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Job Demands–Resources theory and self-regulation: new explanations and remedies for job burnout

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ABSTRACT

Background: High job demands and low job resources may cause job strain and eventually result in burnout. However, previous research has generally ignored the roles of time and self-regulation.

Objectives: This theoretical article synthesizes the literature to propose a multilevel model that delineates how acute job strain translates into enduring and severe job burnout.

Methods: We integrate self-regulation perspectives in job demands-resources (JD-R) theory to propose that short-term job strain and eventually enduring burnout is the result of consistently high job demands and low job resources – combined with failed self-regulation.

Results: The model shows that when employees are confronted with increased job strain, they are more likely to use maladaptive self-regulation strategies, such as coping inflexibility and self-undermining. In addition, when job strain increases, employees are less likely to use adaptive self-regulation strategies, such as job stress recovery and job crafting. It follows that when the job becomes more stressful, stable resources become more important. Organizational resources such as human resource practices and healthy leadership may help employees to regulate their short-term fatigue and avoid enduring burnout. Furthermore, key personal resources like emotional intelligence and proactive personality may help employees to recognize and regulate their fatigue in an effective way.

Conclusion: The proposed model of burnout expands JD-R theory and offers important practical implications for the prevention and reduction of burnout.

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Work plays an important role in most people's lives. On the one hand, work offers structure, purpose, and meaning. Through work, individuals may make a real difference and have a positive impact on clients, customers, or colleagues. Every day, teachers inspire students, private equity investors create business value, and surgeons save the lives of patients. Such high-performance work behaviors may be experienced as highly rewarding and engaging. On the other hand, the same work may be very demanding and the source of considerable psychological strain. How does a fulfilling and meaningful job turn into a demanding and worrying experience? Job stress may be the consequence of repetitive work activities, work pressure, bureaucracy, or role conflicts (LePine et al., 2005). Alternatively, major life events like a divorce or illness of a family member may disrupt effective use of job resources and undermine effective functioning at work (Bakker et al., 2019). More generally, personal abilities,

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needs, and preferences change over time and may at some point no longer be in sync with one's daily work activities – creating misfit and feelings of job strain (Edwards et al., 1998).

When people burn out from their jobs, they are no longer interested in making a positive contribution. Their daily job demands start to exceed their personal and job resources (Bakker et al., 2014). Burnout is generally conceptualized as a chronic stress syndrome, including chronic feelings of exhaustion, negative attitudes toward work (cynicism), and reduced professional efficacy (Maslach et al., 2001). It can best be understood as a continuum ranging from acute fatigue that occurs after a day of hard work (and that disappears after a relatively short recovery period), to a severe and persistent form of exhaustion and accompanying problems, such as mental distancing from work, cognitive problems, and impaired mood that occurs after a long period of exposure to high job demands (and that only disappears after a long recovery period; Leone et al., 2008; Schaufeli et al., 2009).

Burned-out individuals feel exploited and exhausted by the same job they were once so enthusiastic about. The more severe these feelings, the higher the risk of serious consequences. Most studies have been conducted among employees with no or mild burnout complaints. Mild burnout complaints alone – which could be present for several years (Leone et al., 2008) – have been linked to psychological consequences such as work-related anxiety and depression. However, mild burnout complaints have also been related to physical consequences such as an increased risk of cardiovascular diseases, Type 2 diabetes, and all-cause mortality (Ahola, 2007; Ahola et al., 2010). Furthermore, employees with mild complaints are at risk for developing severe enduring burnout that is associated with long-term sick leave (Schaufeli et al., 2009). These findings indicate how important it is to understand and prevent (severe) job burnout.

While there are thousands of burnout studies published every year, most studies use suboptimal designs, are overly concerned with the psychometric properties of burnout instruments, and are more descriptive than explanatory. It is important to truly advance this literature so that we start to better understand, prevent, and reduce job burnout. In order to make scientific progress, we need to use more advanced research methodologies. In addition, we need to challenge and refine existing theories to address the management strategies and employee behaviors that play a central role in job burnout. Although there is general consensus in the literature that the combination of high job demands and low job resources offers an important explanation for burnout (Bakker & Demerouti, 2017; Lesener et al., 2019), it would be very helpful to have an even more fine-grained and integrated account of the organizational and psychological processes that lead to burnout. With this paper, we aim to make the following five contributions.

First, we briefly summarize what we know about burnout – what have we learned over the past decades? The focus here is on the most important causes of burnout as well as the evidence regarding interventions. Do burnout interventions reflect our knowledge of the causes of burnout, or are theories about the antecedents of burnout and interventions to prevent and reduce burnout disparate? Second, we integrate job demands-resources (JD-R) theory with self-regulation frameworks to show how acute job strain translates into enduring burnout, and discuss what we should do to stop the accumulation of fatigue. The central argument is that burnout is the result of poor working conditions combined with failed self-regulation. We consider avoidance coping and self-undermining as self-regulation strategies that are generally maladaptive. In addition, we discuss job stress recovery and job crafting as adaptive self-regulation strategies. A third contribution of this paper is that it offers new remedies for burnout. We propose top-down interventions, including several human resource practices and healthy leadership, and argue that structural organizational resources will help employees to regulate their short-term fatigue and avoid enduring burnout. Notably, the proposed model suggests that such interventions become more important with increasing job strain – when employees progress from one burnout phase (e.g., mild symptoms) to the next phase (e.g., enduring or more severe levels of burnout). Fourth, we discuss key personal resources that play a role in the self-regulation of job strain. Key personal resources like emotional intelligence and proactive personality help employees to recognize and regulate their fatigue in a timely and

effective way so that burnout is prevented. Fifth and finally, we explicate the role of time in the burnout process. We discuss how mild symptoms of burnout may translate into enduring and more severe levels of burnout through an accumulation process. We also propose how enduring burnout may amplify short-term job strain processes in a progressive way – from day to day.

What we have learned about burnout

Burnout has been defined as a work-related syndrome characterized by chronic exhaustion, cynicism, and reduced professional efficacy (Maslach et al., 2001). Exhaustion refers to the draining of energetic resources, consistent feelings of tiredness, and chronic fatigue. Cynicism refers to distancing oneself from work, and the development of negative attitudes toward the people with whom one works. Finally, reduced professional efficacy has been described as a decline in one's feelings of competence and successful achievement at work (Maslach & Leiter, 2008). Although there are several other definitions of burnout (e.g., Demerouti et al., 2010), most approaches include the exhaustion and cynicism dimensions of burnout. Thus, job burnout is an enduring psychological condition of ill-being signaling that employees are no longer able and no longer willing to invest effort in their work.

Causes of burnout

Research of the past decades has revealed that burnout is often the result of high job demands – aspects of the job that require sustained physical, emotional, or cognitive effort (Demerouti et al., 2001). Particularly workload, role ambiguity, role conflict, role stress, stressful events, and work pressure seem important (for meta-analyses, see Alarcon, 2011; Lee & Ashforth, 1996). After prolonged exposure to high job demands, employees become chronically exhausted and distance themselves psychologically from their work. In addition, job resources play an important role in the development of burnout. Job resources refer to the physical, psychological, social, or organizational aspects of the job that help to achieve work goals, and encourage personal growth and development (Bakker & Demerouti, 2017). When resources such as social support, autonomy, and skill variety are lacking, work starts to lose its meaning and thwarts the fulfillment of innate psychological needs.

Job resources are less strongly (negatively) related to burnout than job demands, but show a consistent negative relationship with the cynicism component of burnout (Demerouti et al., 2001). When employees have insufficient control, do not receive regular feedback, and cannot develop themselves professionally, they lose their interest in work and develop negative attitudes. If available, job resources can fulfill psychological needs and buffer the impact of job demands on burnout. For example, Bakker et al. (2005) showed that work overload, emotional demands, physical demands, and work-home interference did not result in increased levels of burnout when employees experienced job autonomy, received feedback, had access to social support, or had developed a high-quality relationship with their supervisor. Job resources weaken the link between job demands and burnout because they facilitate efficient and healthy coping with the demands of work (see also, Lesener et al., 2019; Xanthopoulou et al., 2007).

According to JD-R theory, employees may also use their *personal* resources to deal with job demands. Personal resources refer to self-beliefs regarding how much control a person has over the (work) environment (Hobfoll et al., 2003). Just like job resources, personal resources such as optimism, self-efficacy, and resilience are motivational because they help employees reach their work-related goals. Xanthopoulou et al. (2009a, 2009b) showed that personal resources had predictive validity for job resources, work engagement, and financial returns. Similarly, a recent meta-analysis of training interventions that aimed to increase optimism, self-efficacy, hope, and resilience showed that when employees increase these personal resources, they improve their well-being and job performance (Lupsa et al., 2019). Thus, when individuals have

a positive belief system and have access to many personal resources, they are less likely to experience job stress and burnout.

Consequences of burnout

Burnout has serious consequences. When employees are chronically fatigued and cynical about their work, they report severe psychological health problems (e.g., Shirom et al., 2005; Toker & Biron, 2012). For example, Ahola (2007) used a nationally representative sample of the Finnish working population including more than 3,000 employees. Burnout was related to an increased prevalence of depressive and anxiety disorders, as well as alcohol dependence. Similarly, research has demonstrated that burnout leads to poor physical health and increased sickness absence. Kim et al. (2011) conducted a study among social workers who were surveyed annually over a three-year period. Social workers with higher initial levels of burnout later reported more physical health complaints, including sleep disturbances, headaches, and gastrointestinal infections. Moreover, the burnout syndrome is an independent risk factor for type 2 diabetes and physician-diagnosed myocardial infarctions (Ahola & Hakanen, 2014), and increases the risk of all-cause mortality or premature death (e.g., Ahola et al., 2010). It is therefore not surprising that burnout (particularly exhaustion) is positively related to employee absenteeism (Toppinen-Tanner et al., 2005), and negatively related to job performance as reported by the supervisor, colleagues, and clients (Taris, 2006). Burnout is a real problem for individuals and for organizations at large.

Burnout interventions

Interventions to reduce burnout symptoms may focus on the organization or the individual. Organizational interventions are top-down management initiatives that target the whole organization, departments, or teams and do so in a structured and systematic manner. Examples are the introduction of new human resources (HR) practices, job redesign interventions (e.g., task restructuring), and leadership training (e.g., training leaders to provide job resources). In contrast, individual interventions are bottom-up change initiatives that target individual employees (Bakker, 2017). Examples are cognitive-behavioral interventions aimed at enhancing coping skills, social support, or relaxation. Most published interventions have taken the individual employee as a starting point. Maricuțoiu et al. (2016) meta-analyzed the effects of 47 intervention studies among employees from various occupational backgrounds. No less than 96% of the interventions focused on the individual employee, using cognitive-behavioral interventions, interpersonal skills interventions, relaxation interventions, and role-related interventions. The results showed significant but small effects on exhaustion ($d = .17$) and general burnout ($d = .22$), but not on cynicism (depersonalization; $d = .04$) or reduced professional efficacy ($d = -.02$). Dreison et al. (2018) analyzed the effects of burnout interventions among mental health providers reported in the past 35 years. Twenty-seven unique samples were included in the meta-analysis, representing 1,894 mental health workers. The interventions resulted in small but favorable effects on provider burnout (Hedges' $g = .13$). Moderator analyses suggested that person-directed interventions were more effective in reducing emotional exhaustion than organization-directed interventions. Job training/education was the most effective organizational intervention subtype.

In yet another study, West et al. (2016) meta-analyzed all burnout intervention studies among physicians. This meta-analysis included fifteen randomized controlled trials and 37 observational studies. The findings indicated that both individual-focused ($z = 3.74$) and organizational interventions ($z = 3.36$) can be effective in reducing physician exhaustion. Effective individual-focused strategies included mindfulness-based approaches, stress management training, and small group discussions. Effective organizational approaches included duty hour limitation policies and locally developed modifications to clinical work processes.

Finally, Panagioti et al. (2017) analyzed interventions to reduce physician burnout including 20 interventions. The physicians worked in primary care (general practitioners) and secondary care (e.g., physicians in intensive care units, oncologists, and surgeons). Physician-directed interventions included mindfulness, stress reduction techniques, exercise, educational interventions targeting physicians' self-confidence and communication skills, or a combination of these features. The organization-directed interventions concerned workload interventions such as rescheduling hourly shifts and reducing workload. Some studies tested more extensive organization-directed interventions incorporating discussion meetings to enhance teamwork, as well as leadership and structural changes. Panagioti and colleagues found that the interventions resulted in small reductions in burnout ($d = 0.31$). Most importantly, their findings showed that organization-directed interventions addressing a combination of job demands and resources were more effective than physician-directed interventions.

Taken together, several recent meta-analyses indicate that both individual and organizational interventions can reduce burnout symptoms. However, the effects of both types of interventions are usually small. One important reason for this is that many interventions do not consider the *structural* causes of burnout in the work environment: high job demands and low job resources. Although the research evidence clearly indicates that burnout is most likely in workplaces characterized by high job demands combined with low job resources, the organizational interventions are usually limited to job training/education, leadership training, or modifications to work processes; whereas individual interventions use mindfulness, stress management, cognitive-behavioral techniques, or relaxation. A stronger focus on the specific job demands and resources responsible for burnout in organizational as well as individual interventions may result in stronger effects. Another possible reason for the relative weak effects of burnout interventions is that all employees are treated in the same way. This is striking, because individual employees may (a) be exposed to different levels of job demands and resources; (b) be in different stages or phases of job strain / burnout; (c) be more or less successful in using recovery and job crafting strategies; and (d) differ in key personal resources, such as emotional intelligence and proactive personality. Effective interventions combine organizational and individual approaches, and consider time as well as differences between individual employees. In the next paragraph, we use JD-R, coping, and self-regulation theories to introduce a process model of burnout that takes these various facets into consideration.

JD-R theory and self-regulation

We have seen that the combination of high job demands and low job resources represents a high-stress work environment that may eventually lead to enduring burnout. Therefore, it is crucial that organizations continuously monitor and optimize job characteristics – for example, by setting realistic goals and challenges, optimizing job demands, and by providing sufficient job resources (Bakker & Demerouti, 2017, 2018; Demerouti & Peeters, 2018; Holman & Axtell, 2016). This is an ongoing process: employee job strain is dependent on *daily* job demands and resources (Bakker, 2014), and thus management and leaders should continuously communicate their vision and provide direction and support (Breevaart et al., 2014; Kelemen et al., 2020).

However, employees do not simply react to their leaders and work environment. They also actively *influence* their own job characteristics through adaptive or maladaptive self-regulation strategies. JD-R theory proposes that employees who experience work engagement (i.e., high levels of energy, dedication, and absorption) proactively try to optimize their job demands and resources through job crafting (Tims et al., 2012; Wrzesniewski & Dutton, 2001). In contrast, employees who experience job strain will start to undermine their own functioning at work (Bakker & Costa, 2014; Bakker & Wang, 2019).

In the present paper, we will specifically focus on what happens when employees experience an increase in *job strain* and start to show burnout symptoms over the course of time (days, weeks, months). As can be seen in [Figure 1](#), we propose that job strain not only leads to more maladaptive

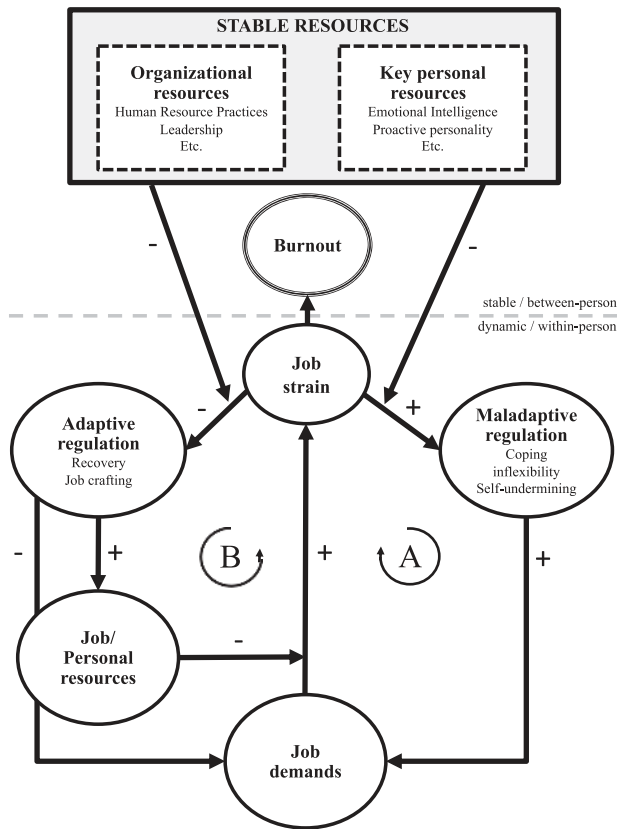


Figure 1. Burnout as a function of job demands, resources, and self-regulation.

Note: A = Maladaptive regulation feedback loop; B = Adaptive regulation feedback loop.

self-regulation cognitions and behaviors such as inflexible coping and self-undermining (right side), but also to fewer adaptive self-regulation strategies such as job stress recovery and job crafting (Figure 1, left side). Furthermore, we argue that an accumulation of job strain and an increased risk of burnout is more likely when employees have limited access to stable organizational resources and have few key personal resources. Thus, employers and employees both play a crucial role in the development, prevention, and reduction of job burnout. Importantly, we propose that only when employees go through the entire process repeatedly, the accumulated job strain will become so overwhelming that it causes burnout.

Maladaptive self-regulation

Job demands and strain may lead to maladaptive self-regulation cognitions and behaviors, because when employees experience higher job strain levels, they find it more difficult to concentrate and make more work-related mistakes (Van der Linden et al., 2005). In addition, the negative emotions (e.g., anger, sadness, irritation) experienced by employees under stress narrow their thought-action repertoires (Fredrickson, 2003). We discuss two maladaptive strategies, inflexible coping and self-undermining. We will see that individuals are more likely to engage in these cognitions and behaviors with increasing levels of job strain or burnout. This may result in a vicious cycle of job demands and strain – aggravating the job stress problem. Longitudinal cohort studies have suggested that employees go through the maladaptive regulation feedback loop again and again before job strain develops in full-blown and enduring burnout (Leone et al., 2008).

Coping inflexibility

Coping refers to “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141). Several different kinds of coping strategies have been identified in the literature. These coping strategies can be classified in one of two categories: approach and avoidance coping (Tobin et al., 1989). When individuals use approach coping, they actively try to change or decrease the stressor. For example, an employee who is confronted with a very high work pressure may actively try to optimize the way of working or try to lower the workload. In contrast, when individuals use avoidance coping, they come up with a workaround and try to avoid the stressor. Following the same example, the employee who is under time pressure to finish work may choose to take it easy and simply ignore the deadline.

Approach and avoidance coping are very similar to problem-focused and emotion-focused coping. Problem-focused coping refers to efforts to solve the problem and attempts to control the stressor, whereas emotion-focused coping involves the regulation of emotional responses to the problem and disengagement (Lazarus & Folkman, 1984; Skinner et al., 2003). Generally, it is thought that problem-focused coping is the best strategy to cope with stress. Previous research has indeed shown that burnout is positively related to the (over)use of emotion-focused coping (e.g., Antoniou et al., 2013; Chwalisz et al., 1992). Moreover, Shin et al. (2014) found in their meta-analysis of 36 studies that burnout is negatively related to problem-focused coping (e.g., social support seeking, reappraisal), and positively related to emotion-focused coping (e.g., wishful thinking, denial, self-blame).

However, the literature has shifted from the idea that one coping strategy is always more effective to cope with stress towards the idea that coping *flexibility* is best. Coping flexibility refers to the ability to use a variety of coping strategies in a way that fosters adjustment to situational demands (Bonanno & Burton, 2013; Cheng et al., 2014; Kato, 2012). For instance, avoidance or emotion-focused coping may be adaptive in the short term, because it creates opportunities for recovery – and consequently more effective (re)appraisal of the stressor (Sonnentag, 2012). However, avoidance coping may be maladaptive in the long term, because the stressor is not controlled (Cheng et al., 2014). Thus, when avoidance or emotion-focused coping is used in a rigid rather than flexible way, it becomes maladaptive over the course of time. In a similar vein, approach or problem-focused coping may generally be effective to cope with stress, but may be ineffective if the stressor is uncontrollable (Britt et al., 2016). In this case, it is probably more effective to alter one’s thoughts and feelings (emotion-focused coping).

Combining JD-R, coping, and self-regulation theories, we argue that when job strain increases, employees are more likely to engage in maladaptive modes of coping – that is, *coping inflexibility* (see Figure 1). That is, the more job strain or burnout symptoms individuals experience, the less able they will be to select a coping strategy that correctly matches the situational demands and monitor whether the chosen coping strategy is effective. This maladaptive behavior is caused by relapsing burnout symptoms such as feelings of exhaustion, impaired cognitive functioning, and negative mood. In line with this reasoning, several studies indeed demonstrated that depression and anxiety are positively related to coping inflexibility (Kato, 2012; Stange et al., 2017). Individuals lower in coping flexibility may overuse one coping strategy, while underusing other types (Bonanno & Burton, 2013; Cheng et al., 2014). Coping inflexibility impairs the ability to adjust to stressors and increases vulnerability for depression (Stange et al., 2017). Thus, over time, inflexible coping is likely to further increase job demands and strain.

In addition, when job demands and strain increase, attentional narrowing on the job demands or stressors reduces auxiliary coping strategies that are not directly related to the stressor itself. For example, when individuals have demands placed on them related to a work task, they stop doing activities that would normally maintain their mental health (e.g., exercise) and focus my attention on the demand directly (e.g., planning, problem-solving, working to task completion). Auxiliary

coping activities assist a person to manage job strain, but are not directly related to addressing the demanding task. Thus, coping inflexibility may also occur because of a progressive narrowing of coping behaviors that may have been in place previously.

Proposition 1. Job demands are positively related to inflexible coping through job strain (daily, weekly, and monthly effects).

Proposition 2. Inflexible coping is positively related to job strain through job demands (daily, weekly, and monthly effects).

Self-undermining

Bakker and Costa (2014) define self-undermining as “behavior that creates obstacles that may undermine performance” (p. 115). Self-undermining behaviors may take the form of poor communication, careless mistakes, and interpersonal conflicts. Such behaviors are most likely when job stress is already high. Self-undermining impairs job performance because it leads to an increase in stressors that add up to already existing high job demands. According to JD-R theory, self-undermining is the consequence of high levels of job strain and may be the fuel of a vicious cycle of high job demands and strain. Individuals under stress create obstacles because they lack energy resources and self-control (Vohs & Faber, 2007) to address the demands of working life. Indeed, several studies in occupational health psychology have shown that job demands and job strain are reciprocal: job demands are the causal predictors of various stress responses (exhaustion, burnout, health complaints), but job strain is also a causal predictor of job demands (Tang, 2014).

In their recent validation research, Bakker and Wang (2019) found that employees with higher scores on burnout (exhaustion and cynicism) were more likely to show self-undermining behaviors (visible to others). Moreover, consistent with the idea that self-undermining impairs effective functioning, they found a negative relationship between self-undermining and job performance. Thus, employees who are confronted with more job demands are more likely to experience job strain, which leads to self-undermining behaviors (confusion, stress, problems, conflicts). In another recent study, Bakker et al. (2020) found that employees reported more burnout complaints in the weeks job demands were relatively high. Consequently, employees engaged in more self-undermining behaviors during those weeks. These effects were even stronger for those who were already in trouble – employees who scored relatively high on enduring job burnout. Apparently, once individuals reach high levels of chronic exhaustion and cynicism, dealing with weekly work life becomes more stressful and leads to more negative outcomes. As can be seen in [Figure 1](#), self-undermining, in turn, is hypothesized to further increase job demands and strain over time.

Proposition 3. Job demands are positively related to self-undermining through job strain (daily, weekly, and monthly effects).

Proposition 4. Self-undermining is positively related to job strain through job demands (daily, weekly, and monthly effects).

Adaptive self-regulation

In this section, we discuss two adaptive self-regulation strategies, namely recovery and job crafting. Recovery means that employees try to lower their personal stress levels during off-job time, for example by engaging in leisure activities that are relaxing or activities that distract from work-related issues. Job crafting means employees proactively optimize the work environment by adjusting their tasks and relationships or their job demands and job resources. These adaptive behaviors modify the stress-response or the stressor, and will usually result in new personal and job resources. Unfortunately, individuals are less likely to engage in adaptive self-regulation cognitions and behaviors with increasing levels of job strain or burnout (see [Figure 1](#)).

Recovery

When employees are repeatedly exposed to high job demands, they will experience higher levels of strain, and they have more *reason* to engage in recovery activities after work. Unfortunately, people with more stress are less able to detach and relax. Recovery refers to a process of restoring the cognitive and energetic resources that have been used up during work (Sonnentag, 2003). More specifically, we speak of recovery when employees unwind after effort expenditure, and when their cognitive and energetic resources return to baseline (Sonnentag & Natter, 2004). There are many different activities people may engage in during off-job time to recover, including sports and exercise, engagement in hobbies, meditation, and social activities such as going to the movies and having dinner with friends.

However, Sonnentag and Fritz (2007) argue that it is not the specific activities that help one to recover from job stress, but rather their underlying attributes. Accordingly, there are four different experiences that help to recover from work-related effort: (a) psychological detachment – not thinking about work during nonwork time; (b) relaxation – having a low activation level; (c) mastery – facing a positive challenge to learn something new; and (d) control – having a feeling of control over nonwork time (Sonnentag & Fritz, 2007). Meta-analytic research has shown that these four strategies indeed reduce feelings of fatigue and increase feelings of energy (Bennett et al., 2018). Moreover, daily recovery experiences during off-job time are positively related to next-day work engagement and job performance (e.g., Binnewies et al., 2009; Ten Brummelhuis & Bakker, 2012a).

Regrettably, as shown in Figure 1, the research evidence indicates that when employees are exposed to high job demands and experience high levels of job strain, they are less likely to engage in recovery activities and less able to recuperate (e.g., Kinnunen & Feldt, 2013; Sonnentag, 2012). Employees who are stressed continue to work during off-job time. When the work is complex and the work pressure high, people take their work home and ruminate about work-related issues. This means that energetic and psychological resources are not replenished during off-job hours, but instead deplete over time (see Figure 1). As a consequence, employees will not be able to deal adequately with their future day-to-day job demands, erode their personal resources (Hahn et al., 2011), and lack the energy needed to mobilize their job resources such as social support and feedback (Bakker & Oerlemans, 2019).

Proposition 5. Job demands are negatively related to recovery through job strain (daily, weekly, and monthly effects).

Proposition 6. Recovery is negatively related to job strain through job demands (daily, weekly, and monthly effects).

Proposition 7. Recovery buffers the impact of job demands on job strain through (increased) job and personal resources (daily, weekly, and monthly effects).

Job crafting

Job crafting refers to the proactive adjustments individuals make in their tasks, relationships, and cognitions in order to make their work less stressful and more meaningful (Wrzesniewski & Dutton, 2001). By taking the initiative to optimize job demands, seek challenges, and increase job resources, individuals improve the match of their job with their talents, preferences, and aspirations (Demerouti & Peeters, 2018; Tims et al., 2012). In addition, by changing the perspectives on what they do (cognitive crafting), employees can create more meaning in what may otherwise be seen as unimportant work. For example, hospital cleaners may perceive themselves as an integral part of the healing team and in this way recognize that they make an important contribution to patient health (Wrzesniewski & Dutton, 2001).

Job crafting has been shown to have positive effects on job and personal resources. For example, in a three-wave study among employees working at a chemical plant, Tims et al. (2013) showed that job crafting resulted in an increase in various job resources over time, such as skill variety,

opportunities for development, and social support. These job resources, in turn, predicted increased work engagement and job satisfaction. In a similar vein, Van Wingerden et al. (2017) showed that a job crafting intervention among teachers resulted in an increase of performance feedback, opportunities for professional development, self-efficacy, and job performance measured one year later. Using a three-wave panel design with employees from three different European countries, Vogt et al. (2016) showed that job crafting had a positive relationship with future personal resources such as hope, resilience, self-efficacy, and optimism. Moreover, meta-analyses have shown that (interventions aimed at increasing) job crafting behaviors have a positive impact on well-being and job performance (Oprea et al., 2019; Rudolph et al., 2017). Job crafting is therefore an important strategy to regulate one's well-being and functioning at work.

Whereas work engagement is a positive outcome *and* predictor of job crafting (Bakker & Demerouti, 2017; Tims et al., 2015), the relationship between job strain and job crafting is negative. According to Bakker and Costa (2014), employees who experience higher levels of strain are more likely to withdraw from their work. As a consequence, individuals who experience more burnout symptoms lose more job resources over time. Ten Brummelhuis et al. (2011) found in their two-year follow-up study that employees who scored higher on burnout reported a stronger decrease in social support, a stronger reduction in job autonomy and information, and less opportunities to participate in decision-making (see also, De Beer et al., 2013). The meta-analysis by Rudolph et al. (2017) showed that job strain (exhaustion and burnout) was negatively related to job crafting. Thus, individuals with higher levels of job strain are less likely to proactively increase their job resources and job challenges. Consequently, employees under stress will have fewer job and personal resources available to deal with future job demands (see Figure 1).

Proposition 8. Job demands are negatively related to job crafting through job strain (daily, weekly, and monthly effects).

Proposition 9. Job crafting is negatively related to job strain through job demands (daily, weekly, and monthly effects).

Proposition 10. Job crafting buffers the impact of job demands on job strain through job and personal resources (daily, weekly, and monthly effects).

New remedies for burnout

The proposed burnout model assumes that the combination of high daily job demands and low daily resources is responsible for daily job strain, which results in more maladaptive and less adaptive self-regulation cognitions and behaviors. Over time, the failure to self-regulate job strain further aggravates the problem because when a person does not regulate feelings of stress and fatigue, this will result in more daily job demands and fewer job and personal resources. Eventually, this process may lead to enduring burnout. However, organizations also play an active role in this process. Organizations may offer structural resources such as various human resource (HR) practices (see Figure 1). In addition, organizations may offer the right challenges and resources to their employees by hiring and training individuals who can be transformational and healthy leaders. We will discuss these stable organizational resources below. Furthermore, two key personal resources will be discussed that help employees to deal effectively with daily job strain – emotional intelligence and proactive personality.

Organizational resources

Organizations may use various structural resources in order to reduce and prevent job burnout. This is traditionally the domain of human resource management, but structural resources may also be disseminated through direct supervisors. We will first discuss several HR practices, and then discuss what leaders can do. In Figure 1, organizational resources are positioned as higher-order,

stable resources that help employees use adaptive self-regulation strategies in response to job strain.

Human resource practices

Research in the area of human resources management that has used the JD-R framework has shown that human resource (HR) practices can have an important impact on job demands and resources, and may indirectly influence employee well-being (Bakker & Demerouti, 2018; Peccei & van de Voorde, 2019). For example, in a study among 81 home care organizations and more than 26,000 nurses, Taris et al. (2003) showed that various organizational interventions, such as employee participation in the planning of tasks, new protocols, task restructuring, and on-the-job training improved job demands and resources and resulted in reduced job strain (exhaustion) over a period of two-and-a-half years. In a similar vein, in their study among more than 15,000 employees from approximately 1200 workplaces, Croon et al. (2015) found that job enrichment HR practices (e.g., performance development and skills training) influenced organizational productivity through employee reports of job resources and job satisfaction. These findings indicate that organizations can use HR practices to optimize the design of the jobs they offer.

In the present paper, we argue that HR practices may also buffer the impact of job strain on maladaptive self-regulation (avoidance coping and self-undermining) and establish a positive link between job strain and adaptive self-regulation (recovery, job crafting). Specifically, we argue that HR managers should regularly monitor job stress levels among all employees, and take immediate measures when job stress levels are consistently high in certain teams or departments. This can be realized in several ways. An important starting point is to implement an online monitoring system or smartphone application that asks employees to regularly (e.g., once per month) indicate how fatigued or stressed they are. Using this information, HR practices may first include recovery training in which employees learn to detach psychologically from their work and relax during off-job time. Research has shown that such training can be effective and increase sleep-quality, feelings of mastery, and self-efficacy (Hahn et al., 2011; Siu et al., 2014). Other HR practices may include selecting new employees on key personal resources (e.g., proactive personality, emotional intelligence; see next section), or the provision of job crafting training programs in which employees learn to optimize their own job demands and resources (see Figure 1). Research of the past five years has shown that job crafting training can be effective (for a meta-analysis, see Oprea et al., 2019), and may even have positive effects on personal and job resources assessed one year after the intervention (Van Wingerden et al., 2017).

Proposition 11. HR practices moderate the positive relationships between job strain and (a) avoidance coping and (b) self-undermining. These relationships will be weaker when an organization implements HR practices that foster adaptive self-regulation (personnel selection, job stress recovery training, job crafting training).

Proposition 12. HR practices moderate the negative relationships between job strain and (a) recovery and (b) job crafting. These relationships will become positive when an organization implements HR practices that foster adaptive self-regulation (personnel selection, job stress recovery training, job crafting training).

Leadership

Individual employees play an important role in regulating their own fatigue. However, leaders can also help prevent or ameliorate the effects of job strain among employees. Particularly leaders at the lowest level of the organization who have regular contact with their team members may influence the job stress process in various different ways. One leadership style that has featured in the literature for several decades is transformational leadership (Bass, 1999). Research has provided strong evidence for the contention that transformational leadership has a positive impact on follower work engagement and performance (Breevaart et al., 2016; Wang et al., 2011). Particularly the individual consideration strategy seems important to recognize and regulate job strain in followers. When leaders take perspective and show individual attention, they recognize the personal needs

of their followers, and may use one-on-one coaching and mentoring to reduce job demands and job strain. Dimoff et al. (2016) evaluated the effectiveness of a mental health training program among two samples of organizational leaders. Their findings showed that the training program increased leaders' mental health literacy: compared to the control groups, the intervention groups reported enhanced knowledge of, and attitudes toward, mental health. Moreover, the training resulted in increased self-efficacy and a stronger intention to promote mental health at work. The program also resulted in a reduction in the duration of short-term disability claims by employees.

In a similar vein, Kaluza et al. (2020) showed that leaders' perceptions of organizational health climate were positively related to their health mindsets (i.e., their health awareness). These, in turn, were positively associated with their health-promoting leadership behaviors, which ultimately went along with better employee well-being (reduced exhaustion and increased engagement). These findings suggest that leaders can learn to recognize and regulate job strain and burnout complaints among their followers. Leaders may either facilitate adaptive self-regulation strategies, such as recovery and job crafting, or increase personal and job resources among their employees. Wang et al. (2017) showed that transformational leadership has a positive relationship with employee job crafting in the form of increasing challenges and job resources. This means that when leaders use more intellectual stimulation and individual consideration, their followers experience the trust and self-efficacy needed to engage in proactive work behaviors such as job crafting (see also, Hetland et al., 2018).

Thun and Bakker (2018) investigated the impact of empowering leadership: the process where a leader transfers power from oneself to employees and gives employees strength to make their own decisions by providing additional responsibility, decision-making authority over work, and resources (Ahearne et al., 2005). The results showed that when leaders empowered their followers, these followers were more inclined to engage in job crafting. This effect was particularly positive for employees who were high in optimism. Leaders may also ameliorate the effects of job strain among their employees by providing sufficient challenges and job resources. When leaders use an autonomy-supportive leadership style, they acknowledge employee perspectives, encourage self-initiation, and offer opportunities for choice and input (Reeve, 2015). Leader autonomy support is positively related to transformational leadership (Gilbert et al., 2017); it fosters agentic employee work behaviors and reduces employee job strain and burnout (Slemp et al., 2018). Other studies have suggested that transformational leaders provide job resources to their employees, such as support, feedback, and opportunities for growth (e.g., Breevaart et al., 2014). These resources help employees to deal effectively with their hindrance and challenge job demands (Breevaart & Bakker, 2018). Transformational leaders also satisfy their followers' basic needs by providing them with tasks that match their abilities, feedback, support, and job control (Hetland et al., 2015).

Proposition 13. Leadership moderates the positive relationships between job strain and (a) avoidance coping and (b) self-undermining. These relationships will be weaker when leaders recognize and help regulate employee job strain.

Proposition 14. Leadership moderates the negative relationships between job strain and (a) recovery and (b) job crafting. These relationships will become positive when leaders recognize and help regulate employee job strain.

Key personal resources

Key personal resources refer to management resources that facilitate the selection, alteration, and implementation of other resources (Thoits, 1994). Key resources include stable personality traits and abilities that facilitate an active and efficient coping style (Ten Brummelhuis & Bakker, 2012b). Examples are emotional intelligence (Salovey & Mayer, 1990), proactive personality (Bateman & Crant, 1993), and optimism (Scheier & Carver, 1992). Such higher-order personal resources facilitate the mobilization of other resources, and they make the use of other resources more effective. For

instance, individuals with a more optimistic and proactive personality (key resources) are more likely to begin a difficult task and more prone to actively seek support for completing their tasks (Hardré, 2003).

Emotional intelligence

Emotional intelligence (EI) can be defined as the ability to perceive and understand emotional processes and to regulate them effectively (Salovey & Mayer, 1990; Zeidner et al., 2008). Emotionally intelligent individuals are both highly conscious of their own emotional states, and able to identify and manage them. Thus, when they experience frustration, sadness, or something more subtle (e.g., feeling cranky, delighted, or concerned), they understand the emotion, recognize where it comes from, and are able to regulate the emotion. Moreover, high EI individuals are also especially tuned in to the emotions of others. This ability to be sensitive to emotional signals from within and from the social environment can make a person a better romantic partner, parent, leader, and worker. Indeed, research has shown that EI has a positive relationship with well-being and job performance (for meta-analyses, see Martins et al., 2010; O'Boyle et al., 2011). The ability to recognize and regulate emotions seems particularly important in emotionally demanding work situations, for example, when employees are confronted with demanding clients, patients, or pupils. Individuals with a high level of EI generally possess excellent emotion appraisal and coping skills, and therefore their experience of stress from emotionally demanding events is reduced (Pekaar et al., 2018a; Zeidner et al., 2008). Relatedly, emotional labor theory proposes that the necessity to regulate emotions at work is associated with increased job strain but not for high-EI employees who tend to choose the most effective emotion regulation strategies to deal with their own emotions (Grandey & Melloy, 2017).

High EI individuals will presumably also be well able to recognize their own job strain and fatigue, and consequently be able to regulate their strain (Figure 1). Pekaar et al. (2018b) found that this form of emotional intelligence was predictive of reduced stress, increased work engagement, and improved objective performance. Moreover, in other research these authors found that social work trainees who were able to recognize their own emotions (including fatigue) engaged in more emotion regulation behaviors and more often proactively asked for social support, coaching, and feedback (i.e., job crafting), resulting in higher levels of well-being (Pekaar et al., 2018a). The appraisal of own emotions particularly fostered adaptive self-regulation when trainees also regulated their emotions. Emotional intelligence seems a key personal resource that is able to moderate the link between job strain and (a) maladaptive self-regulation, and (b) adaptive self-regulation.

Proactive personality

Proactive personality is defined as the “the relatively stable tendency to effect environmental change” (Bateman & Crant, 1993, p. 103). It refers to the dispositional inclination to engage in proactive behavior in a variety of situations. Individuals with a proactive personality are inclined to change their circumstances intentionally, including their physical and social environment. They identify opportunities, take action, and persevere until the environment is in line with their needs and goals (Crant, 1995). Whereas some people react to and are shaped by their environment, proactive people challenge the status quo and take the initiative to have an impact on their environment.

Previous research has shown that proactive personality can explain unique variance in criteria over and above that accounted for by the Big Five personality factors. Fuller and Marler (2009) meta-analyzed the findings from 107 independent studies, and found that proactive personality is positively related to taking charge/voice behavior as well as supervisor-rated job performance. Moreover, they discovered that those with a proactive personality are more likely to have objective and subjective career success. Proactive personality's relationship with overall job performance was stronger than that reported for any of the Big Five factors or the Big Five collectively. In a similar vein, Major et al. (2006) showed that, controlling for the Big Five, proactive personality uniquely predicted

objective development activity (i.e., the number of training courses registered for during a six-month period and the number of hours spent in training during that period), through the motivation to learn. In their study among 165 employees and their supervisors, Greguras and Diefendorff (2010) showed that proactive personality predicted in-role performance and organizational citizenship behaviors (e.g., altruism, courtesy, and sportsmanship), through need satisfaction. These findings indicate that proactive personality captures “conceptually and empirically, some unique elements of personality not accounted for by the five-factor model” (Crant & Bateman, 2000, p. 66). According to Crant (2000), proactivity has a positive impact on employee attitudes and behaviors because proactive individuals identify or create opportunities that produce favorable conditions for individual or team effectiveness.

Since individuals with a proactive personality are likely to take initiative, they can be expected to respond actively to stressful job demands. Thus, when job demands continue to be high and result in job strain, proactive individuals will take charge, avoid maladaptive self-regulation, and engage in adaptive self-regulation (see Figure 1). Specifically, they are more likely than others to proactively manage their vitality (Op den Kamp et al., 2018), and to regularly distance themselves from work to recover from the work-related effort. Moreover, those with a proactive personality are more likely to engage in job crafting – to make adjustments in job tasks, job demands and resources in order to make their work less stressful and more meaningful (Bakker et al., 2012). By engaging in recovery activities and by optimizing their job characteristics, employees generate personal and job resources that can be used to deal with job demands, which will lead to lower job strain.

Proposition 15. Key personal resources (e.g., emotional intelligence, proactive personality) moderate the positive relationships between job strain and maladaptive self-regulation in the form of (a) avoidance coping and (b) self-undermining. These relationships will be weaker when employees have more key personal resources.

Proposition 16. Key personal resources (e.g., emotional intelligence, proactive personality) moderate the negative relationships between job strain and adaptive self-regulation in the form of (a) recovery and (b) job crafting. These relationships will become positive when employees have more key personal resources.

From job strain to enduring burnout

The proposed burnout model (Figure 1) clearly shows how behavioral strategies may create a feedback system, and set a chain of events in motion that transform mild burnout symptoms into enduring and more severe levels of burnout. However, there is more that can be said about the role of time in the burnout process. First, the literature is not very clear regarding how much time it takes to develop job burnout. Does it take weeks, months, or years of exposure to high job demands? Most burnout research has employed a cross-sectional design, which makes it impossible to learn about the development of burnout. Moreover, most research has focused on individuals who are relatively healthy and who only report mild symptoms of burnout. One notable exception is the study by Sonnenschein et al. (2007), who investigated differences in exhaustion/fatigue between healthy employees and a group that was diagnosed as clinically burned-out. The findings revealed that the burnout group scored consistently higher on fatigue from day to day, and also within the day. Whereas healthy employees showed an increase in momentary fatigue over the course of the day (repeated measures taken between 6:00 and 24:00), the burnout group was tired throughout the whole day. However, what is needed is research that establishes after how much time exposure to high job demands leads to irreversibly high levels of fatigue and stable negative attitudes towards work (i.e., burnout).

Second, we argue that employees need to go several times through the feedback cycles in Figure 1 in order to develop burnout. After repeated exposure to job demands, and after repeated instances of maladaptive coping, short-term fatigue will accumulate and become enduring and more severe.

Future research needs to investigate how long this process takes and how organizations and individual employees can best intervene. A third and final important issue is that enduring burnout may aggravate the stressful impact of daily job demands on daily job strain. Bakker and Costa (2014) have argued that when employees experience enduring and severe levels of burnout, they are less well able to deal with daily job demands, and less able to utilize the available job resources. Moreover, it is conceivable that with progressive levels of burnout, individuals will need to compensate more in order to reach their performance goals. Hockey (1997) has argued that performance may be protected under stress by recruiting further resources, but only at the expense of increased effort – which comes with behavioral and physiological costs. Thus, compensatory effort will further exhaust employees already at risk for burnout, and increases the risk of maladaptive regulation. On the basis of these insights, we formulated our final proposition.

Proposition 17. Enduring burnout moderates the positive relationships between (a) daily job demands and job strain; and (b) daily job strain and maladaptive strategies. These relationships are stronger for employees who score high (vs. low) on enduring burnout.

Discussion

Work offers opportunities for growth and development, and may be highly engaging. However, work may also be the source of considerable stress. In this paper, we proposed a model integrating JD-R and self-regulation literatures to understand the development, reduction, and prevention of job strain and burnout. Accordingly, daily job demands evoke strain and lead to more maladaptive and less adaptive self-regulation cognitions and behaviors. When employees experience job strain, they show avoidance coping and self-undermining, resulting in more job demands and more job strain. Moreover, employees who experience strain show impaired recovery and reduced job crafting, resulting in a lack of personal and job resources as well as a lack of challenges over time. This progressive stress process will eventually result in enduring burnout. Organizations may reduce and prevent job strain and burnout by providing stable resources in the form of HR practices and healthy leadership. Moreover, employees with key personal resources prevent job burnout by using their stable characteristics and abilities such as emotional intelligence and proactive personality. Thus, employers and employees both play a crucial role in the development, prevention, and reduction of burnout.

One important innovation of the proposed model compared to previous models is that it shows the continuous interplay between the organization and individual employees in the burnout process. When job demands increase and persist to be very high, employees may no longer be able to use adaptive self-regulation strategies and may enter a loss spiral of strain and health impairment (Bakker & Demerouti, 2017, 2018; Demerouti et al., 2019). In the model, time is modeled as an important factor – showing how job strain and burnout may progress over the course of time. Future research may want to study tipping points – to investigate at what point short-term fatigue transforms into long-term exhaustion and enduring burnout. How much time does it take to burn out from work? Does it take weeks, months, or years? Such research would need to use a research design with repeated short-term assessments as well as repeated long-term assessments (measurement-burst designs; see Dormann & Griffin, 2015; Sliwinski, 2008).

Moreover, in the multilevel model, stable (organizational and individual) resources at level 2 (between organizations and between individuals) are distinguished from processes taking place on a daily, weekly, or monthly basis – at level 1. It would be extremely interesting to conduct intervention research in which stable organizational resources are increased at the organizational level. Do such organizational resources buffer the impact of daily job design characteristics on daily employee well-being and work behaviors? Similarly, innovative research could test the cross-level interaction between daily job demands and key personal resources – for example, test the hypotheses that emotionally intelligent and proactive individuals are better able to deal with the stress of daily working life.

Further extensions of the proposed model

The proposed model includes several specific self-regulation strategies, but the list of self-regulation strategies used is not exhaustive. It is conceivable that other self-regulation strategies such as strengths use, playful work design, and proactive vitality management (Bakker & Van Woerkom, 2017) will also be effective in dealing with job strain. Whereas strengths use means that one capitalizes on one's strong points (e.g., creativity) – often resulting in successful performance, playful work design refers to redesigning the work experience so that it is more fun and more meaningful (Scharp et al., 2019). Proactive vitality management refers to proactively managing one's mental and physical energy so that one can effectively deal with the next work task (Op den Kamp et al., 2018). Furthermore, we did not include stable organizational or personal *demands* in the model, although such demands may play a significant role and facilitate maladaptive self-regulation cognitions and behaviors. For example, in organizations with a toxic, workaholic culture and/or a chronic high workload, the undesirable impact of daily job strain on maladaptive and adaptive self-regulation strategies may be stronger.

In addition, personal demands like workaholism and perfectionism may act in a similar way, and facilitate loss spirals of job demands and burnout (e.g., Harari et al., 2018; Hill & Curran, 2016). Personal demands have been defined as “the requirements that individuals set for their own performance and behavior that force them to invest effort in their work and are therefore associated with physical and psychological costs” (Barbier et al., 2013, p. 751). When personal demands are very high, it will be difficult for employees to use effective recovery strategies, because they will be constantly highly involved in work and find it difficult to detach. Moreover, job crafting will generally be less likely among those with high personal demands, since job crafting also has energetic costs (Bakker & Oerlemans, 2019). Future research may explicitly test these notions, and further expand the proposed model of burnout.

Conclusion

In this article, we integrated self-regulation perspectives in JD-R theory to show how acute job strain translates into enduring burnout. Accordingly, when employees are confronted with increased job strain, they are more likely to use maladaptive self-regulation strategies (avoidance, self-undermining), and less likely to use adaptive self-regulation strategies (recovery, job crafting). Organizational resources such as HR practices and healthy leadership may help employees to regulate their short-term fatigue. Similarly, key personal resources may help employees to recognize and regulate their fatigue in an effective way. We hope that the proposed model will be tested by scholars in different parts of the world, and will inspire practitioners to develop better interventions to prevent and reduce job burnout.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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