed that job demands and resources are not merely subjective interpretations of employees, but rather characteristics of jobs that can be reliably observed by independent raters. Although the evidence base is still limited, several studies have shown that individuals who work in teams share their perceptions of job demands and resources; there is consensus regarding job characteristics at the team level. Employees who work in teams share the same leader and work environment. Moreover, because of having interdependence and frequent interactions, team members may also influence each other's affect, cognitions, and behaviors through modeling and emotional contagion (Bakker 2022).

For example, Costa et al. (2015) found that social support from coworkers, performance feedback, support from the supervisor, and information acted as team job resources that influenced objective research output (e.g., number of publications, oral presentations, and patents) through team work engagement. Relationship conflict weakened the link between team resources and team work engagement, whereas task conflict strengthened the link between team work engagement and performance. Li et al. (2022) used multisource and lagged data from more than 2,000 employees in almost 100 jobs and showed that objective job characteristics at the occupation level were indirectly related to employee outcomes through employees' perceptions of job demands and resources. Finally, Tims et al. (2013) hypothesized and showed that employees were more likely to be proactive and to improve their own job demands and resources if they worked in teams in which most others engaged in such job crafting behaviors. Team job crafting was related to team performance through team work engagement and to individual performance through individual job crafting and individual work engagement.

New Proactive Approaches

According to Hobfoll et al. (2018), individuals are evolutionarily wired to actively obtain and retain various resources to deal with current and future environmental demands. Consistent with this idea, JD-R theory proposes that employees are proactively motivated to acquire resources to deal with their job demands. Proactive work behavior refers to "self-initiated, anticipatory action aimed at changing either the situation or oneself" (Bindl & Parker 2011, p. 567). In recent years, JD-R theory has proposed several proactive work behaviors, including job crafting, proactive vitality management, and playful work design (e.g., Bakker 2017).

Job crafting. Job crafting is the first proactive behavior included in JD-R theory (Tims & Bakker 2010). The past decade has seen a plethora of job crafting studies that have generated important new insights. First, Demerouti & Peeters (2018) have argued and shown that, in addition to increasing job resources and job challenges, employees may optimize their job demands. These authors argued that proactively reducing job demands (e.g., reducing workload, avoiding annoying customers) costs more energy than it generates (e.g., Petrou et al. 2015, Rudolph et al. 2017). Instead, optimizing demands refers to proactive efforts to simplify work processes, work more efficiently, and bypass unproductive work processes. Optimizing demands has a positive relationship with work engagement (Demerouti & Peeters 2018) and job performance (Demerouti et al. 2018a), and intervention research has shown that it has a positive impact on willingness to change and safety behavior (Demerouti et al. 2021b).

A second important new insight is that employees who participate in training interventions can learn to strategically use job crafting (Oprea et al. 2019). In these interventions, employees learn to optimize their job demands and increase their challenges (Demerouti et al. 2021b). In addition, those who craft their jobs seem to increase their job and personal resources (e.g., Oprea et al. 2019, Vogt et al. 2016). Consequently, and consistent with JD-R theory (see **Figure 1**), job crafting increases meaningfulness, work engagement, and job performance (for a meta-analysis, see Rudolph et al. 2017).

Proactive vitality management. Whereas job crafting is aimed at changing the situation, proactive vitality management is aimed at changing the self. More specifically, proactive vitality management denotes a specific form of proactive behavior aimed at improving one's own physical and psychological resources to promote optimal functioning at work (Op den Kamp et al. 2018b). For example, employees may proactively look for energy, motivation, and inspiration by networking with people who have different ideas and viewpoints, by intentionally taking a walk in the nature, or by visiting a museum with the goal of finding new inspiration (Bakker et al. 2020b).

Op den Kamp et al. (2018a) found that employees were more creative in the weeks they proactively managed their own vitality. The effects were most pronounced for individuals who worked in organizations with considerable support for creative ideas and for individuals who were best able to recognize their own vitality (i.e., self-insight). In another study among employees from a variety of occupational sectors, Bakker et al. (2020b) found that weekly proactive vitality management was positively related to changes in weekly creativity through changes in weekly work engagement. The effects were strongest for individuals with a strong learning goal orientation—a desire to develop mastery through learning, seeking challenges, and acquiring new skills. Ye et al. (2022) found that Chinese employees who engaged in proactive vitality management reported fewer complaints of burnout (i.e., emotional exhaustion).

Playful work design. Playful work design is defined as the process through which employees proactively create conditions at work that foster play and enjoyment without changing the design of the job itself (Scharp et al. 2022b). When designing fun, employees use humor and fantasy to make work more enjoyable. An office worker may compare themselves with Charlie Chaplin in the time machine while working on emails. When designing competition, employees may intentionally try to make their work tasks more challenging. A retail security guard may, for example, try to guess which route a customer will follow after entering the store.

By playfully redesigning tasks so that they are more fun and more competitive, employees optimize the fit between their abilities and the task by making their work more challenging and more resourceful. Indeed, Scharp et al. (2022a) showed that, when employees designed their work to be more fun, they satisfied their basic need for relatedness. In addition, when employees designed their work to be more competitive, they satisfied their basic need for competence. Both types of

playful work design satisfied the basic need for autonomy. Furthermore, building on JD-R theory, Scharp et al. (2021) showed that, on the days on which employees redesigned their work tasks to be more fun, communion hindrance demands (social isolation, emotional demands, and interpersonal conflicts) did not result in reduced work engagement and impaired performance. In addition, on days on which employees redesigned their work tasks to be more competitive, agency hindrance demands (repetitive tasks, monotony, and simplicity) were no longer negatively related to work engagement and performance (see also Bakker et al. 2020a).

Work–Home Resources Model

Although work plays a central role in many people's lives, all of us have a life outside work in which we socialize, rest, love, play, and care for others. Since an increasing number of individuals combine work and nonwork roles, there has been a spectacular increase in the number of studies investigating how work and nonwork roles influence each other. In the work–home resources model, Ten Brummelhuis & Bakker (2012) integrate spillover theories with JD-R theory and propose that (*a*) job demands and resources may influence home outcomes through volatile personal resources (e.g., time, mood, energy) and (*b*) home demands and resources may simultaneously influence work outcomes through the same volatile personal resources. In addition, the authors propose that macro resources (e.g., culture, welfare) and key resources (e.g., personality, skills) moderate these spillover processes because macro and key resources influence how individuals deal with home and job demands and how individuals mobilize their home and job resources.

Over the past decade, the number of studies testing the WH-R model has steadily increased. For example, Aw et al. (2021) investigated spillover from work to home and found that offering help to colleagues at work both enriched and hindered family life. Specifically, they found that, when employees offered help and assistance to their colleagues, they felt a sense of personal accomplishment but also felt more tired (particularly when the provided help was not reciprocated). Consequently, exhaustion led to withdrawal behaviors at home and reduced family performance, whereas personal accomplishment led to fewer withdrawal behaviors at home and improved family performance. Du et al. (2020) argued and found that previous-day positive child-related events moderated the relationship between daily job demands and daily task performance through capitalization during the previous evening. The relationship between job demands and task performance was positive when employees had a resourceful home life—i.e., experienced a high (versus low) level of positive child-related events. In addition, sharing these positive events with significant others at home facilitated employees' functioning in dealing with job demands and further improved task performance during the subsequent workday.

Common Problems

Over the past two decades, many great studies, such as observational research in laboratory environments (e.g., Lee et al. 2020) and multilevel research that included almost 300,000 federal government employees (Jong & Ford 2016), have used and expanded JD-R theory. However, JD-R research is also plagued by common problems and misunderstandings, and there are examples of studies in which the theory is misused. **Table 2** summarizes several major issues. For example, scholars sometimes have difficulty distinguishing job demands from job resources. However, the absence of a job demand does not make work more motivating. Similarly, the absence of a job resource does not make work more demanding but rather inhibits voluntary initiation of action to achieve goals.

Other scholars have defined coping behaviors as personal resources. However, personal resources are positive beliefs or cognitions, which are not the same as behaviors. As a final example, some researchers assume that job demands always have negative outcomes, whereas job resources

Table 2 Common problems in job demands–resources research

	Job demands	Job resources	Personal resources	Employee behaviors	Example
Misconceptualization	A low score on a job resource is not a demand. Not all occupational sectors have the same demands	A low score on a job demand is not a resource	Personal resources are not job resources; they are aspects of the self	Behaviors are actions, not characteristics of the person or the job	Low support does not mean conflict. Lack of conflict is not support. Proactive coping is not task autonomy
Level of control	External: property of the work environment	External: property of the work environment	Internal: employees can choose to train themselves	Internal: visible actions employees may choose to engage in	Employees can use job crafting to increase job resources such as social support
Beneficial/detrimental	Hindrance demands: detrimental. Challenges: can be both	Can be both	Beneficial	Can be both	Time pressure (hindrance) is linked to ill-health. Cognitive demands (challenge) are linked to both work engagement and burnout. Resources: too much of a good thing?
Level of analysis	Can be analyzed at multiple levels	Can be analyzed at multiple levels	Can be analyzed at multiple levels	Can be analyzed at multiple levels	Personal resources can fluctuate. Personality is a trait
Outcomes (beyond burnout and work engagement)	Are related to favorable and unfavorable health-related outcomes	Are related to favorable and unfavorable motivational outcomes	Play a role in both processes	Play a role in both processes	Mental satiation (an unfavorable outcome) could be studied as an indicator of low motivation

are related only to positive outcomes. However, job demands and resources may both be related to positive and negative outcomes. What is crucial is that JD-R theory distinguishes two independent processes: a health impairment and a motivational process. To test such processes, one may use positive and negative indicators of health and motivation. For example, mental satiation could be studied as an indicator of low motivation. More examples of common problems in JD-R research can be found in **Table 2**.

PRACTICAL IMPLICATIONS

One reason why JD-R theory has become so popular is that it generates specific insights that help guide interventions. Broadly speaking, interventions may take place at the organizational level and at the individual level. The organizational level offers several possible intervention approaches. First, organizations and their human resource departments may want to use human resource practices that improve job demands and resources, including open communication and information sharing, initiatives to improve work–life balance, and opportunities for learning and development. Such interventions may take the form of workshops and trainings in which groups of employees or complete teams learn to improve their work–life balance. For example, to avoid work-to-family conflict, employees may learn new ways to create transition rituals and separate work and family time and activities. Employees may also do exercises in which they brainstorm about possible new ways through which work and family may enrich each other. In this way, employees will recover more from their work-related effort and will be better able to deal with their job demands and resources.

Second, organizations may want to improve their psychosocial work climate. Psychosocial safety climate refers to employees' shared perceptions of whether the management has developed and enacts policies, procedures, and practices for the protection of employees' psychological health, well-being, and safety (Dollard & Bakker 2010). In organizations in which the management fundamentally values the psychological health of workers, employees know that they can count on their leaders when they have stressful experiences at work. In such organizations, managers regularly communicate about psychological health issues and are involved in structural interventions to protect worker psychological health. Research has shown that organizations with a better psychosocial safety climate typically also provide a better combination of job demands and job resources to their employees, resulting in higher levels of work engagement and performance (Dollard & Bakker 2010, Idris et al. 2014).

A third practical implication of JD-R theory is that organizations need to constantly monitor and optimize the design of their jobs. When employees are exposed to an enriched job design, with optimal job demands and resources, they feel better, are more engaged, and are more productive. Job redesign may take the form of participative interventions, in which representatives identify the most important tasks and obstacles and generate ideas about how to optimize job demands and resources (Holman & Axtell 2016). Job redesign may also take the form of team-level job crafting, in which all members of a team discuss, practice, and implement possible proactive changes in their jobs (Tims et al. 2013). Teams may try to seek new challenge job demands and to reduce or optimize hindrance job demands. In addition, they may actively seek and mobilize team-level job resources. Such team job crafting can be expected to result in teams that collaborate and perform better (Oprea et al. 2019).

Fourth, leaders may learn to facilitate the right job demands and resources or may directly encourage employee proactive work behaviors (including job crafting, proactive vitality management, and playful work design) (Tummers & Bakker 2021). Organizations may organize lectures, workshops, and trainings in which leaders are taught how to recognize and regulate job demands and job resources. Job demands can be regulated by offering the right challenging tasks to followers and by taking away hindrance job demands (e.g., bureaucracy, role conflicts, hassles). Job resources can be regulated by offering constructive feedback, social support, and opportunities for skill variety and personal growth. Leaders may also enrich followers' job design by facilitating resource exchange among followers (Bakker 2022). For example, leaders may create work procedures through which employees provide help and feedback to each other. Managers may also enable resource exchange by facilitating collaboration at the team level and by changing the architecture of the work environment (e.g., by creating opportunities at work to be seated together through providing a coffeehouse, lounge, and meeting rooms). In addition, leaders may show example behaviors (e.g., job crafting, playful work) that can be modeled by followers.

Fifth, individual-level interventions may take the form of tailored JD-R interventions, idiosyncratic deals, and job crafting and recovery trainings. Ideally, such interventions should be tailored to the burnout or engagement levels of individual employees. Other possible options include workshops and trainings, in which employees learn to use their strengths, playful work design, and proactive vitality management to optimize their approach and experience of work, as well as their own well-being. Future research should evaluate the effectiveness of such interventions in preventing burnout and promoting work engagement.

BACK TO THE FUTURE

In our 2014 article, we argued that the literature had largely ignored possible daily fluctuations in burnout and work engagement, as well as momentary peaks and lows. In addition, we contended that job crafting represents the missing link in the reversed causal path from burnout and work

engagement to future job demands and job resources (Bakker et al. 2014). We also pled for more research using observable outcomes.

Looking forward from that time, we can see that our article has inspired a substantial number of studies. First, the number of diary and experience sampling studies on burnout and work engagement has increased exponentially. Using Web of Science, we were able to locate 191 new studies that were published since 2014. These studies have shown that employees report more burnout symptoms (fatigue and cynicism) and lower work engagement on the days on which they are exposed to high job demands and/or low job resources. For example, Klusmann et al. (2021) conducted a 14-day diary study and found that work-related positive events ("uplifts") were negatively related and work-related negative events ("hassles") were positively related to the emotional exhaustion component of burnout. Additionally, and consistent with JD-R theory, they found that exposure to more work-related uplifts than on an average day attenuated the positive association between work-related hassles and emotional exhaustion. Private uplifts were associated with a statistically significant decrease and private hassles with an increase in emotional exhaustion beyond work-related events.

Furthermore, Tadic et al. (2015) used JD-R theory to argue and show that, on the days on which employees were confronted with hindrance job demands (e.g., hassles, bureaucracy), they reported lower levels of positive affect and work engagement—unless there were job resources available on these days. In contrast, on the days on which employees were exposed to challenge job demands (e.g., time urgency, job complexity), they reported higher levels of positive affect and work engagement, but only on the days on which employees had access to job resources. As a final example, using a 10-day experience sampling study, Barnes et al. (2015) showed that poor nightly sleep influenced leaders to enact daily abusive behaviors via ego depletion and that these abusive behaviors ultimately resulted in decreased daily subordinate unit work engagement.

One other important question proposed by Bakker et al. (2014) was whether burnout and work engagement are predictive of job crafting over time. We expected that employees with higher levels of burnout would be less likely to craft their jobs and that those with higher levels of work engagement would be more likely to craft their jobs. In a review, Bakker & De Vries (2021) concluded that, over the course of time, job stress/burnout predicts decreased attempts of job crafting (and reduced recovery) and increased levels of self-undermining and avoidance coping. Additionally, some studies have shown that engaged employees are more likely to use job crafting. Lu et al. (2014) found that work engagement among Chinese employees was positively related to changes in physical job crafting and relational job crafting over 3 months of time. Harju et al. (2016) used a 3-year cross-lagged panel design in a Finnish study and found that employees who scored higher on work engagement were more likely to proactively seek social and structural job resources. In a similar vein, Hakanen et al. (2018) used a two-wave study with a 4-year time lag among Finnish dentists. The authors found that work engagement positively predicted job crafting in the form of increasing job resources and increasing challenge job demands and negatively predicted job crafting in the form of decreasing hindrance job demands. Burnout positively predicted job crafting in the form of decreasing hindering demands and negatively predicted increasing structural job resources.

Finally, we found only scarce examples of observer studies, in which other ratings and non-self-report methods were used to assess job demands and job resources. One exception is the study by Demerouti et al. (2018b), who used a multimethod design to investigate how social job demands (i.e., social interruptions) and resources (i.e., colleague support) in the service context influence employee (negative) (re)actions to customers through cynicism toward the job. They used observer ratings of employee–customer interactions regarding the number of interruptions and employee negative (re)actions during service encounters, employee self-reports of overall

colleague support and daily cynicism, and customer ratings of service quality. Results showed that the number of observed social interruptions during service encounters related positively to cynicism. Cynical employees exhibited more negative (re)actions toward their customers, who consequently reported to be less satisfied with the service quality. We would welcome more studies integrating alternative and less subjective measures.

FUTURE RESEARCH

Above, we elaborate on new research avenues, namely (*a*) the person × situation approach of JD-R, (*b*) multilevel JD-R theory, (*c*) new proactive approaches in JD-R theory, and (*d*) the work–home resources model. Each of these developments has clearly inspired new research, but considerably more work is needed to increase our knowledge of organizational life and to expand JD-R theory. We argue that, in addition to these important areas, JD-R theory and the literatures on burnout and work engagement will profit from new research on (*a*) JD-R interventions, (*b*) team-level approaches, and (*c*) demands and resources from other life domains.

JD-R Intervention Studies

Arguably, the best way to understand a phenomenon is by changing it. Therefore, it is important that future research continues to evaluate JD-R interventions. Remarkably, most interventions that have tried to influence burnout or work engagement have focused on individual employees, instead of teams or organizations as a whole. For example, regarding burnout, the meta-analysis of Maricuțoiu et al. (2017) showed that relaxation and role-related interventions were effective in reducing exhaustion and that interpersonal soft skills interventions improved personal accomplishment (see also Ahola et al. 2017). Knight et al. (2017) used a meta-analysis to identify interventions aimed at increasing work engagement. They identified five self-efficacy interventions that had a positive impact on work engagement. Consistent with these findings, Bakker & Van Wingerden (2021) showed that a personal resource intervention increased self-efficacy, assertiveness, and resilience and had an indirect impact on work engagement. Furthermore, research has documented the effectiveness of job crafting interventions (Oprea et al. 2019). Employees, by being trained to optimize their own job demands and resources, can increase their own work engagement and reduce their burnout.

Knight et al.'s (2017) systematic review and meta-analysis of work engagement interventions also identified a few interventions that focused on job resource building, but a closer examination of the interventions revealed that the focus was mostly on educating leaders, job training, and physical activity. In another meta-analysis of controlled trials, Vîrgă et al. (2021) showed that most interventions aimed at promoting work engagement used cognitive-behavioral techniques, mindfulness, development of soft skills, positive psychological techniques, and job crafting. Future research may use the present article as a basis for interventions at the organizational level. Thus, it would be interesting to see more research on structural interventions that aim to optimize job demands and resources at the organizational or team level. Moreover, it would be theoretically and practically important to know whether a combination of organizational-level and individual-level interventions might work best. Is a JD-R intervention at the organizational level more effective if individual-level factors such as personal resources and level of burnout or work engagement are also improved (see Tetrick & Winslow 2015)?

Team-Level Approaches

JD-R theory is a job design theory, assuming that the architecture of the organization (management, units, departments, teams) has important effects on employee well-being and performance.

Curiously, only few JD-R studies have used the team as the unit of analysis (e.g., Costa et al. 2015, Li et al. 2022). This is unfortunate because there is a lot to learn at the higher, organizational, or team level. Theoretically, the psychological processes that explain work engagement at the team level can be rather different from those at the individual level. Bakker (2022) has argued that social psychological processes play an important role. For example, interdependent team members may influence each other through a process of emotional contagion, through which they automatically mimic and synchronize feelings of burnout or work engagement (Bakker et al. 2006). Moreover, team members may influence their own and others' work engagement through the frequent exchange of job demands and resources, and the rate of exchange may depend on perceptions of reciprocity (Zeijen et al. 2020). Furthermore, research has shown that job crafting at the team level can instigate job crafting at the individual level and that job crafting has important implications for team-level and individual-level work engagement and performance (Tims et al. 2013).

Urien et al. (2021) developed a model that focuses on how the interplay of individual (e.g., attention) and interpersonal (i.e., information sharing) processes results in team burnout emergence. The model accounts for the role that salient team characteristics (e.g., team task interdependence) play in influencing the individual demands–resources balance and consequently the team members' burnout experience. The model also explains how team burnout relates to team members' burnout and via what mechanisms the former impacts team effectiveness. We hope that future JD-R research will examine such multilevel relationships.

Demands and Resources from Other Life Domains

The COVID-19 pandemic made clear that employee well-being is determined not only by the demands and resources in the work domain but also by the demands and resources from the home, organizational, and personal domains. One important lesson learned from the pandemic is that the demands and resources in the various life domains are interconnected and that individuals are constantly required to regulate these demands and resources. For example, because many employees started to work from home, the boundaries between the home and work domains became blurred. As a consequence, work life started to interfere with family life, but family resources were also used to buffer the impact of job demands (e.g., Landolfi et al. 2021).

Demerouti & Bakker (2023) expanded JD-R theory to make it more applicable to crisis situations and beyond. Specifically, they argued that the interplay between work (job and organizational) and nonwork (family and personal) role characteristics may be better able to explain how people react to demands because time and energy are finite resources. Similarly, the interplay between resources from various life domains may better explain their motivating impact, as the availability of resources from other life domains may reinforce the impact of job resources (a synergetic effect) or may sometimes diminish their impact (a substitution effect).

Consequently, Demerouti & Bakker (2023) proposed that resources from various life domains may buffer the impact of various demands on burnout and work engagement. Similarly, they proposed that personal, home, work, and organizational demands may boost the impact of various resources on work engagement. For instance, the impact of workload on exhaustion may be buffered not only by autonomy at work but also by autonomy at home. In addition, social support from colleagues at work may be even more motivating for employees who have high demands in their private life. This extension increases the complexity of JD-R theory, as well as its explanatory power and the ability of the theory to capture occupational health and well-being in the complex context in which it emerges. Future research is needed to test whether these new propositions hold.

CONCLUSION

In this article, we review the burnout and work engagement literatures. Using JD-R theory, we show that the combination of high job demands and low job resources leads to burnout, whereas the combination of high challenge job demands and job resources leads to work engagement—with important organizational consequences. JD-R theory outlines how organizations and their managers can influence well-being and how employees can use job crafting, proactive vitality management, and playful work design to avoid burnout and stay engaged. We discuss the progress in the field and elaborate on possible avenues for future research, including person × environment and multilevel approaches of JD-R and the work–home resources model. We hope that this article will inspire scholars to program new studies on burnout and work engagement in the next decades to come.

DISCLOSURE STATEMENT

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Contents

Errata

An online log of corrections to *Annual Review of Organizational Psychology and Organizational Behavior* articles may be found at http://www.annualreviews.org/ errata/orgpsych