3

Job Demands–Resources Theory

Arnold B. Bakker

Erasmus University Rotterdam, The Netherlands and
Lingnan University, Hong Kong

Evangelia Demerouti

Eindhoven University of Technology, The Netherlands

Introduction

Why do some employees burn out or get bored by their work, whereas others are so enthusiastic about their work that time seems to fly? The question of what causes job stress and what motivates people has received a lot of research attention during the past five decades. Job design theory has played an important role in this respect. "Job design" was originally defined as the set of opportunities and constraints structured into assigned tasks and responsibilities that affect how an employee accomplishes and experiences work (Hackman & Oldham, 1980). Thus, job design scholars tried to unravel which job characteristics make people feel satisfied with their job, and motivated to reach organizational goals. Nowadays, job design is defined more broadly as "encapsulating the processes and outcomes of how work is structured, organized, experienced, and enacted" (Grant, Fried, & Juillerat, 2010, p. 418). According to Grant and his colleagues, this broader definition opens the door for dynamic, emergent roles as opposed to merely emphasizing static job descriptions composed of fixed tasks assigned by management (see also, Parker, Wall, & Cordery, 2001).

In this chapter, we discuss job demands–resources (JD-R) theory, which represents an extension of the job demands–resources model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) and is inspired by job design and job stress theories. Whereas job design theories have often ignored the role of job stressors or demands, job stress models have largely ignored the motivating potential of job resources. JD-R theory combines the two research traditions, and explains how job demands and resources have unique and multiplicative effects on job stress and motivation. In addition, JD-R theory proposes reversed causal effects: whereas burned-out employees may create more job demands over time for themselves, engaged workers mobilize their own job resources to stay engaged. Before we outline the building blocks of JD-R theory and possible JD-R interventions, we will discuss four early models that have had an important impact on our thinking.

Early Models

Interestingly, early models of work motivation and job stress have largely ignored each other's literatures. Since JD-R theory combines principles from both literatures, we briefly discuss four influential models, namely two-factor theory (Herzberg, 1966), the job characteristics model (Hackman & Oldham, 1980), the demand–control model (Karasek, 1979), and the effort–reward imbalance model (Siegrist, 1996).

Two-factor theory.
Herzberg's (1966; Herzberg, Mausner, & Snyderman, 1959) two-factor theory suggests that there are two independent sets of circumstances that drive employee satisfaction and motivation, namely *hygiene factors* and *motivator factors*. Whereas hygiene factors (also called dissatisfiers), if absent, are postulated to make employees unsatisfied at work, motivator factors (also called satisfiers) are postulated to make employees feel good about their jobs. Using data from engineers and accountants, Herzberg found the following hygiene factors: company policies, supervision, salary, interpersonal relations, and working conditions. He compiled this list from responses given to the question "What makes you feel bad about your job?" The items in this list needed to be present to avoid dissatisfaction. In contrast, motivator factors included achievement, recognition, nature of work, responsibility, and advancement, all of which presumably promote satisfaction. Thus, an

increase in hygiene factors is expected not to promote satisfaction and a lack of one or more of them will promote dissatisfaction. For example, a low salary, or one perceived as lower than one's coworkers, would be expected to increase dissatisfaction. However, once a fair level of pay is established, money is no longer a significant motivator for job satisfaction and performance. According to the two-factor theory, without motivators, employees will perform their jobs as required, but with motivators, employees will increase their effort and exceed the minimum requirements.

Research on the two-factor theory has challenged the validity of distinguishing between hygiene factors and motivators. The critique boils down to the contention that evidence for the two-factor model depends on the method used, and that the model has received limited support for predicting job satisfaction (Ambrose & Kulik, 1999). However, an important contribution of Herzberg's work is that he made researchers and practitioners aware of the potential of job enrichment; jobs can be redesigned, enlarged, and enriched to increase motivation and job satisfaction (Grant et al., 2010).

The job characteristics model.
The job characteristics model (Hackman & Oldham, 1976, 1980) examines individual responses to jobs (e.g., job satisfaction, sickness absenteeism, personnel turnover) as a function of job characteristics, moderated by individual characteristics (Roberts & Glick, 1981). Hackman and Lawler (1971) define the core job characteristics as: skill variety (breadth of skills used at work), task significance (impact that the work has on the lives or work of others), task identity (opportunity to complete an entire piece of work), feedback (amount of information provided about effectiveness of job performance), and autonomy (degree to which the job provides substantial freedom, independence, and discretion in determining goal-directed behavior at work).

Core job characteristics are expected to influence job satisfaction and intrinsic work motivation through the attainment of three critical psychological states (CPSs; Hackman & Lawler, 1971; Hackman & Oldham, 1976, 1980): experienced meaningfulness of the work, experienced responsibility for outcomes, and knowledge of the results of work activities. However, most research has omitted the critical psychological states from the model, focusing instead on the direct impact of the core job characteristics on the outcomes. Meta-analyses have demonstrated that the presence of the core job characteristics, in particular job autonomy, leads to positive employee attitudinal outcomes (Fried & Ferris, 1987; Parker & Wall, 1998). Further,

research on the mediating role of the three CPSs in the relationship between job characteristics and attitudinal outcomes offers only partial support for this hypothesis (e.g., Renn & Vandenberg, 1995; see, for a meta-analysis, Behson, Eddy, & Lorenzet, 2000). The model further suggests that the relationship between job characteristics and CPSs as well as between CPSs and outcomes is stronger for individuals with high growth need strength (i.e., those who are highly motivated to learn and grow on the job). Evidence for the latter hypothesis is inconsistent (Graen, Scandura, & Graen, 1986).

The demand–control model.
A central hypothesis in the demand–control model (DCM; Karasek, 1979; Karasek & Theorell, 1990) is that strain will be highest in jobs characterized by the combination of high job demands and low job control. Such jobs are called "high-strain jobs." In contrast, the active learning hypothesis in the DCM states that task enjoyment, learning, and personal growth will be highest in jobs characterized by the combination of high job demands and high job control. Although such jobs are intensively demanding, employees with sufficient decision latitude are expected to use all available skills, enabling a conversion of aroused energy into action through effective problem solving. Karasek has labeled these jobs "active-learning jobs." Like the job characteristics model, the DCM has acquired a prominent position in the literature. However, the empirical evidence for the model is mixed (De Lange, Taris, Kompier, Houtman, & Bongers, 2003; Van der Doef & Maes, 1999). Additive effects of job demands and job control on employee wellbeing and motivation have often been found, but many studies failed to produce the interaction effects proposed by the DCM. Moreover, in a reanalysis of the 64 studies reviewed by Van der Doef and Maes (1999), Taris (2006) showed that only 9 out of 90 tests provided support for the demand × control interaction effect. Several scholars attribute this lack of evidence to the conceptual and methodological limitations of the model (e.g., Carayon, 1993; De Jonge, Janssen, & Breukelen, 1996; Taris, Kompier, De Lange, Schaufeli, & Schreurs, 2003).

The effort–reward imbalance model.
Finally, the effort–reward imbalance (ERI) model (Siegrist, 1996) emphasizes the reward, rather than the control structure of work. The ERI model assumes that job stress is the result of an imbalance between effort (extrinsic job demands and intrinsic motivation to meet these demands) and reward (in terms of salary, esteem reward, and security/career opportunities—i.e.,

promotion prospects, job security, and status consistency). The basic assumption is that a lack of reciprocity between effort and reward (i.e., high effort/low reward conditions) will lead to arousal and stress (cf. equity theory; Walster, Walster, & Berscheid, 1978), which may, in turn, lead to cardiovascular risks and other stress reactions. Thus, having a demanding but unstable job, and achieving at a high level without being offered any promotion prospects, are examples of a stressful imbalance. The combination of high effort and low reward at work was indeed found to be a risk factor for cardiovascular health, subjective health, mild psychiatric disorders, and burnout (Siegrist, 2008; Tsutsumi & Kawakami, 2004). Unlike the DCM, the ERI model introduces a personal component in the model as well. Overcommitment is defined as a set of attitudes, behaviors, and emotions reflecting excessive striving in combination with a strong desire for approval and esteem. According to the model, overcommitment may moderate the association between effort–reward imbalance and employee wellbeing. Thus, personality is expected to be able to further qualify the interaction between effort and reward. Some evidence for this pattern has been reported (e.g., De Jonge, Bosma, Peter, & Siegrist, 2000).

Critique on Early Models

There are four, partly overlapping problems with earlier models of job stress and work motivation. First, each of the models has one-sided attention for either job stress or work motivation. A second point of critique is that each of the models is relatively simple, and does not take into consideration the viewpoints of other existing models. Often, only a few variables are expected to describe all possible working environments. Third, each of the early models is static: it is assumed that the models with the specific variables hold across all possible work environments. Finally, the nature of jobs is rapidly changing, and existing job stress or motivation models do not take this volatility into account. Below, we discuss each of these points in a little more detail.

One-sidedness.
Research on job stress and work motivation has typically developed in two separate literatures. This means that research on motivation often ignores research on stress and vice versa. We see similar trends in organizations, where human resources managers focus on employee motivation and job satisfaction, and where company doctors and medical officers focus on

job stress and sickness absence. However, it is evident that job stress is significantly related to work motivation. For example, Leiter (1993) has argued and found that employees who are stressed by their work and become chronically exhausted become demotivated and are inclined to withdraw psychologically from their work. Exhausted employees become cynical about whether their work contributes anything and wonder about the meaning of their work (see also, Bakker, Van Emmerik, & Van Riet, 2008). Furthermore, we will see later in this chapter that working conditions fostering job stress interact with working conditions fostering motivation.

Simplicity.
The basic assumption of both the DCM and the ERI model is that job demands often lead to job stress when certain job resources are lacking (autonomy in the DCM; salary, esteem reward, and security/career opportunities in the ERI model). In general, one may argue that the strength of these models lies in their simplicity. This can also be seen as a weakness, since the complex reality of working organizations is reduced to only a handful of variables. This simplicity does no justice to reality. Indeed, research on job stress and burnout has produced a laundry list of job demands and (lack of) job resources as potential predictors, not only including high psychological and physical job demands, lack of rewards, and lack of autonomy, but also emotional demands, low social support, lack of supervisory support, and lack of performance feedback, to name just a few (Alarcon, 2011; Lee & Ashforth, 1996). This raises the question whether the early models are applicable to the universe of job positions, and whether in certain occupations other combinations of demands and (lack of) resources than the ones incorporated in the models may be responsible for job stress (Bakker & Demerouti, 2007). Whereas the DCM and the ERI model have as their basic premise that specific job demands (particularly work overload, work pressure) interact with certain resources, the motivational models only incorporate certain job resources and do not reserve any role for job demands. We would argue that in all jobs some challenging demands are needed, because otherwise work engagement may be thwarted and job performance undermined.

Static character.
A third point of critique is the static character of the models. Thus, it is unclear why autonomy is the most important resource for employees in the DCM (and social support in the extended demand–control–support

6

model; Johnson & Hall, 1988). Would it not be possible that in certain work environments totally different job resources prevail (for example inspirational leadership in an Internet start-up, or open communication among reporters of a TV station)? Remarkable in this context is that the ERI model (Siegrist, 2008) postulates salary, esteem reward, and status control as the most important job resources that may compensate for the impact of job demands on strain. In a similar vein, it is unclear why work pressure or (intrinsic and extrinsic) effort should always be the most important job demands, whereas other aspects are neglected. This is a drawback, since we know that in certain occupations (e.g., teachers, nurses, doctors, waitresses), emotional demands are extremely important (Bakker & Demerouti, 2007), whereas in other occupations these demands are less prevalent. For example, the work of software engineers and air-traffic controllers is more about the processing of information than about working with people (Demerouti et al., 2001), and therefore cognitive job demands are more important in these occupations. Similarly, the job characteristics model (Hackman & Oldham, 1980) focuses exclusively on five specific job characteristics, namely skill variety, task significance, task identity, feedback, and autonomy. Although Hackman and Oldham had good reasons to choose these five job resources as important "enrichers" of one's work environment, it is not very difficult to come up with other valuable job resources. For example, several studies have shown that opportunities for development and supervisory coaching are important motivators (Bakker & Demerouti, 2007), and research on the ERI model has indicated the importance of job security and distributive as well as procedural fairness.

Changing nature of jobs.
A fourth point of critique concerns the fact that the nature of jobs is changing rapidly. Contemporary jobs seem to be more complex in terms of functions and networking structures, with the role of information technology being more important than ever to execute one's job (Demerouti, Derks, Ten Brummelhuis, & Bakker, in press), and with individuals negotiating own work content and conditions. This changing nature of jobs also means that different working conditions might prevail than was the case four or five decades ago, when the early models were developed. Cognitive work has come to be an important demanding work characteristic that is relevant for many jobs, while opportunities for development and learning are resources that individuals seek in their jobs nowadays. Moreover, in order for organizations to keep valuable employees they negotiate with them distinct working

conditions (i.e., idiosyncratic deals; Rousseau, 2005) such that they can retain them in their workforce. Consequently, it is an illusion to think that identifying a few work characteristics in a model on job stress or motivation would be sufficient to describe the complexity of contemporary jobs. Theories that allow more flexibility in terms of the work-related factors that are potentially relevant offer a more realistic representation of the work reality.

Conclusion

Early models of job stress and motivation have produced valuable insights with regard to what influences employee wellbeing. However, influential models in both the stress and motivation literatures have largely neglected each other. We argue that stress and motivation should be considered simultaneously, and that the four main points of critique on the early models should be addressed: the one-sidedness, simplicity, and static character of the models, as well as the changing nature of jobs.

Job Demands–Resources Theory

During the past decade, the number of studies with the job demands–resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti & Bakker, 2011; Demerouti et al., 2001) has steadily increased. The model has been used to predict job burnout (e.g., Bakker et al., 2005, 2008; Demerouti et al., 2001), organizational commitment, work enjoyment (Bakker, Van Veldhoven, & Xanthopoulou, 2010), connectedness (Lewig, Xanthopoulou, Bakker, Dollard, & Metzer, 2007), and work engagement (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Hakanen, Bakker, & Schaufeli, 2006). In addition, the JD-R model has been used to predict consequences of these experiences, including sickness absenteeism (e.g., Bakker, Demerouti, De Boer, & Schaufeli, 2003a; Clausen, Nielsen, Gomes Carneiro, & Borg, 2012; Schaufeli, Bakker, & Van Rhenen, 2009), and job performance (e.g., Bakker et al., 2008; Bakker, Demerouti, & Verbeke, 2004). In fact, we have now seen so many studies, new propositions, and several meta-analyses on the JD-R model (Crawford, LePine, & Rich, 2010; Halbesleben, 2010; Nahrgang, Morgeson, & Hofmann, 2011) that the model has matured into a theory. With JD-R theory, we can understand, explain, and make predictions about employee wellbeing (e.g., burnout, health, motivation, work engagement) and job performance. In this section, we discuss the most important building blocks of JD-R theory.

Flexibility

One important reason for the popularity of the JD-R theory is its flexibility. According to the theory, all working environments or job characteristics can be modeled using two different categories, namely job demands and job resources. Thus, the theory can be applied to all work environments and can be tailored to the specific occupation under consideration. Job demands refer to those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological effort and are therefore associated with certain physiological and/or psychological costs (Demerouti et al., 2001). Examples are a high work pressure and emotionally demanding interactions with clients or customers. Although job demands are not necessarily negative, they may turn into hindrance demands when meeting those demands requires high effort from which the employee has not adequately recovered (Meijman & Mulder, 1998). Job resources refer to those physical, psychological, social, or organizational aspects of the job that are: (a) functional in achieving work goals; (b) reduce job demands and the associated physiological and psychological costs; or (c) stimulate personal growth, learning, and development (Bakker, 2011; Bakker & Demerouti, 2007). Hence, resources are not only necessary to deal with job demands, but they are also important in their own right. Whereas meaningful variations in levels of certain specific job demands and resources can be found in almost every occupational group (like work pressure, autonomy), other job demands and resources are unique. For example, whereas physical demands are still very important job demands nowadays for construction workers and nurses, cognitive demands are much more relevant for scientists and engineers.

Two Processes

A second proposition of JD-R theory is that job demands and resources are the triggers of two fairly independent processes, namely a health impairment process and a motivational process (Figure 3.1). Thus, whereas job demands are generally the most important predictors of such outcomes as exhaustion, psychosomatic health complaints, and repetitive strain injury (RSI) (e.g., Bakker, Demerouti, & Schaufeli, 2003b; Hakanen et al., 2006), job resources are generally the most important predictors of work enjoyment, motivation, and engagement (Bakker et al., 2007, 2010). The reasons for these unique effects are that job demands basically cost effort and consume energetic resources, whereas job resources fulfil basic psychological needs,
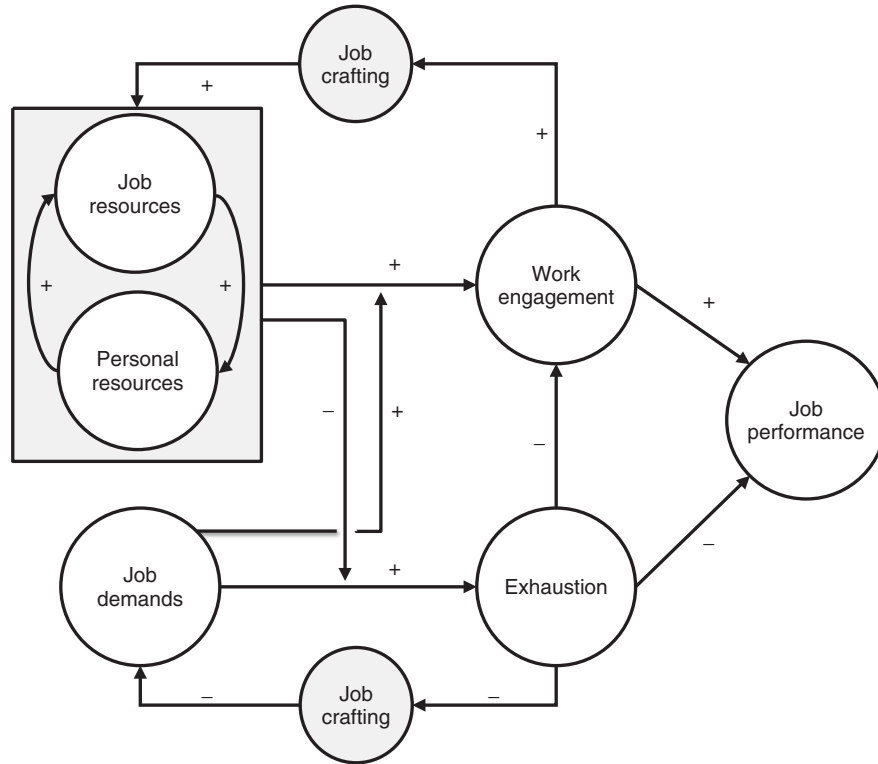
Figure 3.1. The Job Demands–Resources Model.

like the needs for autonomy, relatedness, and competence (Bakker, 2011; Deci & Ryan, 2000; Nahrgang et al., 2011).

A number of studies have supported the dual pathways to employee well-being proposed by JD-R theory, and showed that it can predict important organizational outcomes. Bakker et al. (2003b) applied the JD-R model to call center employees of a Dutch telecom company, and investigated its predictive validity for self-reported absenteeism and turnover intentions. Results of a series of structural equation modeling (SEM) analyses largely supported the dual processes. In the first energy-driven process, job demands (i.e., work pressure, computer problems, emotional demands, and changes in tasks) were the most important predictors of health problems, which, in turn, were related to sickness absence (duration and long-term absence). In the second motivation-driven process, job resources (i.e., social support, supervisory coaching, performance feedback, and time control) were the only predictors of dedication and organizational commitment, which, in turn, were related to turnover intentions.

Hakanen et al. (2006) found comparable results in their study among Finnish teachers. More specifically, they found that burnout mediated the effect of job demands on ill-health, and that work engagement mediated the effect of job resources on organizational commitment. Furthermore, Bakker et al. (2003a) applied the JD-R model to nutrition production employees, and used the model to predict future company-registered absenteeism. Results of SEM analyses showed that job demands were unique predictors of burnout and indirectly of absence *duration*, whereas job resources were unique predictors of organizational commitment, and indirectly of absence *spells*. Finally, Bakker et al. (2004) used the JD-R model to examine the relationship between job characteristics, burnout, and other ratings of performance. They hypothesized and found that job demands (e.g., work pressure and emotional demands) were the most important antecedents of the exhaustion component of burnout, which, in turn, predicted *in-role* performance. In contrast, job resources (e.g., autonomy and social support) were the most important predictors of *extra-role* performance, through their relationship with (dis)engagement. Taken together, these findings support JD-R theory's claim that job demands and job resources initiate two different psychological processes, which eventually affect important organizational outcomes.

Job Demands × Resources Interactions

Job demands and resources initiate different processes, but have also joint effects (see Figure 3.1). The third proposition put forward by JD-R theory is that job demands and resources interact in predicting occupational wellbeing. There are two possible ways in which demands and resources may have a combined effect on wellbeing, and indirectly influence performance. The first interaction is the one where job resources buffer the impact of job demands on strain. Thus, several studies have shown that job resources like social support, autonomy, performance feedback, and opportunities for development can mitigate the impact of job demands (work pressure, emotional demands, etc.) on strain, including burnout (e.g., Bakker et al., 2005; Xanthopoulou et al., 2007b). Employees who have many job resources available can cope better with their daily job demands. The second interaction is the one where job demands amplify the impact of job resources on motivation/engagement. Thus, research has shown that job resources become salient and have the strongest positive impact on work engagement when job demands are high. In particular, when a worker is confronted with challenging job demands, job resources become valuable and foster dedication to the tasks at hand.

Hakanen, Bakker, and Demerouti (2005) tested the latter interaction hypothesis in a sample of Finnish dentists employed in the public sector. It was hypothesized that job resources (e.g., variability in the required professional skills, peer contacts) are most beneficial in maintaining work engagement under conditions of high job demands (e.g., workload, unfavorable physical environment). The dentists were split into two random groups in order to cross-validate the findings. A set of hierarchical regression analyses resulted in 17 out of 40 significant interactions (40%), showing, for example, that variability in professional skills boosted work engagement when qualitative workload was high, and mitigated the negative effect of qualitative workload on work engagement.

Conceptually similar findings have been reported by Bakker et al. (2007). In our study among Finnish teachers working in elementary, secondary, and vocational schools, we found that job resources act as buffers and diminish the negative relationship between pupil misbehavior and work engagement. In addition, we found that job resources particularly influence work engagement when teachers are confronted with high levels of pupil misconduct. A series of moderated structural equation modeling analyses resulted in 14 out of 18 possible two-way interaction effects (78%). In particular, supervisor support, innovativeness, appreciation, and organizational climate were important job resources for teachers that helped them cope with demanding interactions with students.

Finally, in a large study among more than 12,000 employees from different occupational groups, Bakker et al. (2010) found that task enjoyment and organizational commitment were also the result of combinations of many different job demands and job resources. Task enjoyment and commitment were highest when employees were confronted with challenging and stimulating tasks, and had sufficient resources at their disposal (e.g., performance feedback, high-quality relationships with colleagues). In sum, previous research with the JD-R model clearly indicates that job demands and resources interact and have a multiplicative impact on employee wellbeing.

Personal Resources

An important extension of the original JD-R model (Bakker et al., 2004; Demerouti et al., 2001) is the inclusion of personal resources in the model and theory. Personal resources are positive self-evaluations that are linked to resiliency and refer to individuals' sense of their ability to control and impact upon their environment successfully (Hobfoll, Johnson, Ennis,

& Jackson, 2003). It has been argued and shown that such positive self-evaluations predict goal-setting, motivation, performance, job and life satisfaction, and other desirable outcomes (for a review, see Judge, Van Vianen, & De Pater, 2004). The reason for this is that the higher an individual's personal resources, the more positive the person's self-regard and the more goal self-concordance is expected to be experienced (Judge, Bono, Erez, & Locke, 2005). Individuals with goal self-concordance are intrinsically motivated to pursue their goals and as a result they trigger higher performance and satisfaction (see also Luthans & Youssef, 2007).

Xanthopoulou, Bakker, Demerouti, and Schaufeli (2007a) examined the role of three personal resources (self-efficacy, organizational-based self-esteem, and optimism) in predicting work engagement and exhaustion. Results of SEM analyses showed that personal resources did *not* manage to offset the relationship between job demands and exhaustion. In contrast, personal resources were found to partly mediate the relationship between job resources and work engagement, suggesting that job resources foster the development of personal resources. The longitudinal study by Xanthopoulou, Bakker, Demerouti, and Schaufeli (2009) also suggested that personal resources were reciprocal with job resources and work engagement over time. Thus, job resources predicted personal resources and work engagement; and personal resources and work engagement, in turn, predicted job resources (see also Figure 3.1).

To date, there is only limited evidence for the interaction between personal resources and job demands. In a survey study among military chaplains, Tremblay and Messervey (2011) hypothesized that compassion satisfaction could buffer the impact of job demands on job strain (anxiety and depression). Compassion satisfaction was defined as the fulfillment professional caregivers (e.g., social workers, fire fighters, clergy) feel from helping those who have experienced a traumatic event. The results of regression analyses showed that compassion satisfaction buffered the impact of role overload on job strain. Furthermore, in their study among nurses, Bakker and Sanz-Vergel (in press; study 2) tested the boosting effect of personal resources. Specifically, they hypothesized that weekly emotional job demands could facilitate the positive impact of personal resources (self-efficacy and optimism) on weekly work engagement. They asked 63 nurses to fill in a questionnaire at the end of the working week during three consecutive weeks. Results of hierarchical linear modeling showed that emotional job demands strengthened the effect of personal resources

on weekly work engagement—confirming that these demands act as a challenge demand for nurses who particularly enjoy caring for other people.

Reversed Causal Relationships

As already indicated, the relationship between (self-reported and observed) job demands (e.g., workload and emotional demands) and health-related outcomes (e.g., exhaustion) has been observed frequently (see Bakker & Demerouti, 2007; Demerouti et al., 2001; Lee & Ashforth, 1996). Moreover, recent research shows that job resources may have a strong (longitudinal) impact on motivational outcomes, including work engagement (Xanthopoulou et al., 2009). Conversely, some studies have shown that job strain, including burnout, may also have an impact on job demands over time. In their review, Zapf, Dormann, and Frese (1996) identified that 6 out of 16 longitudinal studies showed reversed causal relationships between working conditions and strain. Later studies provide additional evidence for reversed causation, such as between depersonalization and the quality of the doctor–patient relationship (Bakker, Schaufeli, Sixma, Bosveld, & Van Dierendonck, 2000), and between exhaustion and work pressure (Demerouti, Bakker, & Bulters, 2004).

One possible explanation for reversed causal effects is that employees experiencing strain or disengagement show behaviors that place additional demands upon them, like exhausted employees who fall behind with their work (Demerouti et al., 2004) or depersonalized employees evoking more stressful and more difficult interactions with their future clients (e.g., Bakker et al., 2000). Another explanation is that job demands may also be affected by employees' *perceptions* of the working environment (Zapf et al., 1996). For instance, burned-out employees may evaluate job demands more critically and complain more often about their workload, thus creating a negative work climate (Bakker & Schaufeli, 2000). In support of this, we found that job demands were related to burnout, and that burnout was related to job demands over time (Demerouti, Le Blanc, Bakker, Schaufeli, & Hox, 2009).

Recent studies have also suggested reversed causal relationships between job (and personal) resources and employee psychological wellbeing. For instance, De Lange, Taris, Kompier, Houtman, and Bongers (2005) found positive effects of mental health on supervisory support. Furthermore, Wong, Hui, and Law (1998) reported that job satisfaction was positively related to several organizational resources (e.g., autonomy, skill variety, and feedback) assessed 2 years later. In a similar vein, Salanova, Bakker, and Llorens

(2006), in their 1-year follow-up study among Spanish teachers, found that work-related flow experiences were associated with organizational resources and self-efficacy over time.

Taken together, these findings suggest that work engagement may facilitate the mobilization of job resources. This is consistent with the notion that in the absence of threats, people are motivated to create resources (Hobfoll, 2002). Engaged employees, who are intrinsically motivated to fulfill their work objectives, will activate or create job resources (e.g., ask colleagues for help) to use as means to achieve these objectives. Furthermore, vigorous, dedicated, and absorbed employees are more likely to fulfill their work goals (Demerouti & Cropanzano, 2010). Consequently, this will generate positive feedback, more rewards, and a more positive work climate in terms of relations with supervisors and colleagues. Similarly, Fredrickson (2003; Vacharkulksemsuk & Fredrickson, 2013) proposes that positive affective states have the ability to broaden employees' momentary thought–action repertoires and build enduring personal, social, and psychological resources. For instance, work engagement, as a positive motivational-affective state, broadens by creating the urge to expand the self through learning and goal fulfillment, and as such builds resources. In support of this, Xanthopoulou et al. (2009) found that not only were job resources predictors of work engagement but also work engagement was positively related to job resources over time.

Thus, rather than being deterministic, JD-R theory recognizes and integrates the fact that individuals' levels of exhaustion and work engagement may also influence their job demands and resources, which makes the JD-R theory a dynamic theory (see Figure 3.1). The question is, however, how these reversed relationships develop. This will be handled in the next section, where we discuss the final building block of JD-R theory.

Job Crafting

It is clear that the availability of well-designed jobs and working conditions facilitates employee motivation and reduces stress, but what if these favorable working conditions are not available? Employees may actively change the design of their jobs by choosing tasks, negotiating different job content, and assigning meaning to their tasks or jobs (Parker & Ohly, 2008). This process of employees shaping their jobs has been referred to as "job crafting" (Wrzesniewski & Dutton, 2001). Job crafting is defined as the physical and cognitive changes individuals make in their task or relational boundaries. Physical changes refer to changes in the form, scope, or number

of job tasks, whereas cognitive changes refer to changing how one sees the job. Wrzesniewski and Dutton note that job crafting is not inherently "good" or "bad" for an organization. Its effect depends on the situation.

According to Wrzesniewski and Dutton (2001), the motivation for job crafting arises from three individual needs. First, employees engage in job crafting because they have the need to take control over certain aspects of their work in order to avoid negative consequences such as alienation from work. Second, employees are motivated to change aspects of their work in order to enable a more positive sense of self to be expressed and confirmed by others. Third, job crafting allows employees to fulfill their basic human need for connection to others. In addition, Petrou, Demerouti, Peeters, Schaufeli, and Hetland (2012) suggested that individuals craft their job in order to create conditions in which they can work healthily and be well motivated.

Tims, Bakker, and Derks (2012) recently defined job crafting as the changes employees may make regarding their *job demands* and *job resources*. This conceptualization takes JD-R theory as a starting point. According to Tims and her colleagues, job crafting can take the form of four different types of behaviors: (a) increasing structural job resources; (b) increasing social job resources; (c) increasing challenging job demands; and (d) decreasing hindrance job demands. The study found evidence for four proposed job crafting dimensions, which could be reliably measured with 21 items. In terms of convergent validity, job crafting was positively correlated with the "active" construct of personal initiative, and negatively with the "inactive" construct cynicism. In support of criterion validity of the job crafting conceptualization and measurement, results indicated that self-reports of job crafting correlated positively with colleague ratings of work engagement, employability, and performance. Finally, self-rated job crafting behaviors correlated positively with peer-rated job crafting behaviors, which indicates that job crafting represents behaviors that others can also observe.

In an attempt to integrate job crafting in the JD-R theory, Tims, Bakker, and Derks (2013) hypothesized that job crafting would predict future job demands and job resources and indirectly have a positive impact on work engagement and job satisfaction. Data was collected among employees working in a chemical plant at three time points with 1 month in between the measurement waves. The results of SEM analyses showed that employees who crafted their job resources in the first month of the study showed an increase in their structural and social resources over the course of the study (2 months). This increase in job resources was related to increased work

engagement and job satisfaction. Crafting job demands did not result in a change in job demands, but results revealed direct effects of crafting challenging demands on increases in wellbeing. In a similar vein, Petrou et al. (2012) found in their diary study that on days that work pressure and autonomy were both high (i.e., active jobs), employees increased their resources more and lowered their demands less. Interestingly, it was shown that the more employees sought job resources and challenges on a specific day, the more engaged they were in their job. In contrast, the more employees simplified their work on a specific day, the less engagement they experienced on that day. Thus, job crafting, or the bottom-up adjustments of demands and resources, seems to play a substantial role in the mechanisms suggested by the JD-R theory.
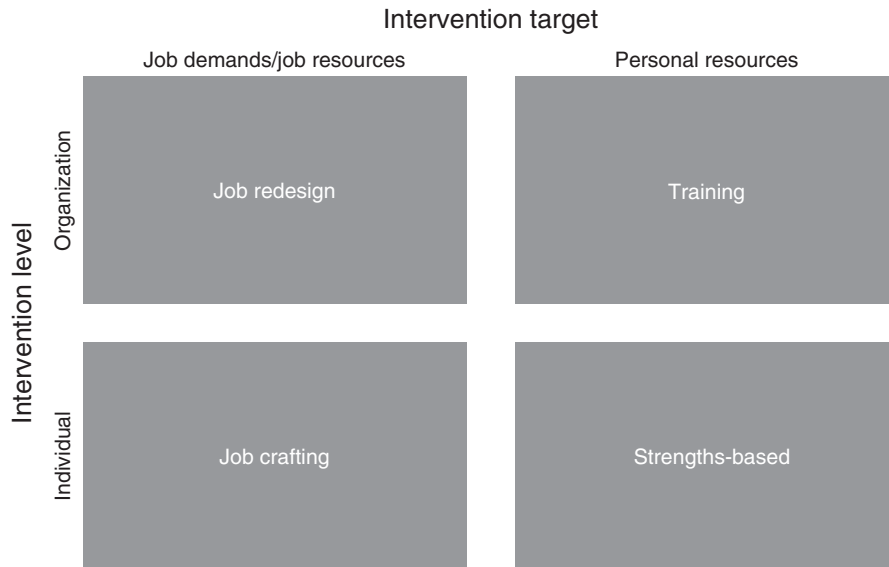
JD-R Interventions

JD-R studies have consistently shown that employees achieve the best job performance in challenging, resourceful work environments, since such environments facilitate their work engagement. This implies that organizations should offer their employees sufficient job challenges, and job resources, including feedback, social support, and skill variety. Research indeed suggests that management can influence employees' job demands and resources (Nielsen, Randall, Yarker, & Brenner, 2008), and may indirectly influence employee engagement and performance.

However, it may be equally important that employees mobilize their own job resources. Managers are not always available for feedback, and organizations that are confronted with economic turmoil may set other priorities. Under such conditions, it may be particularly important for employees to mobilize their own resources, and to show proactive behavior in the form of job crafting.

In addition, JD-R theory acknowledges the importance of the person. Organizations can decide to invest in training their employees so that they are better able to deal with the job demands and to develop themselves during work. Organization-driven interventions aiming at increasing individual employees' personal resources can take the form of in-company training, while individual-driven interventions can take the form of capitalizing on one's strengths. In this chapter, we briefly discuss the four possible JD-R interventions displayed in Figure 3.2, namely (a) job redesign; (b) job crafting; (c) training; and (d) strengths-based intervention. These interventions can be organized on two dimensions: (1) *intervention level*:

Intervention target

Figure 3.2. Interventions on the Basis of JD-R Theory Classified in Terms of Intervention Target and Level.

individual versus organization, and (2) *intervention target*: the work environment (job demands and resources) versus the individual (personal resources).

Job Redesign

Job redesign is a structural intervention at the organizational level that aims to change the source of employee wellbeing—their job demands and job resources. Job design describes "how jobs, tasks, and roles are structured, enacted, and modified, as well as the impact of these structures, enactments, and modifications on individual, group, and organizational outcomes" (Grant & Parker, 2009, p. 319). Job design usually represents a top-down process in which organizations create jobs and form the conditions under which the job holders/incumbents execute their tasks. Job redesign is usually seen as the process through which the organization or supervisor changes something in the job, tasks, or the conditions of the individual. An example of a traditional work redesign effort is the increase of individual and team autonomy in the production process. A more contemporary example concerns the introduction of project work where individuals within and outside an organization work interdependently on the development of a product—often under time pressure. In each case, the structure and content of the work can be redesigned by the organization or by employees

themselves, with the ultimate goal to improve outcomes such as employee wellbeing, work engagement, and job performance.

Note that it is also possible to ask employees to fill in an electronic version of the JD-R questionnaire and to offer them online and personalized feedback on their computer or smartphone about their most important job demands and resources (Bakker, Oerlemans, & Ten Brummelhuis, 2012). The feedback may include histograms of and written information about the specific demands and resources identified as important for engagement in the organization under study. The personal JD-R profile can be used as input for interviews with human resources managers and personal coaches. In this way, it becomes also possible to optimize the working environment for individual employees.

Job Crafting Interventions

In contrast with traditional job redesign, job crafting is an individual-level intervention that is usually initiated by the individual employee. Employees may actively change the design of their jobs by choosing tasks, negotiating different job content, and assigning meaning to their tasks or jobs (Parker & Ohly, 2008). From a JD-R perspective, they may proactively change their own job demands and job resources. Organizations can stimulate job crafting behavior that is beneficial for both the employees and the organizations by showing individuals how they can craft their job. Van den Heuvel, Demerouti, and Peeters (2012) developed and tested such an intervention among police officers. Through various explanations and exercises during workshops, employees got to know the concept of job crafting and were instructed to develop their own personal crafting plan (PCP). The PCP consisted of specific crafting actions that the participants had to undertake. During a period of four consecutive weeks, participants increased their job resources, increased their challenge demands, and decreased their hindrance job demands. Participants also exchanged their crafting experiences during a reflection meeting where they discussed successes, problems, and solutions. The intervention was found to increase two job resources (contact with the supervisor and opportunities for professional development), one personal resource (self-efficacy), and wellbeing as participants reported more positive emotions and less negative emotions.

Bakker et al. (2012) suggested that a job crafting intervention may also use the Internet to instruct participating employees, and to follow them on a weekly basis (e.g., 6 weeks). At the start of each week, participants can

be instructed through email to align their work with their skills and needs by changing the work content or their work environment. Participants can also be provided with examples, such as changing the way they work, when they work, and with whom they work (clients, colleagues); changing the frequency of feedback and coaching; simplifying their work versus looking for more challenges; and carrying out additional tasks. The instruction could additionally provide clear examples of employees in certain jobs who successfully mobilized their job resources or increased/reduced their job demands. To facilitate the job crafting behaviors, participants can be asked to list up to five aspects of their work they would like to change during the upcoming week. In addition, they can be asked—for example, via email or smartphone, or initiated by a personal coach—to indicate for each activity how and when they intend to engage in job crafting. Such implementation intentions will facilitate the success of the job crafting intervention.

Training

Training and development of employees is one of the cornerstones of human resources management, and can be seen as an organizational level intervention. Through training, employees may acquire new skills, technical knowledge, and problem-solving abilities. Whereas improved knowledge and skills may facilitate personal resources such as self-efficacy, resilience, and optimism, training may also directly focus on personal resources. Peterson, Luthans, Avolio, Walumbwa, and Zhang (2011) have shown that positive change in personal resources (they call this "psychological capital") is related to positive change in supervisor-rated performance and financial performance (i.e., individual sales revenue). Demerouti, van Eeuwijk, Snelder, and Wild (2011) showed that such interventions not only increase self-reported personal resources; external raters can also observe increases in personal resources. Thus, personal resources are malleable and can be increased in order to improve work engagement and performance.

Luthans, Avey, Avolio, and Peterson (2010) assigned participants randomly to treatment or control groups. The treatment groups received a 2-hour training intervention conducted by training facilitators that utilized a series of exercises and group discussions designed to impact the participants' level of efficacy, hope, optimism, and resilience. In the intervention training, the facilitators used a series of writing, discussion, and reflective exercises specific to each of the four personal resources. Examples of the exercises used included one that focused on broadening the hope-oriented

self-regulating capacity and pathways thinking toward a specific goal. First, each participant was asked to consider and then write down personal goals. The facilitator led participants through a series of techniques to set and phrase goals to increase agentic capacity (Bandura, 2008). This included parceling large goals into manageable units, thereby also increasing efficacy over smaller subgoals. Next, participants were asked to considering multiple pathways to accomplishing each goal and to share those pathways in small discussion groups within the intervention session. Thus, the capacity for pathway generation was expected to be increased through vicarious learning and in turn to enhance participants' level of efficacy in utilizing the hope application of deriving multiple pathways to accomplish a given goal. In addition, by increasing their efficacy in accomplishing the goal, the participants were expected to increase their positive expectations of goal accomplishment (i.e., their optimism). For more details, see Luthans et al. (2010).

Strengths-Based Interventions

Work engagement is most probably dependent on the match between individual strengths possessed by employees, and the degree to which they can draw from their strengths in their daily work activities. Individual strengths can be defined as positive traits reflected in thoughts, feelings, and behaviors (Park, Peterson, & Seligman, 2004). Examples are curiosity, bravery, kindness, and gratitude. It has been argued that working with one's strengths is fulfilling and engaging, and induces a feeling of acting in an authentic manner and being true to oneself (Peterson & Seligman, 2004). Employees who can use their strengths at work are expected to be self-efficacious. This intervention can thus be seen as an individual-level intervention aimed at increasing personal resources.

Although strengths-based interventions within the context of work have—to the best of our knowledge—not yet been scientifically evaluated, research on wellbeing in general has produced some promising findings. For example, in one strength-based intervention, participants were asked to first identify their top individual strengths. Subsequently, they were encouraged to use one of their strengths in a new or different way every day for at least one week (Seligman, Steen, Park, & Peterson, 2005). Participants were randomly assigned to an experimental or control group, and were followed over time. Results showed that this intervention led to significant increases in happiness and significant reductions of depressive symptoms at 1 week, 1 month, 3 months, and 6 months follow-up.

There may be various ways to "translate" strengths-based interventions to a workplace context. One possibility is to provide individual feedback to employees (e.g., through online modules) about their most important strengths. Thereafter, an option would be to give employees more insight with regard to the frequency with which they use their top character strengths on a daily basis while performing work-related activities (e.g., through keeping a work-related diary). If it turns out that employees use their strengths insufficiently, a next step would be to provide employees with specific pathways that lead them to use their strengths within the work context in a new way. This may lead employees to (re)consider how to use their strengths during specific types of job-related activities, which, in turn, may enhance their levels of personal resources and work engagement.

Conclusion

The present chapter introduced job demands–resources theory, which is an extension of the job demands–resources model. Overcoming the restricted, static, and one-sided early models of stress and motivation, JD-R theory suggests that work characteristics can be organized in two categories: job demands and job resources. These two categories of work characteristics can be found in virtually every job and are therefore important because they are initiators of two different processes: the health impairment and motivational process. Demands and resources not only have unique effects on employee health and motivation, they also have joint (interactive) effects on employee wellbeing. Rather than being mechanistic, the model suggests that personal resources are also important predictors of motivation, and can buffer the unfavorable effects of job demands.

In addition, JD-R theory proposes that work characteristics and employee health and motivation influence each other mutually over time. Thus, employee health and motivation also change the work environment, which underscores the dynamic nature of the issue of work environment and wellbeing relationships. Finally, JD-R theory also explains the way that these reversed effects occur. Job crafting or individual adjustment of the demands and resources seems to explain how employees change their environment such that they can make it more engaging and less exhausting. JD-R theory can be used to inform interventions driven by the individual or the organization, and these interventions can target personal resources, or job demands and resources. We hope that JD-R theory will be used to guide

future research and practice such that employees can work in healthier, more engaging, and more productive working environments.

References

Alarcon, G. M. (2011). A meta-analysis of burnout with job demands, resources, and attitudes. *Journal of Vocational Behavior*, *79*, 549–562.

Ambrose, M. L., & Kulik, C. T. (1999). Old friends, new faces: Motivation in the 1990s. *Journal of Management*, *25*, 231–292.

Bakker, A. B. (2011). An evidence-based model of work engagement. *Current Directions in Psychological Science*, *20*, 265–269.

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, *22*, 309–328.

Bakker, A. B., Demerouti, E., De Boer, E., & Schaufeli, W. B. (2003a). Job demands and job resources as predictors of absence duration and frequency. *Journal of Vocational Behavior*, *62*, 341–356.

Bakker, A. B., Demerouti, E., & Euwema, M. C. (2005). Job resources buffer the impact of job demands on burnout. *Journal of Occupational Health Psychology*, *10*, 170–180.

Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2003b). Dual processes at work in a call centre: An application of the Job Demands–Resources model. *European Journal of Work and Organizational Psychology*, *12*, 393–417.

Bakker, A. B., Demerouti, E., & Verbeke, W. (2004). Using the Job Demands–Resources model to predict burnout and performance. *Human Resource Management*, *43*, 83–104.

Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. *Journal of Educational Psychology*, *99* , 274–284.

Bakker, A. B., Oerlemans, W., & Ten Brummelhuis, L. L. (2012). Becoming fully engaged in the workplace: What individuals and organizations can do to foster work engagement. In R. Burke & C. Cooper (Eds.), *The fulfilling workplace: The organization's role in achieving individual and organizational health*. Farnham: Gower.

Bakker, A. B., & Sanz-Vergel, A. I. (in press). Weekly work engagement and flourishing: The role of hindrance and challenge demands. *Journal of Vocational Behavior*.

Bakker, A. B., & Schaufeli, W. B. (2000). Burnout contagion processes among teachers. *Journal of Applied Social Psychology*, *30*, 2289–2308.

Bakker, A. B., Schaufeli, W. B., Sixma, H., Bosveld, W., & Van Dierendonck, D. (2000). Patient demands, lack of reciprocity, and burnout: A five-year longitudinal study among general practitioners. *Journal of Organizational Behavior*, *21*, 425–441.

Bakker, A. B., Van Emmerik, H., & Van Riet, P. (2008). How job demands, resources, and burnout predict objective performance: A constructive replication. *Anxiety, Stress, and Coping*, *21*, 309–324.

Bakker, A. B., Van Veldhoven, M. J. P. M., & Xanthopoulou, D. (2010). Beyond the Demand-Control model: Thriving on high job demands and resources. *Journal of Personnel Psychology*, *9*, 3–16.

Bandura, A. (2008). An agentic perspective on positive psychology. In S. J. Lopez (Ed.), *Positive psychology* (Vol. 1, pp. 167–196). Westport, CT: Greenwood.

Behson, S. J., Eddy, E. R., & Lorenzet, S. J. (2000). The importance of the critical psychological states in the job characteristics model: A meta-analytic and structural equations modeling examination. *Current Research in Social Psychology*, *5*, 170–189.

Carayon, P. (1993). A longitudinal test of Karasek's job strain model among office workers. *Work and Stress*, *7*, 299–314.

Clausen, T., Nielsen, K., Gomes Carneiro, I., & Borg, V. (2012). Job demands, job resources and long-term sickness absence in the Danish eldercare services: A prospective analysis of register-based outcomes. *Journal of Advanced Nursing*, *68*, 127–136.

Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *Journal of Applied Psychology*, *95*, 834–848.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227–268.

De Jonge, J., Bosma, H., Peter, R., & Siegrist, J. (2000). Job strain, effort-reward imbalance and employee well-being: A large-scale cross-sectional study. *Social Science & Medicine*, *50*, 1317–1327.

De Jonge, J., Janssen, P. P. M., & Breukelen, J. P. van (1996). Testing the Demand–Control–Support model among health care professionals: A structural equations approach. *Work and Stress*, *10*, 209–224.

De Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2003). "The *very* best of the millennium": Longitudinal research and the Demand-Control-(Support) model. *Journal of Occupational Health Psychology*, *8*, 282–305.

De Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2005). Different mechanisms to explain the reversed effects of mental health on work characteristics. *Scandinavian Journal of Work, Environment, and Health*, *31*, 3–14.

Demerouti, E., & Bakker, A. B. (2011). The Job Demands–Resources model: Challenges for future research. *South African Journal of Industrial Psychology*, *37*, 1–9.

Demerouti, E., Bakker, A. B., & Bulters, A. J. (2004). The loss spiral of work pressure, work-home interference and exhaustion: Reciprocal relations in a three-wave study. *Journal of Vocational Behavior*, *64*, 131–149.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*, 499–512.

Demerouti, E., & Cropanzano, R. (2010). From thought to action: Employee work engagement and job performance. In A. B. Bakker & M. P. Leiter (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 147–163). New York: Psychology Press.

Demerouti, E., Derks, D., Ten Brummelhuis, L. L., & Bakker, A. B. (in press). New ways of working: Impact on working conditions, work-family balance, and well-being. In P. Hoonakker & C. Karunka (Eds.), *Acceleration: Information technology and quality of working life*. Berlin: Springer Science.

Demerouti, E., Le Blanc, P. M., Bakker, A. B., Schaufeli, W. B., & Hox, J. (2009). Present but sick: A three-wave study on job demands, presenteeism and burnout. *Career Development International*, *14*, 50–68.

Demerouti, E., Van Eeuwijk, E., Snelder, M., & Wild, U. (2011). Assessing the effects of a "personal effectiveness" training on psychological capital, assertiveness and self-awareness using self-other agreement. *Career Development International*, *16*, 60–81.

Fredrickson, B. L. (2003). Positive emotions and upward spirals in organizations. In K. Cameron, J. Dutton, & R. Quinn (Eds.), *Positive organizational scholarship* (pp. 163–175). San Francisco: Berrett-Koehler.

Fried, Y., & Ferris, G. R. (1987). The validity of the Job Characteristics Model: A review and meta-analysis. *Personnel Psychology*, *40*, 287–322.

Graen, G. B., Scandura, T. A., & Graen, M. (1986). A field experimental test of the moderating effects of growth need strength on productivity. *Journal of Applied Psychology*, *71*, 484–491.

Grant, A. M., Fried, Y., & Juillerat, T. (2010). Work matters: Job design in classic and contemporary perspectives. In S. Zedeck (Ed.), *APA handbook of industrial and organizational psychology* (Vol. 1; pp. 417–453). Washington, DC: American Psychological Association.

Grant, A. M., & Parker, S. K. (2009). Redesigning work design theories: The rise of relational and proactive perspectives. *Academy of Management Annals*, *3*, 273–331.

Hackman, J. R., & Lawler, E. E. (1971). Employee reactions to job characteristics. *Journal of Applied Psychology*, *55*, 259–286.

Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior & Human Decision Processes*, *16*, 250–279.

Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.

Hakanen, J. J., Bakker, A. B., & Demerouti, E. (2005). How dentists cope with their job demands and stay engaged: The moderating role of job resources. *European Journal of Oral Sciences*, *113*, 479–487.

Hakanen, J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *Journal of School Psychology*, *43*, 495–513.

Halbesleben, J. R. B. (2010). A meta-analysis of work engagement: Relationships with burnout, demands, resources and consequences. In A. B. Bakker

& M. P. Leiter (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 102–117). New York: Psychology Press.

Herzberg, F. (1966). *Work and the nature of man*. Cleveland, OH: Holland.

Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The motivation to work*. New York: Wiley.

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology*, *6*, 307–324.

Hobfoll, S. E., Johnson, R. J., Ennis, N., & Jackson, A. P. (2003). Resource loss, resource gain, and emotional outcomes among inner city women. *Journal of Personality and Social Psychology*, *84*, 632–643.

Johnson, J. V., & Hall, E. M. (1988). Job strain, work place social support and cardiovascular disease: A cross-sectional study of a random sample of the Swedish working population. *American Journal of Public Health*, *78*, 1336–1342.

Judge, T. A., Bono, J. E., Erez, A., & Locke, E. A. (2005). Core self-evaluations and job and life satisfaction: The role of self-concordance and goal attainment. *Journal of Applied Psychology*, *90*, 257–268.

Judge, T. A., Van Vianen, A. E. M., & De Pater, I. (2004). Emotional stability, core self-evaluations, and job outcomes: A review of the evidence and an agenda for future research. *Human Performance*, *17*, 325–346.

Karasek, R. A. (1979). Job demands, decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, *24*, 285–308.

Karasek, R. A., & Theorell, T. (1990). *Healthy work*. New York: Basic Books.

Lee, R. T., & Ashforth, B. E. (1996). A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology*, *81*, 123–133.

Leiter, M. P. (1993). Burnout as a developmental process: Consideration of models. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds.), *Professional burnout: Recent developments in theory and research* (pp. 237–250). Washington, DC: Taylor & Francis.

Lewig, K., Xanthopoulou, D., Bakker, A. B., Dollard, M., & Metzer, J. (2007). Burnout and connectedness among Australian volunteers: A test of the Job Demands-Resources model. *Journal of Vocational Behavior*, *71*, 429–445.

Luthans, F., Avey, J. B., Avolio, B. J., & Peterson, S. J. (2010). The development and resulting performance impact of positive psychological capital. *Human Resource Development Quarterly*, *21*, 41–67.

Luthans, F., & Youssef, C. M. (2007). Emerging positive organizational behavior. *Journal of Management*, *33*, 321–349.

Meijman, T. F., & Mulder, G. (1998). Psychological aspects of workload. In P. J. Drenth, H. Thierry, & C. J. de Wolff (Eds.), *Handbook of work and organizational psychology* (2nd ed.; pp. 5–33). Hove, U.K.: Erlbaum.

Nahrgang, J. D., Morgeson, F. P., & Hofmann, D. A. (2011). Safety at work: A meta-analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. *Journal of Applied Psychology*, *96*, 71–94.

Nielsen, K., Randall, R., Yarker, J., & Brenner, S. O. (2008). The effects of transformational leadership on followers' perceived work characteristics and psychological well-being: A longitudinal study. *Work & Stress*, *22*, 16–32.

Park, N., Peterson, C., & Seligman, M. E. P. (2004). Strengths of character and well-being. *Journal of Social and Clinical Psychology*, *23*, 603–619.

Parker, S. K., & Ohly, S. (2008). Designing motivating jobs. In R. Kanfer, G. Chen, & R. Pritchard (Eds.), *Work motivation: Past, present, and future*. SIOP Organizational Frontiers Series. London: Psychology Press.

Parker, S. K., & Wall, T. D. (1998). *Job and work design: Organizing work to promote well-being and effectiveness*. San Francisco, CA: Sage.

Parker, S. K., Wall, T. D., & Cordery, J. (2001). Future work design research and practice: Towards an elaborated model of work design. *Journal of Occupational and Organizational Psychology*, *74*, 413–440.

Peterson, C., & Seligman, M. E. P. (2004). *Character strengths and virtues: A handbook and classification*. Washington, DC: American Psychological Association.

Peterson, S. J., Luthans, F., Avolio, B. J., Walumbwa, F. O., & Zhang, Z. (2011). Psychological capital and employee performance: A latent growth modeling approach. *Personnel Psychology*, *64*, 427–450.

Petrou, P., Demerouti, E., Peeters, M. C. W., Schaufeli, W. B., & Hetland, J. (2012). Crafting a job on a daily basis: Contextual correlates and the link to work engagement. *Journal of Organizational Behavior*, *33*, 1020–1141.

Renn, R. W., & Vandenberg, R. J. (1995). The critical psychological states: An underrepresented component in job characteristics model research. *Journal of Management*, *21*, 279–303.

Roberts K. H., & Glick, W. (1981). The job characteristics approach to task design: A critical review. *Journal of Applied Psychology*, *66*, 193–217.

Rousseau, D. M. (2005). *I-deals: Idiosyncratic deals employees bargain for themselves*. New York: M. E. Sharpe.

Salanova, M., Bakker, A. B., & Llorens, S. (2006). Flow at work: Evidence for an upward spiral of personal and organizational resources. *Journal of Happiness Studies*, *7*, 1–22.

Schaufeli, W. B., Bakker, A. B., & Van Rhenen, W. (2009). How changes in job demands and resources predict burnout, work engagement, and sickness absenteeism. *Journal of Organizational Behavior*, *30*, 893–917.

Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist*, *60*, 410–421.

Siegrist, J. (1996). Adverse health effects of high effort-low reward conditions. *Journal of Occupational Health Psychology*, *1*, 27–41.

Siegrist, J. (2008). Effort-reward imbalance and health in a globalized economy. *Scandinavian Journal of Work, Environment & Health*, *6*, 163–168.

Taris, T. W. (2006). Bricks without clay: On urban myths in occupational health psychology. *Work & Stress*, *20*, 99–104.

Taris, T. W., Kompier, M. J., De Lange, A. H., Schaufeli, W. B., & Schreurs, P. J. G. (2003). Learning new behaviour patterns: A longitudinal test of

Karasek's active learning hypothesis among Dutch teachers. *Work & Stress*, *17*, 1–20.

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behavior*, *80*, 173–186.

Tims, M., Bakker, A. B., & Derks, D. (2013). The impact of job crafting on job demands, job resources, and well-being. *Journal of Occupational Health Psychology*, *18*, 230–240.

Tremblay, M. A., & Messervey, D. (2011). The Job Demands-Resources model: Further evidence for the buffering effect of personal resources. *South African Journal of Industrial Psychology*, *37*, 1–10.

Tsutsumi, A., & Kawakami, N. (2004). A review of empirical studies on the model of effort–reward imbalance at work: Reducing occupational stress by implementing a new theory. *Social Science & Medicine*, *59*, 2335–2359.

Vacharkulksemsuk, T., & Fredrickson, B. L. (2013). Looking back and glimpsing forward: The broaden-and-build theory of positive emotions as applied to organizations. In A. B. Bakker (Ed.), *Advances in positive organizational psychology* (Vol. 1, pp. 45–60). Bingley: Emerald.

Van den Heuvel, M., Demerouti, E., & Peeters, M. (2012). Succesvol job craften door middel van een groepstraining [Successful job crafting through group training]. In J. de Jonge, M. Peeters, S. Sjollema, & H. de Zeeuw (Eds.), *Scherp in werk: 5 routes naar optimale inzetbaarheid* (pp. 27–49). Assen: Koninklijke van Gorcum.

Van der Doef, M., & Maes, S. (1999). The Job Demand-Control(-Support) Model and psychological well-being: A review of 20 years of empirical research. *Work and Stress*, *13*, 87–114.

Walster, E., Walster, G. W., & Berscheid, E. (1978). *Equity: Theory and research*. Boston: Allyn & Bacon.

Wong, C. S., Hui, C., & Law, K. S. (1998). A longitudinal study of the job perception-job satisfaction relationship: A test of the three alternative specifications. *Journal of Occupational and Organizational Psychology*, *71*, 127–146.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, *26*, 179–201.

Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2009). Reciprocal relationships between job resources, personal resources, and work engagement. *Journal of Vocational Behavior*, *74*, 235–244.

Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2007a). The role of personal resources in the job demands-resources model. *International Journal of Stress Management*, *14*, 121–141.

Xanthopoulou, D., Bakker, A. B., Dollard, M. F., Demerouti, E., Schaufeli, W. B., Taris, T. W., & Schreurs, P. J. G. (2007b). When do job demands particularly predict burnout? The moderating role of job resources. *Journal of Managerial Psychology*, *22*, 766–786.

Zapf, D., Dormann, C., & Frese, M. (1996). Longitudinal studies in organizational stress research: A review of the literature with reference to methodological issues. *Journal of Occupational Health Psychology*, *1*, 145–169.