USING THE JOB DEMANDS-RESOURCES MODEL TO PREDICT BURNOUT AND PERFORMANCE

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The job demands-resources (JD-R) model was used to examine the relationship between job characteristics, burnout, and (other-ratings of) performance (N = 146). We hypothesized that job demands (e.g., work pressure and emotional demands) would be the most important antecedents of the exhaustion component of burnout, which, in turn, would predict in-role performance (hypothesis 1). In contrast, job resources (e.g., autonomy and social support) were hypothesized to be the most important predictors of extra-role performance, through their relationship with the disengagement component of burnout (hypothesis 2). In addition, we predicted that job resources would buffer the relationship between job demands and exhaustion (hypothesis 3), and that exhaustion would be positively related to disengagement (hypothesis 4). The results of structural equation modeling analyses provided strong support for hypotheses 1, 2, and 4, but rejected hypothesis 3. These findings support the JD-R model's claim that job demands and job resources initiate two psychological processes, which eventually affect organizational outcomes. © 2004 Wiley Periodicals, Inc.

Introduction

Although job burnout is known to negatively affect job satisfaction and organizational commitment, and creates such undesired behaviors as personnel turnover and absenteeism (see Lee & Ashforth, 1996, for an overview), its relationship with an organization's most important outcome—namely, job performance—has hardly received any research attention. In fact, in Lee and Ashforth's meta-analysis, the relationship between burnout and performance was not even mentioned. In addition, the few studies reported in the literature thus far have shown inconsistent relationships between burnout and performance, with some studies showing the expected negative relationships (e.g., Bhagat, Allie, & Ford, 1995; Parker & Kulik, 1995; Wright & Cropanzano, 1998), and others showing zero or positive relationships (e.g., Keijsers, Schaufeli, Le Blanc, Zwerts, & Reis-Miranda, 1995; Lazaro, Shinn, & Robinson, 1985; Randall & Scott, 1988). One of the reasons for these mixed findings may be that several studies only examined the relationship between performance and one dimension of burnout—exhaustion (e.g.,

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Wright & Cropanzano, 1998). In addition, the majority of studies used self-reports and did not distinguish between two types of performance: in-role and extra-role performance.

The aim of the current study is to investigate how burnout may be related to other-ratings of performance by using a theoretical model that incorporates the core dimensions of burnout and by employing adequate measures to capture in-role and extra-role performance. We built upon the job demands-resources model of burnout (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), which delineates how the core burnout dimensions, exhaustion and disengagement, both have different etiologies in organizational environments, and may subsequently have different effects on in-role and extra-role performance.

Defining and Measuring Job Burnout

Burnout is a work-related stress syndrome that was originally observed among those who do "people work" (Maslach & Jackson, 1986). However, research of the past decade has shown that the core dimensions of burnout—*exhaustion* and cynicism or disengagement from work—can be observed in virtually any occupational group (Bakker, Demerouti, & Schaufeli, 2002; Demerouti et al., 2001; Leiter & Schaufeli, 1996). Demerouti, Bakker, Vardakou, and Kantas (2003) have defined exhaustion as an extreme form of fatigue as a consequence of prolonged and intense physical, affective, and cognitive strain caused by prolonged exposure to specific working conditions (or stressors; cf. Aronson, Pines, & Kafry, 1983; Lee & Ashforth, 1993; Shirom, 1989). Disengagement refers to distancing oneself from one's work, work objects (e.g., computers, recipients), or work content (e.g., software programming, providing services). It represents an extensive and intensive reaction in terms of an emotional, cognitive, and behavioral rejection of the job and it delineates an occupational disillusionment (cf. Freudenberger, 1974).

The third classical burnout component, reduced personal accomplishment (Maslach & Jackson, 1986), is excluded from our definition of burnout for several reasons. First,

there is accumulating empirical evidence that exhaustion and cynicism (disengagement) constitute the core of burnout, whereas reduced personal accomplishment plays a far less prominent role (Maslach, Schaufeli, & Leiter, 2001; Shirom, 2002). Personal accomplishment has weak relationships with the two other components of burnout as well as with hypothesized antecedents and outcomes (for a meta-analysis, see Lee & Ashforth, 1996). This supports the notion that emotional exhaustion and disengagement constitute a syndrome that is only loosely related to personal accomplishment (see also, Schaufeli, Bakker, Hoogduin, Schaap, & Kladler, 2001). Second, Leiter (1993) has argued and shown that emotional exhaustion leads to cynicism/disengagement, whereas feelings of reduced personal accomplishment develop independently. This is another indication of the exceptional status of this particular burnout dimension. Finally, it has been suggested that personal accomplishment reflects an individual difference characteristic similar to self-efficacy (Cordes & Dougherty, 1993).

Although the Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1996) is the most often used instrument to assess burnout, in the present study, we applied an alternative measure of burnout that can be used among occupations within and outside human service professions. This instrument—called the Oldenburg Burnout Inventory (OLBI; Demerouti et al., 2001, 2003)—conceives burnout as a syndrome of work-related negative experiences, including feelings of *exhaustion* and *disengagement from work*. The reason why we chose to employ this instrument is the distinctive feature of the OLBI compared to the MBI to include both negatively and positively framed items. Such a procedure is recommended by conventional psychometric standards and has a higher probability to avoid artifacts due to acquiescence tendencies.

Burnout and Performance

Employees normally engage in two sorts of performances: they accomplish *in-role* and *extra-role* performance. In-role performance

is defined as those officially required outcomes and behaviors that directly serve the goals of the organization (Motowidlo & Van Scotter, 1994). Among other things, in-role performance includes meeting organizational objectives and effective functioning (Behrman & Perreault, 1984). In addition, employees display extra-role activities (Morrison, 1994). Extra-role performance is defined as discretionary behaviors on the part of an employee that are believed to directly promote the effective functioning of an organization, without necessarily directly influencing a person's target productivity (Podsakoff & MacKenzie, 1994). Examples are the willingness to help colleagues who have heavy workloads or the avoidance of problems with colleagues (this is also known as a specific form of organizational citizenship behavior; Organ & Paine, 1999).

A generally accepted notion in work psychology is that job stressors tend to reduce the individual's capacity to exert control over their work environment, which, in turn, is supposed to adversely affect an individual's ability to function in an efficient way (Fried, Ben-David, Tiegs, Avital, & Yeverechyahu, 1998; McGrath, 1976). While plausible, this notion has received little empirical support. The apparent inconsistencies in the obtained associations between stressors and job performance have led researchers to search for moderators of these relationships (Fisher & Gitelson, 1983; Fried et al., 1998). For instance, several studies have examined the potential impact of contextual and personal variables as moderators of the role stressor-job performance relationship (Fisher & Gitelson, 1983). Another possibility is to use *mediators* in the aforementioned relationship that directly indicate the remained individual capacity. Burnout may be such a mediator since it represents an outcome of the combined effect of several work characteristics (Demerouti, Bakker, Nachreiner, & Schaufeli, 2000, 2001) and indicates the depletion of individual coping and energy resources (Hobfoll & Freedy, 1993; Shirom, 1989).

Singh, Goolsby, and Rhoads (1994) provide some explanations why burnout should affect behavioral outcomes such as job performance. According to them, exhaustion diminishes the available energy of employees

and leads to an impairment of the efforts put into work. Moreover, burnout entraps employees in a negative, vicious spiral in which they do not seek help or are not prone to strive for changes in their situation, and, as a result, they continue to perform ineffectively. Finally, the experience of burnout reduces employees' self-confidence in solving work-related problems (e.g., Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003), and therefore their performance diminishes. While these explanations are plausible, results are somewhat less than convincing.

More specifically, Schaufeli and Enzmann (1998) traced five studies in which the relationship between burnout components, as measured by the Maslach Burnout Inventory–Human Services Survey (MBI-HSS), and self-reported performance were examined. They reanalyzed the data and found that, on average, self-reported performance shared 5% of its variance with emotional exhaustion, 4% with depersonalization, and 6% with reduced personal accomplishment (p. 92). The studies that examined the relationship between exhaustion and *others-rated* or objectively assessed performance resulted in even lower explained variance (only a meager 1%). In addition, several studies on burnout and objective performance that included not only exhaustion, but also depersonalization and (reduced) personal accomplishment (Parker & Kulik, 1995; Wright & Bonett, 1997) failed to find relationships between the latter two MBI dimensions and performance. Even more surprising is the finding that while some studies showed the expected negative relationships between burnout dimensions and performance (e.g., Bhagat et al., 1995; Parker & Kulik, 1995; Wright & Cropanzano, 1998), others have shown zero or positive relationships (e.g., Keijsers et al., 1995; Lazaro et al., 1985; Randall & Scott, 1988).

Should we conclude that burnout is *not* systematically related to objective performance? We believe this conclusion is premature, since there are at least two reasons why it is difficult to reveal a relationship between burnout and objective performance. First, the fact that researchers can explain only a limited amount of variance in objective performance may partly be attributed to the use

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of different sources of information, which leads to an underestimation of the strength of relationships (cf. Zapf, Dormann, & Frese, 1996). It may be expected that two sources of information (e.g., a supervisor who assesses performance and an employee who indicates his/her burnout) have their own unique causes of (statistically independent) error variance. If one uses only one method, the sources of error variance are the same. The consequence of this is inflated correlations. Second, and particularly relevant to the present study, most researchers have not made a distinction between in-role and extra-role performance. For example, Wright and Bonett (1997) used a one-item measure of global performance as assessed by the supervisors of 44 human service workers, and Wright and Cropanzano (1998) used the same measure of global performance in their study among 52 social workers. Supervisors' global performance ratings may be based on both in-role and extra-role behaviors shown by their subordinates and unrelated to any of the burnout dimensions if in-role and extra-role performance have different predictors.

Regarding extra-role performance, we could only locate the study of Klein and Verbeke (1999), who reported that depersonalization and reduced personal accomplishment but *not* emotional exhaustion had substantial negative correlations with extra-role performance. It can be hypothesized that it might be difficult for employees who experience burnout to reduce their output or quality of performance because of organizational sanctions and reward systems. Instead, they might choose to withhold behaviors that are discretionary, such as organizational citizenship behavior, since this would not result in direct consequences for themselves (Schnake, 1991). Indeed, as Schaufeli and Enzmann (1998, p. 26) note, burned-out professionals lose their concern for the organization and become hypercritical, distrusting management, peers, and colleagues, which corresponds, in other words, to low extra-role performance.

The Job Demands-Resources Model

In the present study, we use the job demands-resources (JD-R) model of burnout (Bakker,

Demerouti, De Boer, & Schaufeli, 2003; Demerouti et al., 2000, 2001) to examine how job characteristics and burnout contribute to explaining variance in in-role and extra-role performance. One central assumption of the JD-R model is that although every occupation may have its own specific work characteristics associated with burnout, it is still possible to model these characteristics in two broad categories—namely, job demands and job resources. *Job demands* refer to those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort and are therefore associated with certain physiological and/or psychological costs. Examples are a high work pressure, role overload, emotional demands, and poor environmental conditions.

Job resources refer to those physical, psychological, social, or organizational aspects of the job that are (1) functional in achieving work goals; (2) reduce job demands and the associated physiological and psychological costs; or (3) stimulate personal growth and development. Resources may be located at the level of the organization (e.g., salary, career opportunities, job security), interpersonal and social relations (e.g., supervisor and coworker support, team climate), the organization of work (e.g., role clarity, participation in decision making), and the level of the task (e.g., performance feedback, skill variety, task significance, task identity, autonomy). In fact, these latter working characteristics are the classical job characteristics in Hackman and Oldham's (1976) model. In general, job demands and resources are negatively related, since job demands such as a high work pressure and emotionally demanding interactions with clients may preclude the mobilization of job resources (see Bakker, Demerouti, De Boer et al., 2003, Bakker, Demerouti, & Euwema, 2003b; Demerouti et al., 2000, 2001). In a similar vein, high job resources such as social support and feedback may reduce job demands.

A second assumption in the JD-R model is that working characteristics may evoke two psychologically different processes (see Figure 1; the numbers in the figure correspond with the hypotheses). In the first

Workload

Emotional
Demands

Work-Home
Conflict

Autonomy

Possibilities
Development

Social
Support

Job Demands — + → **Exhaustion** — - → **In-Role Performance** 1

Job Resources — - → **Disengagement** — - → **Extra-Role Performance** 2
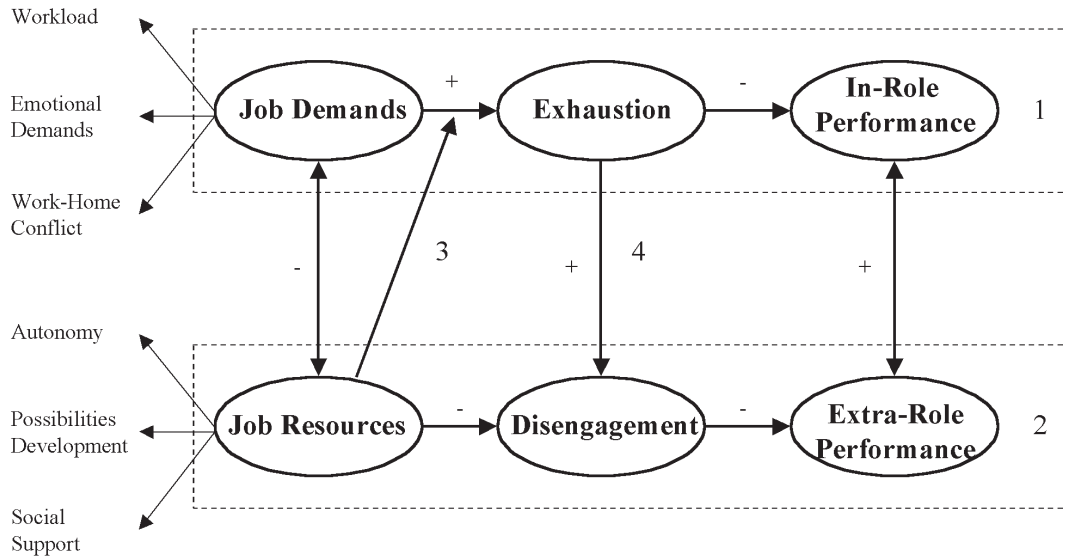
- 3 + 4 +

Figure 1. The Job Demands-Resources Model Applied to Burnout and Performance.

process, demanding aspects of work (i.e., work overload) lead to constant overtaxing and, in the long run, exhaustion (e.g., Lee & Ashforth, 1996; Leiter, 1993; Wright & Cropanzano, 1998). The literature on mental fatigue may be used to explain this process. Mental fatigue is a response of the mind and body to the reduction in resources due to mental task execution. It warns of the increasing risk of performance failure (Veldhuizen, Gaillard, & de Vries, 2003). Under normal circumstances, people become tired by their everyday work activities, but their energetical resources are sufficient to meet the task demands. However, when a person is working under high levels of (mental) workload and is already fatigued (e.g., at the end of a workday), extra energy to compensate fatigue has to be mobilized through mental effort in order to maintain task performance (Gaillard, 2001; Hockey, 1997; Hockey, Coles, & Gaillard, 1986). The mobilization of extra energy may result in (feelings of) acute fatigue. A subsequent return to physiological and emotional baseline levels is crucial. Incomplete recovery from workload demands disrupts the energetic homeostasis, which in turn may lead to chronic effects on

health and well-being (Frankenhaeuser, 1979; Frankenhaeuser & Johansson, 1986). When incomplete recovery takes place, the effects of high workload demands can accumulate gradually, carrying over from one day to the next (Craig & Cooper, 1992; Frankenhaeuser, 1980; Frankenhaeuser & Johansson, 1986; Gaillard, 2001; Ursin, 1980). Veldhuizen et al. (2003), using office tasks in order to simulate a working day, found that exhausted participants (assessed with the emotional exhaustion subscale of the Maslach Burnout Inventory; Maslach & Jackson, 1986) had problems investing sufficient energy in their tasks. Moreover, their performance results decreased since they reacted more slowly and produced a smaller number of correct responses. Exhausted subjects seemed to be unable to perform particularly well in the evening, although they tried to invest more effort than their nonexhausted counterparts.

This implies that when people become exhausted under the influence of environmental demands, they will not be able to perform well because their energetical resources are diminished. Thus, the impact of job demands on job performance should be mediated by the feelings of (enhanced)

exhaustion (cf. Hockey, 1993). Therefore, we formulated the following hypothesis:

Hypothesis 1: Job demands (and not job resources) will be the most important antecedents of in-role performance, through the experience of exhaustion. Thus, we expect that exhaustion will play a mediating role in the relationship between job demands and in-role performance.

In the second process proposed by the JD-R model, a lack of job resources precludes actual goal accomplishment, which causes failure and frustration (Bakker, Demerouti, De Boer et al., 2003). Usually, when employees do possess resources (such as support from colleagues or having the ability to organize one's own work) they tend to go beyond actual goal accomplishment (*job crafting*; Wrzesniewski & Dutton, 2001). For instance, Wayne, Shore, and Liden (1997) showed that perceived organizational support predicted citizenship behavior, which included helping one another and helping new colleagues to orient and so take over for the manager. In addition, as Goodman and Svyantek (1999) claim, contextual or extra-role performance derives from the psychological contract between employees and organization. The psychological contract prescribes the manner in which organizations reward employees for extra effort above their task performance (Makin, Cooper, & Cox, 1996). It establishes reciprocity rules showing how employees' extra effort is rewarded by the organization (Goodman & Svyantek, 1999). However, when organizations do not provide or reward employees with job resources, the long-term consequence is withdrawal from work, and reduced motivation and commitment (Bakker, Demerouti, De Boer et al., 2003a; Demerouti et al., 2001), and this takes away one of the primary mechanisms by which extra-role performance is supported by the organization (Goodman & Svyantek, 1999). We believe that in such a situation a reduction of motivation or withdrawal from work can be an important self-protection mechanism that may prevent the future frustration of not obtaining work-related goals (cf. Antonovsky, 1987; Hackman & Oldham,

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1976) or of not being rewarded for extra effort above task performance (cf. Goodman & Svyantek, 1999).

When the external environment lacks resources, individuals cannot reduce the potentially negative influence of high job demands and they cannot achieve their work goals. Additionally, they cannot develop themselves further in their job and organization. Conservation of resources (COR) theory predicts that in such a situation, employees will experience a loss of resources or failure to gain an investment (Hobfoll, 1989; Hobfoll & Freedy, 1993). Moreover, in order to reduce this discomfort or job stress, employees will attempt to minimize losses. With the intention of achieving equity without having further negative, personal consequences (like, for instance, when they lower their in-role performance) they will most probably reduce their discretionary inputs (Schnake, 1991). In other words, we expect that in order to attain their main resources (or equity between inputs and outputs), employees will engage in loss-based selection (Freund, Li, & Baltes, 1999), specifically seeking to reduce extra-role performance and focusing more on in-role performance. In short, it can be hypothesized that when employees lack job resources, extra-role performance will suffer accordingly (see also Figure 1).

Hypothesis 2: Job resources (and not job demands) will be the most important predictors of extra-role performance, through their influence on disengagement. Thus, we expect that disengagement will play a mediating role in the relationship between job resources and extra-role performance.

Interactions between Job Demands and Resources

One of the assumptions in the JD-R model that has received little research attention so far is that job resources may *buffer* the impact of job demands on stress reactions, including burnout. This assumption is consistent with the demand-control model (DCM; Karasek, 1979) and the effort-reward imbalance (ERI) model (Siegrist, 1996), but expands these models by claiming that *several*

different job resources can play the role of buffer for *several* different job demands. Which job demands and resources play a role in a certain organization depends upon the specific job characteristics that prevail. Thus, whereas the DCM states that control over the execution of tasks (autonomy) may buffer the impact of work pressure on job stress, the JD-R model expands this view and states that many different types of job demands and job resources may interact in predicting job stress.

In their study among four home-care organizations, Bakker, Demerouti, Taris et al. (2003) found evidence for the buffering role of job resources. More specifically, they found that the impact of job demands (e.g., workload, physical demands, and patient harassment) on feelings of exhaustion was particularly strong if home-care professionals possessed few resources (e.g., autonomy, possibilities for professional development, performance feedback). In a similar vein, in their study among over 1,000 employees of a large institute for higher education, Bakker, Demerouti, & Euwema (2003) showed that several job demands only influenced burnout if employees possessed few job resources (autonomy, social support, supervisory coaching, and feedback).

The buffer hypothesis is consistent with Kahn and Byosiere (1992), who argue that the buffering or interaction effect can occur between any pair of variables in the stress-strain sequence. They claim that properties of the work situation, as well as characteristics of the individual, can buffer the effects of a stressor. The buffering variable can reduce the tendency of organizational properties to generate specific stressors, alter the perceptions and cognitions evoked by such stressors, moderate responses that follow the appraisal process, or reduce the health-damaging consequences of such responses (Kahn & Byosiere, 1992, p. 622). Social support is probably the most well-known situational variable that has been proposed as a potential buffer against job stress (e.g., Haines, Hurlbert, & Zimmer, 1991; Johnson & Hall, 1988; see Van der Doef & Maes, 1999, for a review). Other characteristics of the work situation that may act as moderators are (a) the

extent to which the onset of a stressor is predictable (e.g., role ambiguity and feedback), (b) the extent to which the reasons for the presence of a stressor are understandable (e.g., through information provided by supervisors), and (c) the extent to which aspects of the stressor are controllable by the person who must experience it (e.g., job autonomy; Kahn & Byosiere, 1992). This leads to our third hypothesis (see also Figure 1).

Hypothesis 3: Job resources buffer the relationship between job demands and exhaustion. More specifically, the relationship between job demands and exhaustion will be stronger for employees with few (versus many) resources.

Finally, we explore whether Leiter's (1993) process model of burnout may be added to the JD-R model. Leiter's model states that feelings of exhaustion evoke cynical attitudes toward work as employees attempt to gain emotional distance from their job as a way of coping with stress (cf. escape/emotion-focused coping; Latack & Havlovic, 1992). This model has been supported by several studies (e.g., Bakker, Schaufeli, Sixma, Bosveld, & Van Dierendonck, 2000; Cordes, Dougherty, & Blum, 1997). Thus, we assume that exhaustion fostered by job demands may evoke psychological withdrawal (cf. Bakker, Demerouti, Taris, et al., 2003). Or, in terms of our fourth and final hypothesis:

Hypothesis 4: Exhaustion has a positive relationship with disengagement.

Note that this latter hypothesis implies that the two basic processes proposed by the JD-R model are not totally independent. More specifically, inclusion of Leiter's process model in the JD-R model means that job demands are not only related to (reduced) in-role performance (through exhaustion), but also to (reduced) extra-role performance. The combination of hypotheses 1, 2, and 4 implies the following sequence: job demands → exhaustion → disengagement → extra-role performance (see also Figure 1). Thus, the compensatory strategy used to deal with high

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demands will eventually lead to exhaustion, and exhaustion will lead to withdrawal from work (disengagement). This disengagement, in turn, will lead to decreased extra-role performance. Nevertheless, we expect that job demands will be the most important antecedents of in-role performance, through the experience of exhaustion, whereas job resources will be the most important predictors of extra-role performance, through their influence on disengagement.

Method

Participants and Procedure

The participants in the present study were employed in several different sectors and job positions. Warr (1990) has advised to include such a broad range of job positions for the test of relationships between job characteristics and outcomes because this would increase the probability to find variation in job characteristics. After a first phone call, supervisors from several small and large companies received a letter explaining the goal of the study. Three days later, they were contacted by telephone again to ask how many questionnaires could be sent. In total, 274 questionnaires were distributed to a total of 11 companies. In the accompanying letter, the anonymity and confidentiality of the data were emphasized. In addition, participants were instructed to ask one colleague to fill out one separate page including questions regarding in-role and extra-role performance. The dyads were later matched by using a unique code for each set of questionnaires. Participants and their colleagues could send back the questionnaires separately with stamped envelopes. Two and four weeks after the distribution of the questionnaires, reminder phone calls were made.

A total of 146 employees and their colleagues filled out and returned the questionnaire (response rate was 53%). The sample includes 65 males (45%) and 81 females (55%). Their ages ranged from 21 to 62 years with an average of 38 years ($sd = 10.66$). The majority of the sample had a university degree (36%) or higher vocational training (32%). Organizational tenure was 14 years ($sd = 11.20$), and 86% of the sample were

salaried. Since we did not ask participants at which company or institute they worked, we do not know how many different organizations were included in the study. However, what we do know is that most participants worked with people (72%); 23% worked primarily with information and 5% worked primarily with things. They were employed in the following sectors: industrial work (6.9%), construction (.7%), trade (5.6%), pubs and restaurants (1.4%), transportation (8.3%), financial institutions (1.4%), business services (28.5%), communications (6.9%), government (13.2%), education (1.4%), health care (12.5%), culture and recreation services (8.3%), or other (4.9%).

Measures

Job Demands. Three job demands potentially related to burnout were included in the questionnaire—workload, emotional demands, and work-home conflict. *Workload* was based on a Dutch version (Furda, 1995) of Karasek's (1985) job content instrument. The scale includes five items that refer to quantitative, demanding aspects of the job. Examples are "Do you have too much work to do?" "Do you have to work very fast?" and "How often does it occur that you have to work extra hard to finish your work?" Responses could be made on a five-point scale (1 = never, 5 = always). *Emotional demands* were based on a scale developed by Van Veldhoven and Meijman (1994) and included four items. Examples are "Does your work put you in emotional situations?" and "Do the people who you meet through your work intimidate you?" (1 = never, 5 = always). Finally, work-home *conflict* was assessed with three items, based on Geurts (2000). For example: "How often does it happen that your work schedule makes it difficult for you to fulfill your domestic obligations?" and "How often do you find it difficult to fulfill your domestic obligations because you are constantly thinking about work?" (1 = never, 5 = always).

Job Resources. Three job resources were included in the questionnaire—autonomy, pos-

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sibilities for professional development, and social support from colleagues. *Autonomy* was assessed with a three-item scale, based on Karasek's (1985) job content instrument. Example items are "I can decide myself how I execute my work" and "On my job, I have freedom to decide how I do my work" (1 = never, 5 = always). *Possibilities for professional development* were measured with the three-item scale of Bakker, Demerouti, Taris et al. (2003), including "My work offers me the opportunity to learn new things" and "I have sufficient possibilities to develop myself at work" (1 = totally disagree, 5 = totally agree). *Social support* was measured with three items of the scale developed by Van Veldhoven and Meijman (1994). Example items are "Can you ask your colleagues for help if necessary?" and "Can you count on your colleagues when you face difficulties at work?" (1 = never, 5 = always). All responses were coded such that higher scores referred to higher job demands and more job resources, respectively.

Burnout. The Oldenburg Burnout Inventory (OLBI; Demerouti et al., 2001, 2003) measures the two core dimensions of burnout: exhaustion and disengagement. The eight items of the *exhaustion* subscale are generic and refer to general feelings of emptiness, overtaxing from work, a strong need for rest, and a state of physical exhaustion. Example items are "After my work, I usually feel worn out and weary" and "After working, I have enough energy for my leisure activities" (reversed) (1 = totally disagree, 4 = totally agree). Four items were positively worded and four negatively. *Disengagement* refers to distancing oneself from the object and the content of one's work and to negative, cynical attitudes and behaviors toward one's work in general. This subscale also comprises eight items, including "It happens more and more often that I talk about my work in a negative way" and "I feel more and more engaged in my work" (reversed). Similar answering categories to the ones employed for exhaustion were used. Again, four items were positively worded and four negatively.[1] The positive and negative exhaustion and disengagement items were presented in mixed form. A recent study among 232 Greek employees from different occupational groups (e.g., banking and insurance, chemical industry) examined the factorial and convergent validity of the OLBI and the Maslach Burnout Inventory–General Survey (MBI-GS; Demerouti et al., 2003). Results of confirmatory factor analyses supported the proposed factor structure for both instruments. In addition, the convergent and discriminant validity of the OLBI vis-à-vis the MBI-GS was supported by the results of multitrait-multimethod analyses.

In-role performance was assessed with nine items, based on Goodman and Svyantek (1999). Example items are "Demonstrates expertise in all job-related tasks" and "Achieves the objectives of the job." Colleagues of the participants were asked to indicate the extent to which they found each statement characteristic of the participant (0 = not at all characteristic, 6 = totally characteristic).

Extra-role performance is defined as actions that go beyond what is stated in formal job descriptions and that increase organizational effectiveness (McKenzie, Podsakoff, & Fetter, 1991). The instrument utilized in the present research was Goodman and Svyantek's (1999) measure and included seven items. They based their instrument on Smith, Organ, and Near's (1983) organizational citizenship behavior measure, and labeled their measure "altruism," characterized as citizenship behavior toward individuals. Example items used by the observers (colleagues) are "Willingly attends functions not required by the organization, but helps in its overall image," and "Takes initiative to orient new employees to the department even though not part of his/her job description." The same answer categories as for in-role performance were used.

Strategy of Analysis

In order to test the JD-R model, we performed structural equation modeling (SEM) analyses using the AMOS software package (Arbuckle, 1997). The fit of the model to the data was examined with the adjusted-goodness-of-fit index (AGFI) and the root mean square error of approximation (RMSEA). Further, the nonnormed fit index (NNFI), the comparative fit

Extra-role performance *is defined as actions that go beyond what is stated in formal job descriptions and that increase organizational effectiveness.*

index (CFI), and the incremental fit index (IFI) are utilized. In general, models with fit indices > .90 and an RMSEA < .08 indicate a close fit between the model and the data (Browne & Cudeck, 1989; Hoyle, 1995). The six job characteristics were modelled in two latent factors, one representing job demands (three indicators) and the other job resources (three indicators), which were treated as exogenous variables in the model. The two burnout dimensions—exhaustion and disengagement—were included as endogenous, mediating variables. The two multi-item scales were treated as single indicators of each construct. We corrected for measurement error by setting the random error variance associated with each construct equal to the product of its variance and the quantity one minus the estimated reliability (Bollen, 1989). This approach has been used in several previous studies (e.g., Frone, Russell, & Cooper, 1992; Schaubroeck, Cotton, & Jennings, 1989), and the utility of this approach has been supported by a study by Netemeyer, Johnston, and Burton (1990). Finally, in-role and extra-role performance were each indicated by the multi-item scales introduced before and included as endogenous outcome variables. Correction for measurement error was realized similar to the procedure followed for the two burnout scales. Finally, the latent factors of job demands and resources were allowed to correlate, and the hypothesized relationships were included in the model.

Results

Descriptive Statistics

Table I shows the means, intercorrelations, and the internal consistencies (Cronbach's alpha) of the scales included in the analyses. As can be seen from this table, most scales show reasonable to good reliabilities. Note, however, that the reliability coefficients for work pressure and autonomy are somewhat low (Cronbach's alpha is .69 and .68, respectively). Preliminary analyses revealed that demographic variables were not substantially related to the model components, and that inclusion of these variables in the structural equation model did not significantly affect the results. They were therefore omitted from further analyses.

Several relationships from Table I are worth noting. First, the raw scores of the three job demands are only marginally (not significantly) related to the other ratings of in-role performance, while among the job resources "possibilities for professional development" is

TABLE I Means, Standard Deviations, Internal Consistencies (Standardized Alphas—on the Diagonal) and Correlations between the Variables (N = 146)

	Range	M	sd	1	2	3	4	5	6	7	8	9	10
1. Work pressure	(1–5)	2.96	.80	(.69)									
2. Emotional demands	(1–5)	1.98	.67	.32**	(.80)								
3. Work-home interference	(1–5)	1.82	.65	.47**	.33**	(.72)							
4. Autonomy	(1–5)	3.78	.73	.17*	.20*	.24**	(.68)						
5. Possibilities development	(1–5)	3.81	.77	.27**	.18*	.19*	.48**	(.86)					
6. Social support	(1–5)	4.14	.63	−.10	−.14	−.29**	.21*	.31**	(.81)				
7. Exhaustion	(1–4)	2.09	.44	.29**	.24**	.38**	−.05	−.13	−.32**	(.75)			
8. Disengagement	(1–4)	2.16	.50	−.12	−.16	−.04	−.43**	−.70**	−.35**	.35**	(.81)		
9. In-role performance (other)	(0–6)	4.22	.94	.15	.00	.08	.03	.11	.10	−.23*	−.16*	(.90)	
10. Extra-role performance (other)	(0–6)	4.17	.95	.20*	.08	.14	.10	.22**	.08	−.18*	−.24**	.73**	(.88)

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

particularly related to other-ratings of extra-role performance. Second, both exhaustion and disengagement are significantly and negatively related to in-role and extra-role performance. Third, several job demands and resources show unexpected *positive* relationships with each other. These relationships will be addressed in the discussion section.

Dimensionality of Job Demands and Resources

The next step in the analyses was to test the dimensionality of the job demands-resources measurement model. The observed variables were, in this case, all items measuring the working conditions. These were used as the indicators of the first-order latent factors (i.e., the specific working conditions). The specific working conditions were the indicators of two second-order latent factors: job demands and job resources. This measurement model showed a reasonable fit to the data: χ^2 (202) = 306.07, AGFI = .81, RMSEA = .06, NNFI = .90, CFI = .92, IFI = .92. All items had significant loadings on the intended working conditions, and all working conditions had significant loadings on the intended second-order latent factors.

Probably more important, the proposed measurement model was significantly better than a model including only one second-order latent factor (i.e., the general working environment), $\Delta\chi^2$ (1) = 21.75, $p < .001$.

Test of the Job Demands-Resources Model

SEM analyses were used to test the JD-R model and hypotheses 1, 2, and 4 (see Figure 1). The results showed that the proposed model did not fit adequately to the data (see first row in Table II). Inspection of the modification indices showed that this was particularly due to the path between job resources and exhaustion. Therefore, this path was included in a second model (M2). This revised model fit closely to the data and was significantly better than the initial model, $\Delta\chi^2$ (1) = 18.58, $p < .001$. With the exception of the AGFI, which is sensitive to sample size, all fit indices have values higher than .90, and the RMSEA is .08 (see second row in Table II).

Importantly, all indicators loaded significantly on the intended latent factors, and the proposed relationships in the JD-R were significant, and in the expected direction. The coefficient of the path from job demands to

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TABLE II **Results of Structural Equation Modeling: Fit Indices of the Job Demands-Resources Model and the Alternative Models, Standardized Maximum Likelihood Estimates (N = 146)**

Model	χ^2	df	AGFI	RMSEA	NNFI	CFI	IFI
M1. JD-R model	75.79	32	.85	.09	.85	.90	.90
M2. JD-R model, revised	57.21	31	.88	.08	.91	.94	.94
M3. Alternative model	56.96	30	.88	.08	.90	.94	.94
M4. Alternative model	55.34	29	.88	.08	.90	.94	.94
M5. Direct effects model	53.42	29	.88	.08	.91	.94	.94
M6. Direct effects model	55.25	29	.88	.08	.90	.94	.94
M7. Final, revised JD-R model	53.93	30	.88	.07	.91	.94	.95
M0. Null model	664.73	45	.50	.25			

Note. χ^2 = chi-square; df = degrees of freedom; GFI = goodness-of-fit index; RMSEA = root mean square error of approximation; NNFI = non-normed fit index; CFI = comparative fit index; IFI = incremental fit index; M2 = Revised JD-R model, including the path from job resources to exhaustion; M3 = Alternative model, including the path from job demands to disengagement; M4 = Alternative model, including the paths from exhaustion to extra-role performance, and from disengagement to in-role performance; M5 = direct effects model, including the paths from job demands to in-role performance, and from job resources to extra-role performance; M6 = direct effects model, including the paths from job demands to extra-role performance, and from job resources to in-role performance; M7 = Final, revised JD-R model, including the path from job resources to exhaustion, and the path from job demands to in-role performance.

exhaustion was positive and highly significant ($\gamma = .77$; $t = 4.76$, $p < .001$), whereas the coefficient of the path from job resources to disengagement was negative and highly significant ($\gamma = -.82$; $t = -8.75$, $p < .001$). In addition, the coefficient of the additional path from job resources to exhaustion was negative ($\gamma = -.52$; $t = -4,10$, $p < .001$). However, consistent with the JD-R model, job resources were more strongly related to disengagement than to exhaustion (critical ratio for differences between parameters = 3.42, $p < .01$), and job demands were more strongly related to exhaustion than job resources (critical ratio for differences = -5.23, $p < .001$).

Furthermore, the coefficient of the path from exhaustion to in-role performance was $\beta = -.18$ ($t = -2.32$, $p < .05$), whereas the coefficient of the path from disengagement to extra-role performance was $\beta = -.21$ ($t = -3.05$, $p < .01$). Finally, the covariation between job demands and job resources was $\beta = .38$ ($t = 3.06$, $p < .01$). The revised JD-R model explained 56% of the variance in exhaustion, 86% of the variance in disengagement, 3% of the variance in in-role performance, and 4% of the variance in extra-role performance.

In order to test the alternative possibility that the latent factor job demands is related to disengagement, this path was included in the model (M3). As can be seen from Table II, this modification hardly affected the fit indices, $\Delta \mathcal{X}^2$ (1) = .25, *n.s.* In addition, output inspection revealed that the relationship between job demands and disengagement was *not* significant ($\gamma = -.09$; $t = -.51$, *n.s.*). A second alternative model to be tested included the paths from exhaustion to extra-role performance, and from disengagement to in-role performance (M4). This model was also not better than the revised JD-R model (M2), $\Delta \mathcal{X}^2$ (2) = 1.87, *n.s.*, and the two additional paths were not significant (exhaustion à extra-role performance, $\beta = -.02$, $t < 1$, *n.s.*; disengagement → in-role performance, $\beta = -.13$, ($t = -1.21$, *n.s.*).

In a next step, two direct effects models were tested. The first model (M5) included direct relationships between demands and in-role performance, and between job re-

sources and extra-role performance. Table II shows that this alternative model significantly improved on M2, $\Delta \mathcal{X}^2$ (2) = 3.79, $p < .05$. However, output inspection revealed that only the direct relationship between job demands and in-role performance was significant, $\gamma = .24$, $t = 1.86$, $p < .05$ (job resources → extra-role performance, $\gamma = .17$, $t < 1$, *n.s.*). The second direct effects model (M6) included the direct paths from job demands to extra-role performance, and from job resources to in-role performance. Consistent with the JD-R model, these additions did not improve the fit between the model and the data, $\Delta \mathcal{X}^2$ (2) = 1.96, *n.s.*, and the additional paths were not significant (job demands → extra-role performance: $\gamma = .06$, $t < 1$, *n.s.*; job resources → in-role performance, $\gamma = .13$, $t = 1.39$, *n.s.*).

Taken together, these findings suggest that the proposed model should be modified by including the path from job resources to exhaustion, and the direct path from job demands to in-role performance. Table II shows that this model (M7) fits closely to the data, with all fit-indices above .90 (except the AGFI, which is .88), and an RMSEA of .06. All parameters in this final model are significant, $p's < .05$. The final model is displayed in Figure 2. In sum, job demands are the most important antecedents of in-role performance, primarily through the experience of exhaustion (cf. hypothesis 1). Job resources, on the other hand, are the most important predictors of extra-role performance, through their influence on disengagement (cf. hypothesis 2). This final model explained 8% of the variance in in-role performance and 8% of the variance in extra-role performance. Note that job resources are also negatively related to exhaustion. In addition, our findings are consistent with hypothesis 4: Exhaustion has a positive relationship with disengagement.

Interactions between Job Demands and Resources

According to hypothesis 3, job resources buffer the relationship between job demands and exhaustion. In order to test this hypoth-
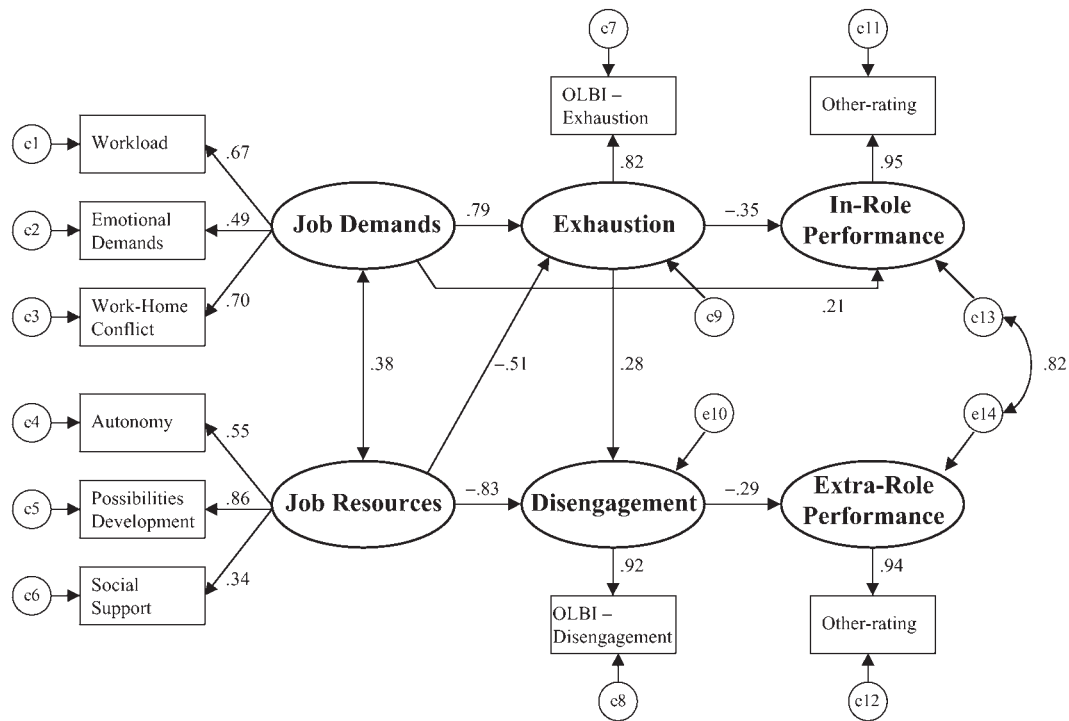
Job resources ... are the most important predictors of extra-role performance, through their influence on disengagement.

Figure 2. Maximum Likelihood Estimates of the Revised JD-R Model of Burnout and Performance (*N* = 146).

esis, a new model was built, retaining all variables and relationships included in the final, revised JD-R model (see Figure 2), except job resources. This model treats "job demands" as the only exogenous latent variable in the model. The model was tested with multigroup SEM analyses for employees with few versus many job resources (cf. Aguinis, 2001; Schumacker & Lomax, 1996). These subgroups were formed following a median-split procedure, where employees who scored lower than the median on the factor including each of the three specific resources were considered as the "few job resources" group. The others were considered as the group with many job resources.

The hypothesis would be confirmed if the model where the coefficient of the path from job demands to exhaustion is constrained to be equal in both groups would show a worse fit to the data than the unconstrained model, and if the job demands–exhaustion parameter would be higher for the "few job resources" group. The results of multigroup analyses showed that the unconstrained model did *not* fit better to the data than the constrained model, $\Delta \chi^2 \ (1) < 1$, *n.s.* This means that hypothesis 3 was rejected; job resources did not buffer the impact of job demands on exhaustion. However, through the analyses to test prior hypotheses 1, 2, and 4, job resources were found to have a main effect on exhaustion.

Discussion

Although most scholars and managers would agree that employee performance is of utmost importance for organizations' effectiveness, thus far, research on the relationship between job burnout and performance has been scarce and produced mixed findings. We argued that the main reason for these mixed findings is a lack of a sound theoretical basis. This study therefore sought to investigate the relationship between burnout and performance using

the job demands-resources model (Bakker, Demerouti, De Boer et al., 2003; Demerouti et al., 2000, 2001). Two main hypotheses were formulated, namely that job demands would be the most important predictors of in-role performance, through their relationship with the exhaustion component of burnout (i.e., chronic feelings of physical, cognitive, and emotional fatigue), whereas job resources would be the most important predictors of extra-role performance, through their relationship with the disengagement dimension of burnout (distancing oneself from one's work, work objects, or work content). The results were greatly supportive of both hypotheses, with some qualifications.

The starting point for our analysis was the OLBI, which includes feelings of exhaustion and disengagement from work as the core dimensions of burnout. Exhaustion as defined by the OLBI not only implies affective exhaustion but also physical and cognitive exhaustion, whereas disengagement includes an extensive and intensive reaction in terms of an emotional, cognitive, and behavioral rejection of the job. Next, we introduced two central dimensions of performance: in-role performance, which gauges the activities strictly required on the job, and extra-role performance, which refers to those activities that enhance the collective character of the organization. In order to avoid common-method variance problems, we asked participants' colleagues to evaluate participants' in-role and extra-role performance.

Differential Effects of Job Demands and Resources

The central idea in this article is that the demands and resources that exist within employees' working environments both have differential effects on in-role and extra-role performance. The JD-R model was indeed capable of explaining variance in other-ratings of performance in the predicted way. These findings are consistent with Bakker, Demerouti, De Boer et al.'s (2003) study, which showed that job demands were the most important predictors of exhaustion, and indirectly of absence duration during the one-year follow-up (an indicator of health problems), whereas job resources were the most important predictor of reduced commitment (a form of disengagement), and indirectly of Time 2 absence frequency (an indicator of reduced motivation).

First, when demands are high—specifically when workload, emotional demands, and work-home conflicts are elevated—it becomes difficult for employees to allocate their attention and energy efficiently because they have to engage in greater activation and/or effort and this, in turn, negatively affects their performance. Moreover, our findings are consistent with and expand findings of previous studies on performance. For instance, Wright and Bonett (1997) found that, among the burnout dimensions, only exhaustion was negatively related to in-role performance. Their longitudinal study revealed nonsignificant relationships between depersonalization (a human-service-related form of disengagement) and performance (as rated by supervisors). Also, Cropanzano, Rupp, and Byrne (2003) found that emotional exhaustion was significantly negatively related to in-role performance as rated by supervisors, while the effect of emotional exhaustion on organizational citizenship behavior was fully mediated by organizational commitment (a measure that corresponds in a way to our disengagement dimension). Additionally, the finding that the two burnout dimensions were strongly related to (in-role or extra-role) performance while perceptions of work characteristics were unrelated to it has also been reported in the literature. Accordingly, role problems (conflict, ambiguity, overload; Schaubroeck & Fink, 1998; Singh et al., 1994), workload (Schaubroeck & Fink, 1998), skill utilization (Schaubroeck & Fink, 1998), job control, and social support (Sargent & Terry, 2000; Schaubroeck & Fink, 1998) were not related to overall measures of performance.

Extra-role performance, on the other hand, is a reflection of people's availability of resources within the organization—specifically when autonomy, social support, and possibilities for professional development are high. In exchange for the availability of resources, employees are willing to go beyond their personal roles and engage in activities

that benefit the organization as a whole. These findings on extra-role performance are fairly unique, since previous studies have mainly related this aspect of performance to volitional variables associated with individual differences in motivational characteristics, predispositions, or person-environment fit (Goodman & Svyantek, 1999). While task autonomy was related to contextual performance, another term for extra-role performance (Gellalty & Irving, 2001), organizational support did not foster organizational citizenship behavior in the study of Lambert (2000). Similar to our findings, Munene (1995) found that job involvement (a motivational variable that comes close to our [dis]engagement measure) was positively related to organizational citizenship behavior.

What makes our findings noteworthy is that they link specific aspects of organizations to two specific psychological mechanisms, which, in turn, explain two different dimensions of performance. In fact, the JD-R model makes the burnout syndrome straightforward and assessable to management intervention. High demands in an employee's job generate decrements in primary task performance, because they diminish people's ability to perform well (Wright & Cropanzano, 1998). Put differently, if management is capable of reducing the demands—for instance, by means of providing employees a better focus or by requiring them to have a proper workload—(burned-out) employees' performance should increase. The JD-R model suggests that extra-role performance is also a reflection of the organizational environment but more specifically a reflection of the available resources, and, once again, resources imply such job characteristics like autonomy, social support, and possibilities for self-growth. When employees notice that they have resources available and are not presently overwhelmed by job demands, they, in exchange for those resources, tend to engage in pro-organizational actions.

This research project on the relationship between the JD-R model and extra-role performance is in line with Organ and Paine's (1999) argument that researchers ought to better articulate what it is in the organizational environment that kindles employees' investment in extra-role behaviors. As we are moving toward an era in which people work in teams and must be able to form cross-functional teams, the employee's ability to engage in extra-role performance has become key, but management now is better able to stimulate those crucial behaviors. Building upon Organ and Paine's (1999) suggestion, the organizational resources identified in this study are probably a better starting point for interventions and concrete measures than the earlier positive affective states to which extra-role behavior has been linked.

Our findings are also consistent with Moore's (2000) causal attribution approach to work exhaustion consequences. Accordingly, individuals experiencing feelings of exhaustion will be motivated to find out what the causes of their feelings are. How individuals perceive the cause of their exhaustion and attribute the blame has enormous consequences for action (cf. Pines & Aronson, 1988). An individual's attribution for the cause of their exhaustion forms the basis for decisions about how to act in order to bring about a discontinuance of such feelings. Thus, attribution theory is used to model reactions to exhaustion. Although attributions were not directly investigated in the present study, our findings are in keeping with Moore's (2000) approach. Results showed that feelings of exhaustion were positively related to disengagement. This suggests that employees psychologically withdrew from their work in cases where they felt exhausted (see also Bakker et al., 2000; Leiter & Maslach, 1988). In addition, results showed that job demands were the most important predictors of exhaustion, which, in turn, contributed to explaining in-role performance. Thus, exhausted individuals were most likely to follow the strategy of reducing their effort, thereby lowering the impact of external demands on their feelings of fatigue. In a similar vein, results showed that (lack of) job resources were the most important predictors of disengagement, which, in turn, was a unique predictor of extra-role performance. This suggests that those employees who were disengaged limited their organizational citizenship behaviors, thereby reciprocating the lack of job resources.

In general, our model could explain 8% of both in-role and extra-role performance. These percentages are clearly higher than those re-

... the JD-R model makes the burnout syndrome straightforward and assessable to management intervention.

It follows that in jobs with high job demands and limited job resources, employees develop exhaustion and disengagement, that is, burnout.

ported in previous studies using other-ratings of performance (about 1%; Schaufeli & Enzmann, 1998). Still, it seems that burnout, in contrast to the prevailing view, is not strongly linked to (low levels of) actual performance. What can we conclude from that? Either burnout or diminished well-being in general is indeed not a good predictor of work-related performance, or the instruments used for measuring job performance (including the ones used in our study) are not adequate. As Arvey and Murphy (1998) proposed, we need to evaluate a wide variety of organizational activities using a larger number of predictor vehicles in order to have a greater likelihood that performance will be more predictable.

Other Relationships in the JD-R Model

Job resources did not have a buffering effect on the relationship between job demands and exhaustion (hypothesis 3). This result is inconsistent with the findings of Bakker, Demerouti, & Euwema (2003) and Bakker, Demerouti, Taris et al. (2003), who found that several job resources were capable of diminishing the impact of job demands on exhaustion. The nonsignificant interaction effect may be attributable to the specific demands and resources included in the current study, as well the type of job positions that were investigated. Note, however, that many studies on the interactions proposed by Karasek's (1979) DCM and the extended demand-control-support model (DCS; Johnson & Hall, 1988) have similarly failed to produce significant results (cf. De Jonge & Kompier, 1997; Schreurs & Taris, 1998; Van der Doef & Maes, 1999). This means that resources such as autonomy and social support from colleagues only have limited capability of buffering the undesired impact of job demands (e.g., workload, emotional demands) on work-related strain (including exhaustion).

In contrast, job resources were *directly* and negatively related to exhaustion, although the strength of this relationship was significantly weaker than the predicted relationship between job demands and exhaustion. This finding is not in line with earlier findings (Bakker, Demerouti, De Boer et al.,

2003; Demerouti et al., 2000, 2001), but indicates that a lack of resources can produce feelings of fatigue as well. We can only speculate about the reason for this finding, but evident in the present study was that two of the three job resources (autonomy and possibilities for self-growth) were higher when job demands were higher. This suggests that those employees who could count on resources in their working environment were also the ones who were exposed to the most job demands. Nevertheless, our findings suggest that the development of each burnout component is influenced by a specific constellation of work conditions. When job demands are high, employees experience primarily elevated levels of exhaustion, whereas disengagement is affected to a lesser extent (and that through the experience of exhaustion). When job resources are lacking, employees primarily show high levels of disengagement, whereas exhaustion is affected to a lesser extent. It follows that in jobs with high job demands and limited job resources, employees develop exhaustion *and* disengagement, that is, burnout. Generally speaking, there seems to be two main processes that take place in the working environment. The first process is a stress process that initiates from job demands and results in exhaustion. The second process is motivational in nature and is driven by the availability of resources and resulting feelings of dedication. When resources are lacking, individuals experience cynicism toward their jobs.

Finally, the present study also substantiated the proposed relationship between the two burnout components, namely, exhaustion and disengagement (hypothesis 4). Consistent with Leiter's (1993) process model of burnout, feelings of exhaustion were positively related to disengagement. The burnout literature seems to systematically find evidence for this relationship (e.g., Bakker et al., 2000; Cordes et al., 1997) and, consequently, this relationship should be added to the JD-R model. Apparently, employees attempt to gain emotional distance from their job as a way of coping with their work-related feelings of exhaustion.

Strengths and Weaknesses

Some weaknesses of this study should be mentioned as well. First, we used cross-sectional data to examine presumed causal relationships between the variables in the JD-R model, and the response rate was 53%. Therefore, the present findings are tentative until replicated in studies with a higher response rate and longitudinal designs. For example, one may argue that in-role performance is also an antecedent of job demands, since working hard and doing well in one's job may positively influence the perception of job demands. Indeed, evidence for such reversed causal effects has been found in some previous longitudinal studies (see Zapf et al., 1996, for an overview). On the positive side, however, our findings were basically in line with our hypotheses and consistent with previous research (Bakker, Demerouti, De Boer et al., 2003; Demerouti et al., 2001). Although some of our measures were highly correlated (e.g., exhaustion and disengagement, in-role and extra-role performance), we found strong evidence for two processes: a stress process and a motivational process. In addition, we used a heterogeneous sample of employees from several organizations. Thus, our findings seem generalizable over different companies and working environments. Another positive feature of our study is that we used peer ratings of performance, which may be less subject to common method variance than self-reports. A second weakness of this study is that we could only incorporate a few job demands and resources in our questionnaire. Future studies may include more job characteristics in order to test the full potential of the JD-R model in predicting burnout and performance. Finally, we restricted our analysis to only one type of extra-role performance: altruism. Future studies are needed to examine whether similar results are found when using other organizational citizenship behavior dimensions, such as conscientiousness, courtesy, and sportsmanship.

Practical Implications

The JD-R model assumes that whereas every occupation may have its own specific risk factors associated with burnout, these factors can be classified in two general categories (i.e., job demands and job resources), thus constituting an overarching model that may be applied to various occupational settings, irrespective of the particular demands and resources involved. The central assumption of the JD-R model is that burnout develops—irrespective of the type of job or occupation—when (certain) job demands are high and when (certain) job resources are limited.

This implies that the JD-R model can be used as a tool for human resource management. In close collaboration with human resource managers and consultants, the model has now been applied in over 130 different organizations in the Netherlands. Because every occupation may have its own unique risk factors of burnout, we have started to use a two-stage procedure in our organizational research with the JD-R model. The first *qualitative* phase of the research includes exploratory interviews with job incumbents from different layers of an organization (e.g., representatives from management, staff, shop floor). The interviews, which last approximately 45 minutes, include open questions about the jobs of the interviewees and refer to positive and negative aspects. The incorporation of a qualitative phase in the research is valuable because it can generate knowledge about unexpected, organization-specific job demands and job resources that will be overlooked by highly standardized approaches. For example, it is conceivable that in one organization (e.g., a production company), employees are exposed to high physical job demands, whereas in another organization (e.g., an insurance company), employees are not exposed to such demands at all. In addition, in certain companies, employees are confronted with mergers, which may cause job insecurity and role ambiguity. Such organization-specific job demands can be traced in the exploratory qualitative phase.

In the second phase of the research, the job demands and job resources potentially associated with burnout are operationalized in items and scales and incorporated in a tailor-made questionnaire. All employees from an organization are then invited to fill out this questionnaire. This enables a quantitative

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analysis of the job demands and job resources that have been identified qualitatively and that potentially play a role in the development of burnout. The analysis usually concentrates on differences between departments and job positions in terms of job demands, resources, and burnout and its consequences. In some projects, managers participate in JD-R workshops before the start of the study so they can learn how to use the information that will become available. The subgroup analyses can provide clear indications for interventions, since they highlight the strengths and the weaknesses of departments and job positions. Tailor-made interventions are then possible, aimed at reducing the identified job demands and increasing the most important job resources, which, in turn, may decrease the risk for burnout and consequently improve performance at the task and contextual level.

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NOTE

1. The original OLBI (Demerouti et al., 2001, 2003) included fifteen items: seven exhaustion items (four negatively and three positively worded items) and eight disengagement items (five negatively and three positively worded items). The OLBI was slightly adjusted by adding one positively framed exhaustion item and rephrasing one negatively framed disengagement item. Thus, we used a balanced instrument including eight negatively framed and eight positively framed items.

REFERENCES

Aguinis, H. (2001, May). Pitfalls in estimating moderating effects: Implications for W&O psychology research and practice. Paper presented at the 10th European Congress on Work and Organizational Psychology, Prague, Czech Republic.

Antonovsky, A. (1987). Unraveling the mystery of health: How people manage stress and stay well. San Francisco, CA: Jossey-Bass.

Arbuckle, J. L. (1997). Amos users' guide. Version 3.6. Chicago: Smallwaters.

Aronson, E., Pines, A. M., & Kafry, D. (1983). Ausgebrannt. Vom Überdruß zur Selbstentfaltung. [Burnout: From tedium to personal growth]. Stuttgart, Germany: Klett-Cotta.

Arvey, R. D., & Murphy, K. R. (1998). Performance evaluation in work settings. Annual Review of Psychology, 49, 141–168.

Bakker, A. B., Demerouti, E., De Boer, E., & Schaufeli, W. B. (2003). 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. (2003). Which job resources buffer the impact of job demands on burnout? Manuscript submitted for publication.

Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2002). The validity of the Maslach Burnout Inventory—General survey: An Internet study. Anxiety, Stress, and Coping, 15, 245–260.

Bakker, A. B., Demerouti, E., Taris, T., Schaufeli, W. B., & Schreurs, P. (2003). A multi-group analysis of the job demands-resources model in four home care organizations. International Journal of Stress Management, 10, 16–38.

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.

Behrman, D. N., & Perreault, W. D. J. (1984). A role stress model of the performance and satisfaction of industrial salespersons. Journal of Marketing, 48, 9–21.

Bhagat, R. S., Allie, S. M., & Ford, D. L. (1995). Coping with stressful events: An empirical analysis. In R. Crandall & P. L. Perrewé (Eds.), Occupational stress: A handbook. Series in health psychology and behavioral medicine (pp. 93–112). Philadelphia, PA: Taylor and Francis.

Bollen, K. A. (1989). Structural equations with latent variables. New York: Wiley.

Browne, M. W., & Cudeck, R. (1989). Single sample cross-validation indices for covariance structures. Multivariate Behavioral Research, 24, 445–455.

Cordes, C. L., & Dougherty, T. W. (1993). A review and integration of research on job burnout. Academy of Management Review, 18, 621–656.

Cordes, C. L., Dougherty, T. W., & Blum, M. (1997). Patterns of burnout among managers and professionals: A comparison of models. Journal of Organizational Behavior, 18, 685–701.

Craig, A., & Cooper, R. E. (1992). Symptoms of acute and chronic fatigue. In A. P. Smith & D. A. Jones (Eds.), Handbook of human performance (pp. 289–340). San Diego: Academic Press.

Cropanzano, R., Rupp, D. E., & Byrne, Z. S. (2003). The relationship of emotional exhaustion to work attitudes, job performance, and organizational citizenship behaviors. Journal of Applied Psychology, 88, 160–169.

De Jonge, J., & Kompier, M. A. J. (1997). A critical examination of the demand-control-support model from a work psychological perspective. International Journal of Stress Management, 4, 235–258.

Demerouti, E., Bakker, A. B., Nachreiner, F. & Schaufeli, W. B. (2000). A model of burnout and life satisfaction among nurses. Journal of Advanced Nursing, 32, 454–464.

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., Bakker, A.B., Vardakou, I., & Kantas, A. (2003). The convergent validity of two burnout instruments: A multitrait-multimethod analysis. European Journal of Psychological Assessment, 19, 12–23.

Fisher, C. D., & Gitelson, R. (1983). A meta-analysis of the correlates of role conflict and ambiguity. Journal of Applied Psychology, 68, 320–333.

Frankenhaeuser, M. (1979). Psychoneuroendocrine approaches to the study of emotion as related to stress and coping. In H. E. Howe & R. A. Dienstbier (Eds.), Nebraska symposium on motivation 1978 (pp. 123–161). Lincoln: University of Nebraska Press.

Frankenhaeuser, M. (1980). Psychoneuroendocrine approaches to the study of stressful person-environment transactions. In H. Selye (Ed.), Selye's guide to stress research (Vol. I; pp. 46–70). New York: Van Nostrand Reinhold.

Frankenhaeuser, M., & Johansson, G. (1986). Stress at work: Psychobiological and psychosocial aspects. International Review of Applied Psychology, 35, 287–299.

Freudenberger, H. J. (1974). Staff burn-out. Journal of Social Issues, 30, 159–166.

Freund, A., Li, K. Z., & Baltes, H. P. B. (1999). Successful development and aging. In J.

Brandtstädter & R. M. Lerner (Eds.), Action and development: Theory and research through the life span (pp. 401–434). Thousand Oaks, CA: Sage Publications.

Fried, Y., Ben-David, H. A., Tiegs, R. B., Avital, N., & Yeverechyahu, U. (1998). The interactive effect of role conflict and role ambiguity on job performance. Journal of Occupational and Organizational Psychology, 71, 19–27.

Frone, M. R., Russell, M., & Cooper, M. L. (1992). Antecedents and outcomes of work-family conflict: Testing a model of the work-family interface. Journal of Applied Psychology, 77, 65–78.

Furda, J. (1995). Werk, persoon en welzijn: Een toets van het JD-C model [Work, personality, and well-being: A test of the JD-C model]. Unpublished doctoral dissertation, Utrecht University, Netherlands.

Gaillard, A. W. K. (2001). Stress, workload, and fatigue as three biobehavioral states: A general overview. In P. A. Hancock & P. A. Desmond (Eds.), Stress, workload, and fatigue (pp. 623–640). Mahwah, NJ: Lawrence Erlbaum.

Gellatly, I. R., & Irving, P. G. (2001). Personality, autonomy and contextual performance of managers. Human Performance, 14, 231–245.

Geurts, S. A. E. (2000). SWING: Survey work-home interference Nijmegen. Internal research report. Nijmegen, Netherlands: University of Nijmegen.

Goodman, S. A., & Svyantek, D. J. (1999). Person-organization fit and contextual performance: Do shared values matter? Journal of Vocational Behavior, 55, 254–275.

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

Haines, V. A., Hurlbert, J. S., & Zimmer, C. (1991). Occupational stress, social support, and the buffer hypothesis. Work and Occupations, 18, 212–235.

Hobfoll, S. E. (1989). Conservation of resources: A new approach at conceptualizing stress. American Psychologist, 44, 513–524.

Hobfoll, S. E., & Freedy, J. (1993). Conservation of resources: A general stress theory applied to burnout. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds.), Professional burnout: Recent developments in theory and research (pp. 115–129). Washington, DC: Taylor and Francis.

Hockey, G. R. J. (1993). Cognitive-energetical control mechanisms in the management of work demands and psychological health. In A. Baddely & L. Weiskrantz (Eds.), Attention: Selection, awareness, and control (pp. 328–345). Oxford, UK: Clarendon Press.

Hockey, G. R. J. (1997). Compensatory control in the regulation of human performance under stress and high workload: A cognitive-energetical framework. Biological Psychology, 45, 73–93.

Hockey, G. R. J., Coles, M. G. H., & Gaillard, A. W. K., (1986). Energetical issues in research on human information processing. In G. R. J. Hockey & A. W. K. Gaillard (Eds.), Energetics in human information processing (pp. 3–21). Dordrecht: Nijhoff.

Hoyle, R. H. (1995). The structural equation modeling approach: Basic concepts and fundamental issues. In R. H. Hoyle (Ed.), Structural equation modeling, concepts, issues, and applications (pp. 1–15). Thousand Oaks, CA: Sage.

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.

Kahn, R. L., & Byosiere, P. (1992). Stress in organizations. In M. D. Dunnette & L. M. Hough (Eds.), Handbook of industrial and organizational psychology (Vol. 3; pp. 571–650). Palo Alto, CA: Consulting Psychologists Press.

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

Karasek, R. (1985). Job content instrument: Questionnaire and user's guide, revision 1.1. Los Angeles: University of Southern California.

Keijsers, G. J., Schaufeli, W. B., Le Blanc, P. M., Zwerts, C., & Reis-Miranda, D. (1995). Performance and burnout in intensive care units. Work and Stress, 9, 513–527.

Klein, D. J., & Verbeke, W. (1999). Autonomic feedback in stressful environments: How do individual differences in autonomic feedback relate to burnout, job performance, and job attitudes in salespeople? Journal of Applied Psychology, 84, 911–924.

Lambert, S. J. (2000). Added benefits: The link between work-life benefits and organizational citizenship behavior. Academy of Management Journal, 43, 801–815.

Latack, J. C., & Havlovic, S. J. (1992). Coping with job stress: a conceptual evaluation framework for coping measures. Journal of Organizational Behavior, 13, 479–508.

Lazaro, L., Shinn, M., & Robinson, P. E. (1985). Burnout, performance and job withdrawal behavior. Journal of Health and Human Resources Administration, 7, 213–234.

Lee, R. T., & Ashforth, B. E. (1993). A further examination of managerial burnout: Toward an integrated model. Journal of Organizational Behavior, 14, 3–20.

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.

Leiter, M. P., & Maslach, C. (1988). The impact of interpersonal environment of burnout and organizational commitment. Journal of Organizational Behavior, 9, 297–308.

Leiter, M. P., & Schaufeli, W. B. (1996). Consistency of the burnout construct across occupations. Anxiety, Stress and Coping, 9, 229–243.

Makin, P., Cooper, C., & Cox, C. (1996). Organizations and the psychological contract. Westport, CT: Praeger.

Maslach, C., & Jackson, S. E. (1986). Maslach Burnout Inventory (2nd ed.). Palo Alto, CA: Consulting Psychologists Press.

Maslach, C., Jackson, S. E., & Leiter, M.P. (1996). Maslach Burnout Inventory. Manual (3rd ed.). Palo Alto, CA: Consulting Psychologists Press.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. Annual Review of Psychology, 52, 397–422.

McGrath, J. E. (1976). Stress and behavior in organizations. In M. D. Dunnette (Ed.), Handbook of industrial and organizational psychology (pp. 1351–1396). Chicago: Rand-McNally.

McKenzie, S. B., Podsakoff, P. M., & Fetter, R. (1991). Organizational citizenship behavior and objective productivity as determinants of managerial evaluations of salespersons' performance. Organizational Behavior and Human Decision Processes, 50, 123–150.

Moore, J. E. (2000). Why is this happening? A causal attribution approach to work exhaustion consequences. Academy of Management Review, 25, 335–349.

Morrison, E. W. (1994). Role definitions and organizational citizenship behavior: The importance of employee's perspective. Academy of Management Journal, 37, 1543–1567.

Motowidlo, S. J., & Van Scotter, J. R. (1994). Evidence that task performance should be distinguished from contextual performance. Journal of Applied Psychology, 79, 475–480.

Munene, J. C. (1995). "Not-on-seat": An investigation of some correlates of organizational citizenship behaviour in Nigeria. Applied Psychology: An International Review, 44, 111–122.

Netemeyer, R. G., Johnston, M. W., & Burton, S. (1990). Analysis of role conflict and role ambiguity in a structural equations framework. Journal of Applied Psychology, 75, 148–157.

Organ, D. W., & Paine, J. B. (1999). A new kind of performance for industrial and organizational psychology: Recent contributions to the study of organizational citizenship behavior. In C. L. Cooper & I. T. Robertson (Eds.), International review of industrial and organizational psychology (Vol. 14; pp. 337–368). West Sussex: Wiley.

Parker, P. A., & Kulik, J. A. (1995). Burnout, self- and supervisor-related job performance, and absenteeism among nurses. Journal of Behavioral Medicine, 18, 581–599.

Pines, A., & Aronson, E. (1988). Career burnout: Causes and cures. New York: Free Press.

Podsakoff, P. M., & MacKenzie, S. B. (1994). Organizational citizenship behaviors and sales unit effectiveness. Journal of Marketing Research, 31, 351–363.

Randall, M., & Scott, W. A. (1988). Burnout, job satisfaction, and job performance. Australian Psychologist, 23, 335–347.

Sargent, L. D., & Terry, D. J. (2000). The moderating role of social support in Karasek's job strain model. Work & Stress, 14, 245–261.

Schaubroeck, J., Cotton, J. L., & Jennings, K. R. (1989). Antecedents and consequences of role stress: A covariance structure analysis. Journal of Organizational Behavior, 10, 35–58.

Schaubroeck, J., & Fink, L. S. (1998). Facilitating and inhibiting effects of job control and social support on stress outcomes and role behavior: A

contingency model. Journal of Organizational Behavior, 19, 167–195.

Schaufeli, W. B., Bakker, A. B., Hoogduin, K., Schaap, C., & Kladler, A. (2001). On the clinical validity of the Maslach Burnout Inventory and the Burnout Measure. Psychology & Health, 16, 565–582.

Schaufeli, W. B., & Enzmann, D. (1998). The burnout companion to study and practice: A critical analysis. London: Taylor and Francis.

Schnake, M. (1991). Organizational citizenship: A review, proposed model, and research agenda. Human Relations, 44, 735–759.

Schreurs, P. J. G., & Taris, T. W. (1998). Construct validity of the demand-control model: A double cross-validation approach. Work & Stress, 12, 66–84.

Schumacker, R. E., & Lomax, R. G. (1996). A beginner's guide to structural equation modeling. Mahwah, NJ: Erlbaum.

Shirom, A. (1989). Burnout in work organizations. In C. L. Cooper & I. Robertson (Eds.), International review of industrial and organizational psychology (pp. 25–48). Chichester: Wiley.

Shirom, A. (2002). Job related burnout: A review. In J. C. Quick & L. E. Tetrick (Eds.), Handbook of occupational health psychology (pp. 245–264). Washington, DC: American Psychological Association.

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

Singh, J., Goolsby, J. R., & Rhoads, G. K. (1994). Behavioral and psychological consequences of boundary spanning burnout for customer service representatives. Journal of Marketing Research, 31, 558–569.

Smith, C.A., Organ, D.W., & Near, J.P. (1983). Organizational citizenship behavior: Its nature and antecedents. Journal of Applied Psychology, 68, 653–663.

Ursin, H. (1980). Personality, activation and somatic health: A new psychosomatic theory. In S. Levine & H. Ursin (Eds.), Coping and health (pp. 259–279). New York: Plenum Press.

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.

Van Veldhoven, M., & Meijman, T. F. (1994). Het meten van psychosociale arbeidsbelasting met een vragenlijst: De vragenlijst beleving en beoordeling van de arbeid [The measurement of psychosocial strain at work: The questionnaire experience and evaluation of work]. Amsterdam: NIA.

Veldhuizen, I. J. T., Gaillard, A. W. K., & de Vries J. (2003) The influence of mental fatigue on facial EMG activity during a simulated workday. Biological Psychology, 63, 59–78.

Warr, P. B. (1990). Decision latitude, job demands, and employee well-being. Work and Stress, 4, 285–294.

Wayne, S. J., Shore, L. M., & Liden, R. C. (1997). Perceived organizational support and leader-member exchange: A social exchange perspective. Academy of Management Journal, 40, 82–111.

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

Wright, T. A., & Bonett, D. G. (1997). The contribution of burnout to work performance. Journal of Organizational Behavior, 18, 491–499.

Wright, T. A., & Cropanzano, R. (1998). Emotional exhaustion as a predictor of job performance and voluntary turnover. Journal of Applied Psychology, 83, 486–493.

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.