Journal of Applied Psychology
2001, Vol 86, No 3 499-512

0021-9010/01/$5 00 DOI 10 1037//0021-9010 86 3 499

The Job Demands–Resources Model of Burnout

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The job demands–resources (JD-R) model proposes that working conditions can be categorized into 2 broad categories, job demands and job resources, that are differentially related to specific outcomes. A series of LISREL analyses using self-reports as well as observer ratings of the working conditions provided strong evidence for the JD-R model. Job demands are primarily related to the exhaustion component of burnout, whereas (lack of) job resources are primarily related to disengagement Highly similar patterns were observed in each of 3 occupational groups' human services, industry, and transport (total N = 374) In addition, results confirmed the 2-factor structure (exhaustion and disengagement) of a new burnout instrument—the Oldenburg Burnout Inventory—and suggested that this structure is essentially invariant across occupational groups.

Several authors have challenged the prevailing view that burnout is to be found exclusively in the human services, such as social work, health care, and teaching (Maslach & Schaufeli, 1993). Nevertheless, working with people has come to be seen as intrinsic to burnout simply because most authors have only looked at those situations where the occupation requires working with people. The central aims of the present research are to address problems in the conceptualization and measurement of burnout that have encouraged this selective focus and to provide evidence of burnout outside the human services. Two basic arguments exist for this contention.

First, there is little theoretical rationale for limiting burnout to human service professions (see also Maslach & Leiter, 1997; Schaufeli & Enzmann, 1998). Second, ample empirical evidence shows that the stressors that may lead to burnout in the human services can be found in other work settings as well (Buunk, De Jonge, Ybema, & de Wolff, 1998; Kahn & Byosiere, 1992). The model of burnout proposed and tested in the present research—the job demands-resources (JD-R) model—assumes that burnout develops irrespective of the type of occupation when job demands are high and when job resources are limited because such negative working conditions lead to energy depletion and undermine employees' motivation, respectively.

Is Burnout Specific to the Human Services?

The most influential definition of burnout has been offered by Maslach (1982), who characterized burnout as a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among people who do "people work" of some kind. Emotional exhaustion refers to feelings of being overextended and exhausted by the emotional demands of one's work. Depersonalization is characterized by a detached and cynical response to the recipients of one's service or care. Finally, reduced personal accomplishment refers to the self-evaluation that one is no longer effective in working with recipients and in fulfilling one's job responsibilities (Maslach, Jackson, & Leiter, 1996). Thus, Maslach's (1982) original definition of burnout restricts the syndrome to the human services, in other words, to professionals who work in jobs where the primary process consists of "processing" people, rather than things or information.

A closer look at each of the three burnout dimensions of Maslach (1982) reveals that they can be reformulated in terms that are more general. Conceptually speaking, emotional exhaustion closely resembles traditional stress reactions that are studied in occupational stress research, such as fatigue, job-related depression, psychosomatic complaints, and anxiety (see Buunk et al., 1998; Kahn & Byosiere, 1992; Warr, 1987). Indeed, several studies have shown considerable overlap between emotional exhaustion and such stress reactions (Schaufeli & Enzmann, 1998) Perhaps even more important, emotional exhaustion has been related to similar job stressors (e.g., workload, role problems) and similar attitudinal and behavioral outcomes (e g , turnover intentions, absenteeism) as more orthodox stress reactions (for a meta-analysis, see Lee & Ashforth, 1996). As a matter of fact, these general job demands are more strongly related to emotional exhaustion than are more specific emotional demands, such as con-

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This study was supported by the German Academic Exchange Service and by Grant 580-02-202 from the Dutch Organization for Scientific Research as part of the research program Fatigue at Work

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frontation with death and dying, severity of client problems, and so on (Schaufeli & Enzmann, 1998, pp. 84–85).

Viewed from a similar broad perspective, depersonalization can be characterized as a specific kind of withdrawal or mental distancing from recipients, which in other jobs may manifest itself as alienation, disengagement, or cynicism concerning the job and the work role (see also Cherniss, 1980). For example, Aronowitz (1973) observed among industrial workers the need to distance oneself psychologically from the job. Also, managers whose expectations regarding career success are frustrated have been found to respond with alienation or estrangement (e.g., Lang, 1985). Karger (1981) has pointed out that conceptually speaking, *alienation* in non–human-service jobs is similar to depersonalizing recipients in the human services. Moreover, the development over time of employee *cynicism* (Kanter & Mirvis, 1989) strongly resembles the way in which the process of burnout in the human services has been described in terms of several stages (e.g., Edelwich & Brodsky, 1980).

The third classical burnout component, feelings of reduced personal accomplishment—or professional efficacy, in more general terms—is not considered to be a separate dimension in the proposed model for several reasons. First, emotional exhaustion and depersonalization are generally considered to be the core dimensions of burnout (Green, Walkey, & Taylor, 1991). Second, a recent meta-analysis has shown that emotional exhaustion and depersonalization are much more strongly correlated with each other than with personal accomplishment (Lee & Ashforth, 1996). Third, personal accomplishment is the weakest burnout dimension in terms of significant relationships with other variables (for overviews, see Lee & Ashforth, 1996; Schaufeli & Enzmann, 1998). These empirical results support the notion that emotional exhaustion and depersonalization constitute a syndrome, which is loosely related to personal accomplishment. Shirom (1989) interprets feelings of reduced personal accomplishment as a possible consequence of the core negative emotional experience of burnout. Other authors (Cordes & Dougherty, 1993; Lee & Ashforth, 1990) have suggested that on a theoretical level, personal accomplishment reflects a personality characteristic similar to self-efficacy (Bandura, 1986).

In sum, there appears to be sufficient theoretical rationale to expand burnout beyond the human service professions. It is likely that the core dimensions of burnout as found in the human services—emotional exhaustion and depersonalization—are particular manifestations of more generic phenomena—exhaustion and disengagement—that may be found in other occupational fields as well.

Measuring Burnout Outside the Human Services

To date, the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986, Maslach et al., 1996) is almost universally used as the instrument to assess burnout (Schaufeli & Enzmann, 1998). The original MBI, designed to be used with human service populations, includes three subscales that measure the three dimensions incorporated in Maslach's (1982) definition of burnout (i.e., emotional exhaustion, depersonalization, and personal accomplishment).

Recently, Schaufeli, Leiter, Maslach, and Jackson (1996) developed the Maslach Burnout Inventory—General Survey (MBI–GS), which includes three more generic burnout dimensions labeled *exhaustion*, *cynicism*, and *professional efficacy*. These MBI–GS subscales clearly parallel those of the MBI. However, the MBI–GS includes different items that refer to more general, nonsocial aspects of the job. Studies in Canada (Leiter & Schaufeli, 1996) support the invariance of the MBI–GS's factor structure across various occupational groups, including maintenance workers, nurses, software engineers, and managers. In addition, the factorial structure was largely invariant across workers from the same company who are employed in three different countries: the Netherlands, Sweden, and Finland (Schutte, Toppinen, Kalimo, & Schaufeli, 2000).

However, the MBI–GS still suffers from the same problem as the original version of the MBI, namely that the items in each subscale are all phrased in the same direction; that is, all exhaustion and cynicism items are phrased negatively, whereas all professional-efficacy items are phrased positively. From a psychometric point of view, such one-sided scales are inferior to scales that include both positively and negatively worded items (cf. Guilford, 1954), because this will increase acquiescence tendencies and thus can lead to artificial factor solutions in which positively and negatively worded items are likely to cluster (Doty & Glick, 1998). The MBI has indeed been criticized for this weakness (Demerouti & Nachreiner, 1996, Lee & Ashforth, 1990).

In the present article, we therefore use an alternative measure of burnout, the Oldenburg Burnout Inventory (OLBI; Demerouti, 1999). The OLBI was constructed and validated among different occupational groups (Demerouti & Nachreiner, 1998) at the same time that the MBI–GS was developed. The OLBI includes two dimensions: *exhaustion* and *disengagement from work*.[1] Exhaustion is defined as a consequence of intensive physical, affective, and cognitive strain, for example as a long-term consequence of prolonged exposure to certain demands. This conceptualization is quite similar to other definitions of exhaustion that have been proposed (Aronson, Pines, & Kafry, 1983, Lee & Ashforth, 1993; Shirom, 1989). Contrary to exhaustion as operationalized in the original MBI or MBI–GS, the OLBI covers not only affective but also physical and cognitive aspects of exhaustion. This makes it

[1] Evidence for the convergent validity of the OLBI has been found in a recent study among 232 Greek employees from various occupations (Demerouti, Bakker, Vardakou, & Kantas, 2001). In this study, employees filled out both the MBI–GS and the OLBI. Results of a series of confirmatory factor analyses showed that a model including exhaustion and negative attitudes as second-order latent factors and MBI–GS–professional efficacy as a first-order latent factor showed an acceptable fit to the data. In this model, the first-order latent factors OLBI–exhaustion and MBI–GS–exhaustion loaded significantly and equally highly on the second-order factor exhaustion, whereas OLBI–disengagement and MBI–GS–cynicism loaded significantly and high on the second-order factor negative attitudes. All items of the OLBI and the MBI–GS were included in the model as manifest variables. These findings suggest that exhaustion, as measured by the OLBI, closely resembles exhaustion as measured by the MBI–GS and that OLBI–disengagement closely resembles MBI–GS–cynicism. In fact, the bivariate correlation between OLBI–exhaustion and MBI–GS–exhaustion was .60. Exactly the same correlation was found between OLBI–disengagement and MBI–GS–cynicism. In other words, the two core dimensions of the OLBI and the MBI–GS, although using slightly different conceptualizations, share substantial amounts of common variance.

more applicable to those workers who perform physical work and to those whose job is mainly about processing information, especially because there is something more related to feelings of exhaustion than just emotions—even in the service sector.

Whereas depersonalization in the original MBI refers to distancing oneself emotionally from service recipients, disengagement in the OLBI refers to distancing oneself from one's work, and experiencing negative attitudes toward the work object, work content, or one's work in general. Although the depersonalization scale includes attitudes that refer to recipients (e.g., becoming impersonal, callous, hardening), the disengagement scale refers to attitudes toward the work task (e.g., uninteresting, not challenging) as well as to a devaluation and mechanical execution of work. Furthermore, disengagement items concern the relationship between the employee and his or her job, especially regarding engagement and identification.

Finally, a distinctive feature of the OLBI compared with the MBI–GS (and the original MBI) is that according to good psychometric practice, the OLBI scales each include both negatively and positively worded items. That is, both exhaustion and disengagement are measured via sets of items that require both affirmative and negating responses.

Stressors Within and Outside the Human Services and Their Relation to Burnout

A strong argument for the contention that burnout may exist in any type of occupation is that there is ample empirical evidence showing that similar stressors that may lead to burnout in the human services may lead to comparable stress reactions in non–human-service professions, such as job-related depression, anxiety, and psychosomatic complaints (for a review, see Kahn & Byosiere, 1992). Moreover, several studies have shown that high job demands may cause both emotional exhaustion and job-related depression and anxiety within and outside the human services (e.g., Buunk et al., 1998; De Jonge & Schaufeli, 1998; Warr, 1990). As far as job demands are concerned, relationships between human service burnout (particularly emotional exhaustion) and, amongst others, work overload, time pressure (for reviews, see Cordes & Dougherty, 1993; Lee & Ashforth, 1996), and an unfavorable physical environment (e.g., Friedman, 1991) are well documented.

In a somewhat similar vein, relationships have been found between human service burnout (particularly depersonalization) and poor job resources such as lack of social support (e.g., Leiter, 1991, Leiter & Maslach, 1988), skill underutilization (e.g., Leiter, 1990), low job control (e.g., De Jonge & Schaufeli, 1998; De Rijk, Le Blanc, Schaufeli, & De Jonge, 1998), and poor performance feedback (e.g., Maslach & Jackson, 1986). Again, in earlier studies among employees in various occupations, exactly the same resources have been related to a wide range of withdrawal reactions, such as reduced organizational commitment, turnover, and alienation (for reviews, see Buunk et al., 1998, Kahn & Byosiere, 1992). In conclusion, empirical evidence suggests that commonly found job stressors play a significant role in burnout and that commonly found stress reactions have similar antecedents as burnout.

The JD-R Model of Burnout

Stress is defined in terms of a disruption of the equilibrium of the cognitive–emotional–environmental system by external factors (Lazarus & Folkman, 1984, McGrath, 1976). These external factors, traditionally called stressors, may also lead to an equilibrium of the cognitive and environmental system or a state of well-being, depending on the performance capacities, for example, the available coping resources within the individual at a given time. Therefore, we prefer to use the term *stressor* only when an external factor has the potential to exert a negative influence on most people in most situations.

Job demands refer to those physical, social, or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs (e.g., exhaustion). According to Hockey's (1993) control model of demand management, individuals use a performance-protection strategy under the influence of environmental stressors (e.g., noise, heat, workload, and time pressure). These stressors correspond with the job demands in our model. Performance protection is achieved through the mobilization of sympathetic activation (autonomic and endocrine), increased subjective effort (use of active control in information processing), or both (cf. Hockey, 1993). The greater the activation or effort, the greater the physiological costs for the individual. Although the operation of this strategy makes it difficult to demonstrate overt decrements in primary task performance, according to Hockey's theory, several different patterns of *indirect* degradation may be identified. These are referred to as strategy adjustments (narrowing of attention, redefinition of task requirements) and fatigue after-effects (risky choices, high subjective fatigue) The long-term effect of such a compensatory strategy may be a draining of an individual's energy and a state of breakdown or exhaustion.

Whereas theories about the development of fatigue explain the relationship between demands and exhaustion, the relationship between resources and disengagement may be explained by theories about health promotion and maintenance (e.g., Antonovski, 1987). The basic question of such theories is what keeps people healthy, even after they encounter high degrees of workload (Richter & Hacker, 1998). The answer is health-protecting factors, called *resources. Job resources* refer to those physical, psychological, social, or organizational aspects of the job that may do any of the following: (a) be functional in achieving work goals, (b) reduce job demands at the associated physiological and psychological costs; (c) stimulate personal growth and development. Richter and Hacker (1998) distinguish resources in two categories, namely, external resources (organizational and social) and internal resources (cognitive features and action patterns). In our study, we focus on external resources because there is no general agreement regarding which internal resources can be considered stable or situation independent—and which can be changed by adequate job design. Organizational resources include job control, potential for qualification, participation in decision making, and task variety. Social resources refer to support from colleagues, family, and peer groups. When the external environment lacks resources, individuals cannot cope with the negative influences of environmental demands (like high workload), and they cannot obtain their goals We believe that in such a situation, a reduction of motivation and withdrawal from the job can be important self-protection mecha-

nisms that may prevent future frustrations of not obtaining work-related goals.

In sum, the JD-R model proposes that the development of burnout follows two processes (see Figure 1). In the first process, demanding aspects of work (i.e., extreme job demands) lead to constant overtaxing and in the end, to exhaustion. In the second process, a lack of resources complicates the meeting of job demands, which further leads to withdrawal behavior. The long-term consequence of this withdrawal is disengagement from work Theoretically, one may argue that the *interaction* between job demands and job resources is most important for the development of burnout, that is, of exhaustion *and* disengagement. However, there is little empirical evidence for such an interaction effect (cf. Hockey, 1993). For example, very few studies on Karasek's (1979) job demand–control model have supported the predicted interaction between job demands and job control (De Jonge & Kompier, 1997). Therefore, in our study, we concentrate on the unique contribution of job demands and job resources to explaining variance in each burnout component.

The Present Study

The present research had two goals, (a) to establish the factorial validity of the OLBI, an instrument that measures burnout independent of the occupational context and (b) to test the JD-R model of burnout. The JD-R model assumes that job demands are most predictive of feelings of exhaustion, whereas lacking job resources is most predictive of disengagement from work. It is important to note that the relative contribution of specific job demands and resources to explaining burnout may vary across occupations because job demands as well as access to job resources may differ. Therefore, the model is validated in different occupational groups in which employees work primarily with people (teachers and nurses), things (production line workers), or information (air traffic controllers and control room operators).

Although the importance of obtaining both objective and subjective measures of the working environment is often asserted, it is seldom enacted (Kahn & Byosiere, 1992). To validate our findings, the present study uses observer ratings of the working conditions in addition to self-reports. The second source of data and the second level of analysis were added to avoid method artifacts caused by using only one single method or to find relations (within the individual) that can be predicted by merely applying principles of cognitive consistency (Doty & Glick, 1998). The observations concern working conditions of job *prototypes*, which represent groups of individual job positions at the same location, with (roughly) the same task and working conditions and with the same supervisor. Thus, in this situation, working conditions are considered traits of a job (prototype) and not of the individual, and the level of analysis is the job. The analysis has been restricted to prototypes of jobs because going to individual jobs would have required analyzing each individual job separately and using an instrument that is sensitive enough to discriminate the differences between these individual jobs. Before investing the enormous effort required for such an investigation, this study restricted itself to a first test of the model at a prototypical level of the job. Because burnout is usually measured at the individual level and global measures of job burnout do not exist, we had to rely on aggregated data for the job from the lower, individual level (cf. Chan, 1998). The theoretical assumption for the aggregation of the individual burnout scores is that even though individuals of a work group may experience different burnout levels (because of individual differences), common (effect) variance in group scores may exist because of common working conditions, with individual differences representing error variance. Because burnout is conceived as a work-related syndrome, we expect within-group agree-

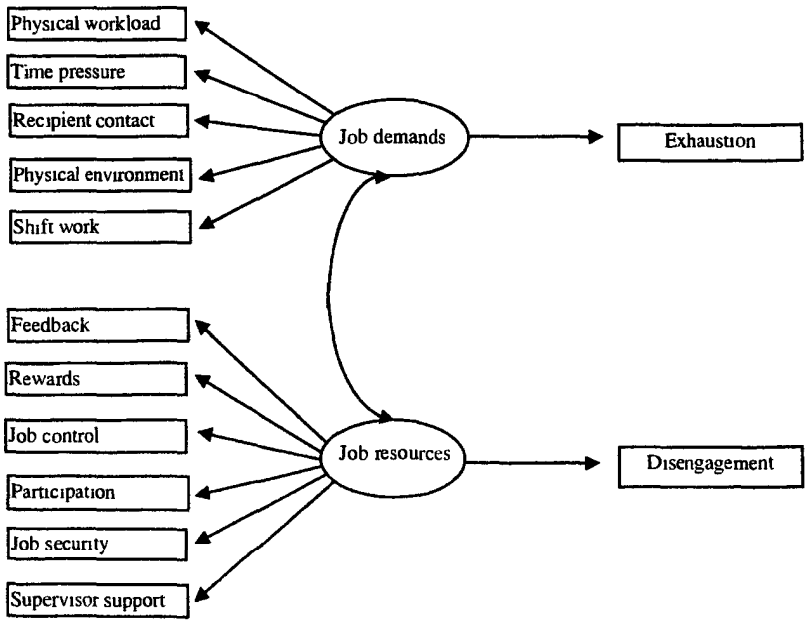

Figure 1 The job demands–resources model of burnout

ment and between-job (group) variance in burnout scores, because people in different work settings will tend to agree rather than disagree (Schneider & Reichers, 1983). If burnout is caused by unfavorable working conditions, within-group agreement will exist, and the meaning of job burnout will be in the consensus among individuals In Chan's (1998) typology, this is described as direct-consensus composition. In terms of analysis of variance, it is a question of between-job variance in burnout (with the within-job variance treated as error variance), which can be expected if working conditions are sufficiently different.

Hypotheses

1. The two-factor structure of the OLBI is invariant across occupations within and outside the human services.
2. Job demands are primarily and positively related to exhaustion, whereas job resources are primarily and negatively related to disengagement from work.
3. Hypothesis 2 will hold for subjectively experienced job demands and job resources (the unit of analysis is the individual), as well as for independent-observer ratings of the same job demands and job resources (the unit of analysis is the job position).
4. Although the structural relationships in the JD-R model of burnout are invariant across the three different occupational groups, the importance of the specific job demands and job resources included in the model will vary across groups.

Method

Participants and Procedure

Participants were 374 employees from the northern part of Germany who were employed in one of 21 different jobs in three different occupational fields human services (37 teachers and 108 nurses in cardiology, surgery, oncology, neonatal care, intensive care, and hospices), industry (109 assembly line workers in manufacturing industries and in the development of photo prints and 25 control room operators from the chemical industry), and transport (95 air traffic controllers [ATCs] from three different airports) In the first subsample (nine jobs), employees work mainly with people; in the second (nine jobs), mainly with things or information; and in the third (three jobs), mainly with information (and secondarily with people). Half of the sample was male (51%), and the mean age was 36 years (SD = 8.9). The mean working experience was 11 years (SD = 8 0), and mean organizational tenure was 7 years (SD = 6.4). Twelve percent of the sample worked in a supervisory function, and 70% worked shifts.

Participants were recruited at their workplace after informative meetings with representatives of the management, personnel departments, and workers' councils of the 12 different organizations involved After a brief introduction of the study in which the confidentiality and anonymity of the answers were emphasized, the first author distributed self-report questionnaires and envelopes among 665 employees. Fifty-six percent of the questionnaires were returned in a special box at the workplace. The response rate was somewhat higher in the ATC sample (62%) compared with the human services sample (55%) and the industry sample (54%)

In addition, an observer rated specific dimensions of the working conditions in the 21 job prototypes. To estimate the reliability of these ratings, a second observer independently assessed 9 of the 21 positions as well Both observers spent approximately 4 hours at each job to conduct interviews with supervisors and to observe employees during their work The interviews concerned the daily tasks and the task structure as well as dimensions that could not be observed (e g , salary, shift schedules). The observation included following two different employees during their task execution, attending meetings (when available), and observing the workplace. Immediately after completing this procedure, each rater individually filled out a job description instrument (checklist)

Measures

Individual burnout The OLBI measures burnout on two dimensions· exhaustion and disengagement [2] The 7 items of the exhaustion subscale 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 my work, I usually feel totally fit for my leisure activities" (reversed). Three items are 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 comprises eight items, including "I usually talk about my work in a derogatory way" and "I get more and more engaged in my work" (reversed) Identical answering categories (1 = *totally disagree,* 4 = *totally agree*) as for exhaustion were used Three items are positively worded and five negatively Cronbach's alphas of the exhaustion and disengagement scales were 82 and 83, respectively The correlation between both subscales was .39 ($p < 001$)

The OLBI has been constructed and validated in an independent study among 293 German employees from different occupational fields, including human service professionals and blue-collar workers (Demerouti & Nachreiner, 1999) A factor analysis confirmed its two-dimensional factor structure. Discriminant and convergent validity was examined by relating the OLBI to items from the BMS (*Belastung, Monotonie, Sattigung,* Plath & Richter, 1984), a reliable and valid German questionnaire measuring short-term effects of strain at work such as mental fatigue, monotony, satiation, and stress reactions (for definitions, see International Organization for Standardization, 1991). The results of a series of first- and second-order factor analyses supported the OLBI's discriminant validity· Both burnout dimensions could, for example, be discriminated from measures of mental fatigue and satiation. More specifically, it was found that the items of both burnout subscales loaded on the intended separate factors, whereas the items from the BMS subscales loaded on other factors. Furthermore, the study of Demerouti & Nachreiner (1999) supported the *convergent validity* of the OLBI by showing that both burnout dimensions were only related to the conceptually most relevant constructs Exhaustion was significantly related to mental fatigue (r = .52, $p < 05$) but not to satiation (r = 00), whereas disengagement was significantly related to satiation (r = .53, $p < .05$) but not to mental fatigue (r = −.10, *ns*).

Job demands and job resources For the subjective evaluation of the working conditions, 11 theoretically derived working conditions were included in the questionnaire (see Demerouti, 1999, for details) Each item assessed heterogeneous aspects of each working condition (e.g., control over tools, time, and methods) Thus, we did not aim at constructing internally consistent scales for each of the working conditions The five job demands included in this research were physical workload (one item· "My work does not tax me too much physically"; cf. Semmer, 1984), time pressure (one item; "I always have enough time to perform my tasks", cf Karasek, 1985), demanding contact with the recipients of one's services or work products (two items; e.g., "My contact with persons to whom I have to offer services is demanding", cf Semmer, 1984), unfavorable shift-work schedule for physical health, family, and social life (two items, e g . "It is physically taxing for me to get used to my working times"; cf Schonfelder, 1992), and physical environment (two items, e g , "My physical working conditions—climate, light, noise, design of the working place, and material—are all right", cf Semmer, 1984) The six job resources included in

[2] The German questionnaire and an English translation are available from Evangelia Demerouti on request

the study were performance feedback (two items, e.g., "I get enough feedback about the quality of my performance"; Hackman & Oldham, 1975), rewards (two items; e.g., "My performance is rewarded properly"), job control (three items, e.g., "I can decide myself how to perform my work"; Karasek, 1985; Smith & Alnick, 1989), participation in decision making (one item: "Only the management decides what everybody has to do"), job security (one item; "The threat of losing this job is very low"; Semmel, 1984), and supervisor support (two items, e.g., "My supervisor keeps distance from his/her employees", cf. Chemiss, 1980). Participants were asked to indicate the extent to which they agreed with each statement using the same 4-point scale (1 = *totally disagree*, 4 = *totally agree*) as with the OLBI items. Responses were coded such that higher scores referred to higher job demands and more job resources, respectively.

Job demands and resources were further assessed by an observer, who used a job description checklist that was developed for the present study to evaluate the 21 different job positions. The checklist measured the same working conditions as those included in the questionnaire, and the number of items ranged between one to six for each working condition. The interrater reliabilities—estimated via intraclass correlation coefficients—ranged between .87 and .96, and the correlations between the ratings for the jobs ranged from .78 to .93. In addition, results of a three-way analysis of variance (Raters [2] × Job Position [9] × Job Description Item [62]), according to the methodology of Arvey and Mossholder (1977), showed that no main effect for raters could be found, $F < 1$, *ns*.

Results

Confirmatory Factor Analyses

To test Hypothesis 1, we first established the dimensionality of the OLBI in the whole sample (after eliminating cases with missing values, leaving an N of 352) with confirmatory factor analysis (CFA). Second, using multigroup CFA, we tested the invariance of the two-factor structure of the OLBI across occupations. Because the multigroup CFA only provides overall fit indices, we further conducted a CFA for each subsample separately to see how well the two-factor model fit in each subsample. Third, we estimated whether each subsample had equivalent factor variances, factor loadings, and error variances (see Jöreskog & Sörbom, 1993). All analyses were performed with the AMOS computer program (Arbuckle, 1997). The maximum-likelihood method was used to examine the covariance matrix of the items. The analysis assessed the factor structure with the goodness-of-fit index (GFI) and the root-mean-square residuals (RMR). In addition, AMOS provides several fit indices that reflect the discrepancy between the hypothesized model and the baseline model (the null model). In the present series of analyses, the normed fit index (NFI), the comparative fit index (CFI), and the incremental fit index (IFI; Bollen, 1989) are used. In general, models with fit indices ≥ .90 and an RMR ≤ .05 indicate a good fit.

Several plausible models were compared. In the proposed model, the two burnout factors were allowed to correlate. In the so-called wording model, all positively phrased items of both burnout dimensions were specified to load on one factor and all negatively phrased items on a second factor. With this model, we were able to examine to what extent the factor structure is an artifact of the scale construction. Finally, in the one-factor model, the indicators of exhaustion and disengagement were specified to load on the same factor, that is, one hypothetical burnout factor.

Table 1 (Total sample section) displays the results of the CFA for the whole sample. The proposed two-factor model, with correlated factors and no cross-loadings, provided a good fit to the data. Four fit indices have values ≥ .90, and the RMR is .04. Moreover, the proposed two-factor model fitted better to the data than did the wording model: All fit indices of the proposed model have higher values, and its chi-square value is 150.87 points lower, with equal degrees of freedom. Furthermore, the one-factor model provided a less satisfactory fit than the proposed model, $\Delta\chi^2(2, N = 352) = 170.28, p < .001$. All items loaded significantly ($p < .05$) on the predicted factors. Figure 2 displays the factor loadings and the correlations between the factors.

Comparable are the results of the multigroup CFA for the three subsamples (Table 1, Multigroup section). The proposed two-factor model fits more closely to the data than the wording model (its chi-square value is 112.85 points lower with equal degrees of freedom) and better than the one-factor model, $\Delta\chi^2(3, N = 352) = 134.54, p < .001$. The correlations between the two factors for the human service, transport, and industry subsamples were .53, .43, and .70, respectively. Furthermore, Table 1 (Human services, Transport, and Production sections) displays the fit indices of the different models for each subsample separately. Again, the proposed model fitted better than the alternative models for all subsamples. The model fits about equally well to the data of each subsample.

Table 2 shows the results of the equivalence test of the factor variances, factor loadings, and error variances of the three subsamples. The model that allows all parameters to be different in the subsamples is significantly better than the model that requires equal factor variances, $\Delta\chi^2(4, N = 352) = 10.18, p < .05$, as well as the model with equal error variances, $\Delta\chi^2(31, N = 352) = 106.12, p < .001$. However, the factor loadings are equivalent between the three subsamples because the free model is not significantly better than the model with equal factor loadings, $\Delta\chi^2(26, N = 352) = 37.52$, *ns*. In conclusion, results of a series of CFA provide evidence for Hypothesis 1 by showing that the proposed two-factor structure of the OLBI can be replicated in the total sample, as well as across occupations within and outside the human services.

The next step in the analyses was to conduct a test of the dimensionality of the JD-R 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, $\chi^2(137, N = 374) = 340.71$, GFI = .91, RMR = .05, NFI = .60, CFI = .83, IFI = .84. 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 (e.g., the general working environment), $\Delta\chi^2(1, N = 374) = 12.03, p < .001$. Moreover, the proposed model also fitted more closely to the data than the model including only first-order latent factors (the working conditions) and no second-order latent factors, $\Delta\chi^2(9, N = 374) = 104.75, p < .001$.

Test of the JD-R Model of Burnout

According to Hypothesis 2, job demands were expected to be positively related to exhaustion and job resources, negatively to

Table 1
Indices of Overall Fit for Alternative Factor Structures of the OLBI: Results of CFA for the Total Sample, Multigroup CFA for Three Independent Samples, and CFA for the Three Samples Separately

Model	χ^2	*df*	*p*	GFI	RMR	NFI	CFI	IFI
			Total sample					
Proposed model	109.55	73	004	.96	04	94	98	98
Wording model	260 42	73	.001	.89	.06	86	.89	.89
One-factor model	279 83	75	001	.87	07	85	88	88
Null model	1.828.61	105		.42	.22			
			Multigroup					
Proposed model	303.00	219	001	90	05	.84	95	.95
Wording model	415 85	219	.001	86	.06	77	87	88
One-factor model	437 54	222	.001	85	.06	.76	86	87
Null model	1,841 06	315		.45	.20			
			Human services					
Proposed model	106 17	73	007	.91	05	.84	.94	94
Wording model	153 11	73	001	.87	.06	76	85	.86
One-factor model	159 72	75	001	86	.07	75	.84	85
Null model	642.80	105		.49	.17			
			Transport					
Proposed model	83 06	73	.197	90	04	.79	.96	97
Wording model	98 82	73	024	87	.05	75	91	92
One-factor model	113.88	75	003	86	.05	71	86	.88
Null model	386.94	105		56	12			
			Production					
Proposed model	94 39	73	047	91	05	.88	.97	97
Wording model	126.10	73	.001	87	07	.84	92	93
One-factor model	139 83	75	.001	86	.07	.83	.91	91
Null model	806.18	105		35	.29			

Note. Sample sizes are as follows: total sample and multigroup, $N = 352$ each; human services, $N = 140$, transport, $N = 119$; production, $N = 93$. OLBI = Oldenburg Burnout Inventory; CFA = confirmatory factor analysis. GFI = goodness-of-fit index, RMR = root-mean-square residual; NFI = normed fit index; CFI = comparative fit index; IFI = incremental fit index

disengagement (see also Figure 1). To test the JD-R model, structural equation modeling (SEM; Joreskog & Sörbom, 1993) was used. The 11 working conditions were classified into two latent factors, one representing job demands and the other job resources, and treated as exogenous variables in the model. In addition, the two burnout dimensions—exhaustion and disengagement—were defined as endogenous variables. The latent factors were allowed to correlate. The rationale for this was that working conditions also covary in reality (e.g., performance feedback with supervisor support). The correlation matrix of the variables involved is displayed in Table 3. The diagonal contains the correlations between each subjectively assessed and observed work characteristic.

Self-reports. The JD-R model of burnout was first tested using the self-reports. The application of multigroup analyses encountered severe identification problems during computation, probably because of substantial differences between the three subsamples regarding the covariances between the error terms of the exogenous variables. This might be due to the different constellations of working conditions in these samples. Therefore, it was decided to pool the data of the three different occupational groups. Results of the SEM analysis showed that the hypothesized model fitted adequately to the data (see upper part of Table 4). All fit indices have values higher than .90, and the RMR is .03. The relationships in the model were as predicted (see first column of Table 5). All specific job demands loaded significantly on the latent-factor job demands, and all specific job resources loaded significantly on the latent-factor job resources. In addition, the coefficient of the path from job demands to exhaustion was highly positive and significant, whereas the coefficient of the path from job resources to disengagement was highly negative and significant (see lower part of Table 5). The JD-R model of burnout explains 82% of the variance in exhaustion and 52% of the variance in disengagement. The standardized solution of the JD-R model of burnout for the whole sample is graphically presented in Figure 3.

Because the empirical evidence suggests that emotional exhaustion leads to depersonalization (Bakker, Schaufeli, Sixma, Bosveld, & Van Dierendonck, 2000; Cordes, Dougherty, & Blum, 1997) and that exhaustion leads to cynicism (Leiter & Schaufeli, 1996), we tested an alternative model in which the path from exhaustion to disengagement was added. Results of this analysis

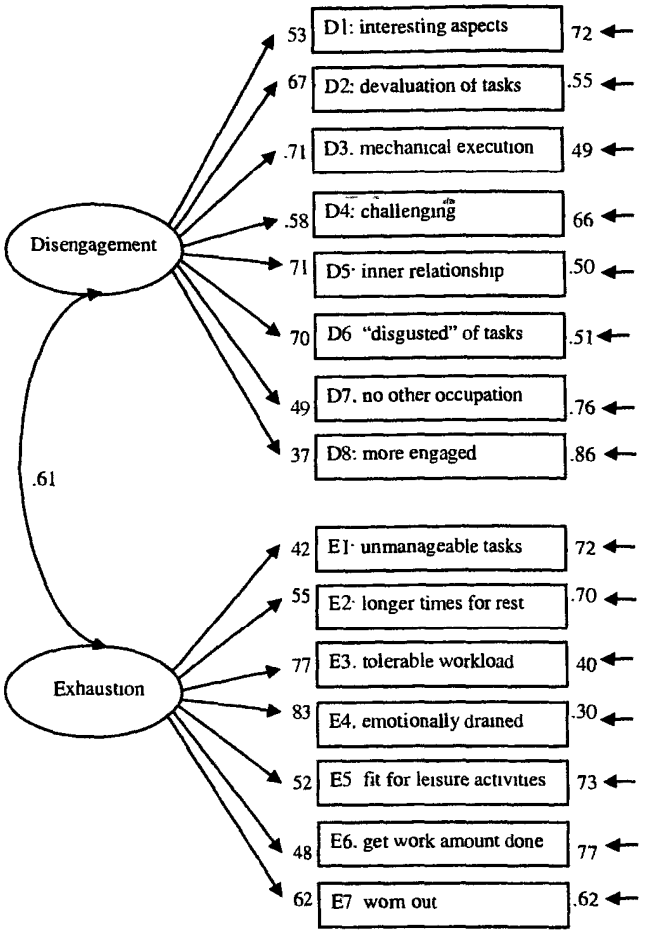

Figure 2. Standardized solution of the confirmatory factor analysis for the Oldenburg Burnout Inventory (total sample)

(see Table 4) showed that this model was not significantly better than the proposed model, $\Delta\chi^2(1, N = 374) = 0.61$, *ns*, and—even more important—that the additional path was not significant ($\beta = .04$).

To test the alternative hypothesis that job demands are related to disengagement and job resources to exhaustion, these two paths were included in the model. As can be seen in Table 4, this alternative (and less parsimonious) Model 2 does not achieve a better fit than the proposed model, $\Delta\chi^2(2, N = 374) = 1.49$, *ns*. Moreover, consistent with Hypothesis 2, *t* tests indicated that the coefficients of the paths from job demands to disengagement ($\gamma = .07$) and from job resources to exhaustion ($\gamma = .04$) were not significant. Taken together, results indicate that the proposed model, including only paths between job demands and exhaustion and between job resources and disengagement, as well as a correlation between the errors of exhaustion and disengagement, is superior to alternative models.

Observer ratings. In a new series of analyses, the JD-R model of burnout was tested using the observer ratings of job demands and job resources and the aggregated (mean) scores of exhaustion and disengagement for participants who had the same job position. To determine whether it is meaningful to speak of job burnout, it is necessary to ascertain whether consistency in burnout scores exists within jobs (cf. Klein, Dansereau, & Hall, 1994). The estimates of within-group interrater reliability (r_{wg}) proposed by James, Demaree, and Wolf (1984), the eta-square (Kerlinger, 1986), and the intraclass correlation coefficients (ICC1; Schrout & Fleiss, 1979) were used for this analysis. The estimates of r_{wg} showed a high level of agreement: 38 of the 42 r_{wg} scores (21 for exhaustion and 21 for disengagement) reached values higher than .70, which is a sufficient amount of agreement (see James, 1987, as cited in George, 1990). Moreover, 34 estimates had values higher than .80, and 18 had values higher than .90. The eta-square for exhaustion was .21, $F(20, 340) = 4.33$, $p < .001$, and for disengagement, .41, $F(20, 340) = 11.69$, $p < .001$, corresponding to ICC1 of .20 and .45 for the total sample and showing that the within-group differences are higher for exhaustion than for disengagement. According to Kenny and La Voie (1985), positive ICC1s indicate that group members are more similar that nongroup members. Hence, there was a remarkable effect due to jobs, which can be assessed with acceptable reliability, thus justifying the use of the group-level construct as a dependent measure of burnout.

Strictly speaking, the sample size (21) in these analyses was not large enough to allow structural equation modeling analyses (cf. Bentler & Chou, 1987). It was nevertheless carried out for exploratory reasons. However, it should be noted that the results are only indicative and should be interpreted with caution.

As can be seen in the lower part of Table 4, the *p* value of the proposed model suggests that the JD-R model does not differ significantly from the data. In addition, the IFI and CFI have acceptable values, but the GFI and NFI values are relatively low. Particularly the GFI is dependent on sample size. Of note, however, is that results of the analyses with the observer ratings are highly similar to the results of the analyses with the self-reports. Again, as predicted, the path from job demands to exhaustion was highly positive and significant, and the path from job resources to

Table 2
Test of the Equality of the Factor Structures Between the Three Samples: Multigroup Confirmatory Factor Analysis (N = 352)

Model	χ^2	*df*	*p*	GFI	RMR	NFI	CFI	IFI
Free parameters	303.00	219	.001	.90	.05	.84	.95	.95
Equal factor loadings	340.52	245	.001	.89	.06	.82	.94	.94
Equal factor variances	313.19	223	.001	.90	.06	.83	.94	.94
Equal error variances	409.12	250	.001	.87	.06	.78	.90	.90

Note GFI = goodness-of-fit index, RMR = root-mean-square residual, NFI = normed fit index, CFI = comparative fit index, IFI = incremental fit index

Table 3
Correlations for the Individual (Below the Diagonal, N = 374) and for the Job (Above the Diagonal, N = 21)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Physical workload	**.26****	.57**	−.21**	−.04	70**	10	.68**	24**	− 18**	15**	−.05	.22**	.27**
2 Time pressure	.32**	**.06**	− 32**	−.21**	.45**	29**	.47**	43**	00	28**	.25**	15**	.34**
3 Recipient contact	.24**	15**	**.12***	.41**	− 10	− 06	− 32**	−.76**	− 65**	− 68**	−.10	− 04	−.43**
4. Shift work	27**	.21**	25**	**.03**	01	− 44**	−.39**	− 08	−.43**	−.32**	− 32**	−.16**	− 39**
5 Physical environment	17**	27**	.23**	.27**	**.09**	42**	.25**	28**	.03	08	30**	26**	24**
6. Feedback	.11*	.07	.22**	.12*	22**	**.24****	.11*	09	39**	.19**	54**	13*	31**
7. Rewards	.20**	.18**	.33**	.22**	25**	.38**	**.45****	.10	−.12*	15**	16**	.20**	.40**
8. Job control	.17**	.16**	.08	18**	.18**	.29**	.13**	**.39****	.60**	69**	.04	− 03	30**
9. Participation	.12*	06	.10	17**	.17**	30**	.19**	.36**	**.38****	.68**	23**	− 04	.27**
10. Job security	03	10	01	08	−.01	21**	.22**	21**	.31**	**.32****	− 10	− 04	.28**
11 Supervisor support	15**	.03	.27**	.16**	24**	.44**	.26**	19**	24**	.16**	**.23****	.14**	.32**
12 Exhaustion	.53**	38**	.39**	45**	32**	.30**	.39**	26**	.23**	08	.23**	—	.40**
13 Disengagement	20**	06	.28**	.32**	22**	46**	37**	38**	.46**	26**	.36**	39**	—

Note. The diagonal (boldface) contains the correlations between each subjectively assessed and observed work characteristic
$^{*}p < .05$ $^{**}p < .01$.

disengagement was highly negative and significant (see Figure 3). In addition, and consistent with results of the self-reports, the first alternative model was not significantly better than the proposed model, $\Delta\chi^2(1, N = 21) = 1.16$, *ns*, and the path from exhaustion to disengagement was not significant. The second alternative model, including the paths from job demands to disengagement and from job resources to exhaustion, did not achieve a better fit than the proposed model, $\Delta\chi^2(2, N = 21) = 1.62$, *ns* Moreover, and again consistent with Hypotheses 2 and 3, *t* tests indicated that the coefficients of the paths from job demands to disengagement ($\gamma = -.13$) and from job resources to exhaustion ($\gamma = -.24$) were not significant. These findings thus support Hypotheses 2 and 3.

Test of the JD-R Model for the Three Occupational Groups Separately

To examine more closely the differences between the occupational groups regarding the goodness-of-fit of the JD-R model, we repeated the structural equation analyses for each subsample separately, using the self-reports. Table 6 displays the results of these analyses. As can be seen, the JD-R model fits best to the data for the human services subsample.

Table 5 (columns 2–4) presents the path coefficients for each subsample separately. In general, results are quite comparable with those for the total sample. However, as predicted in Hypothesis 4, there are some differences regarding the factor loadings of specific job demands and job resources on the latent factors for each occupational group. For example, for the human service and industry sample, physical workload had the highest factor loading on job demands, whereas for the transport sample, physical environment and problems with the shift-work schedule had highest loadings. Furthermore, performance feedback had the highest loading on job resources for the human service and transport samples, whereas job control had the highest loading for the industry sample. Interestingly, a small but significant structural relationship between job demands and disengagement was only found in the production subsample ($\gamma = .35$, $p < .05$).

Table 4
Fit Indices of Alternative Models Using Self-Reports (N = 374) and Observer Ratings (N = 21)

Model	χ^2	*df*	*p*	GFI	RMR	NFI	CFI	IFI
			Self-reports					
Proposed	61 59	42	.026	.98	03	94	98	98
Alternative 1	60.98	41	.023	.98	.03	.95	.98	98
Alternative 2	60.10	40	021	98	.03	95	98	.98
Null	1,105.43	78		.56	13			
			Observer ratings					
Proposed	65 13	49	061	.71	.09	72	89	91
Alternative 1	63 97	48	061	72	10	72	90	.91
Alternative 2	63.11	47	054	.73	10	72	89	91
Null	229.36	78		.33	19			

Note Alternative 1 includes an additional path from exhaustion to disengagement. Alternative 2 includes the paths from job demands to disengagement and from job resources to exhaustion. GFI = goodness-of-fit index, RMR = root-mean-square residual, NFI = normed fit index; CFI = comparative fit index, IFI = incremental fit index

Table 5
Path Coefficients in the Job Demands–Resources Model of Burnout for the Whole Sample and for the Three Samples Separately

Path	Total sample (N = 374)	Human services (N = 145)	Transport (N = 95)	Industry (N = 134)
	Measurement model			
Job demands to				
Physical workload	.57*	56*	.40*	.59*
Time pressure	.40*	51*	32*	.43*
Recipient contact	.42*	.47*	.44*	.47*
Shift work	51*	47*	71*	54*
Physical environment	.33*	.40*	71*	.29*
Job resources to				
Feedback	62*	65*	67*	.51*
Rewards	57*	52*	64*	.44*
Job control	.53*	22*	.29*	62*
Participation	59*	51*	35*	47*
Job security	36*	.00	30*	.12
Supervisor support	43*	.46*	.55*	.46*
	Structural model			
Job demands to,				
Exhaustion	.91*	.83*	.69*	.91*
Disengagement[a]	.07	−.04	−.13	.35*
Job resources to				
Exhaustion[a]	.04	−.06	−.04	.15
Disengagement	−.72*	−.67*	−.41*	−.70*

[a] Coefficients of the paths from job demands to disengagement and from job resources to exhaustion are provided by the analysis with the alternative model.
* $p < .05$

Discussion

The present article makes two theoretical contributions. First, although several authors have argued that burnout may be found in any occupation (e.g., Cordes & Dougherty, 1993; Golembiewski, Boudreau, Munzenrider, & Lou, 1996, Lee & Ashforth, 1996, Shirom, 1989), the present study is one of the first to provide empirical evidence for this contention by including employees from occupational fields within and outside the human services. Results of a series of confirmatory factor analyses showed that the two-factor structure of the OLBI, with exhaustion and disengagement as separate but correlated factors, is essentially invariant across samples including workers employed in the human services, transport operations, and in the manufacturing industry. This consistency of the factorial structure of the OLBI across different occupations confirms the generalizability of the burnout construct and suggests that human-service burnout represents just a specific, job-dependent realization of burnout (Demerouti & Nachreiner, 1998). Burned-out human service professionals may feel exhausted by the emotionally demanding contacts with their patients or clients and treat them in a depersonalized way. In other occupations, burnout includes the same basic elements (feelings of exhaustion and disengagement), yet their manifestations differ (because there are no recipients of one's service who can be treated in a depersonalized manner).

Second, a parsimonious model—the JD-R model of burnout—identified two key categories of working conditions that seem to play a role in the burnout process. The JD-R model predicts that (high or unfavorable) job demands are primarily and positively related to exhaustion, whereas job resources are primarily and negatively related to disengagement from work. Results of a series of structural equation analyses, both with self-report data and with observer ratings of job characteristics, provide strong and consistent evidence for the validity of this model. An alternative model with two additional paths running from job demands to disengagement and from job resources to exhaustion did not fit better to the data, and these additional paths were not significant. Despite the rather limited power, results of similar analyses using observer ratings corroborated results using self-reports.

The findings with the JD-R model are consistent with several authors' claims about the differential pattern of relationships between *specific* job demands, *specific* job resources, and burnout components as measured with the MBI (e.g., Burke & Greenglass, 1995; Cordes & Dougherty, 1993; Eisenstat & Felner, 1984; Friesen & Sarros, 1989; Lee & Ashforth, 1996, Leiter, 1989). Moreover, fragmented empirical evidence for this differential pattern of relationships has been reported in the literature. For example, regarding job demands, physical workload (Janssen, Bakker, & de Jong, 2001), poor environmental conditions (Friedman, 1991), demanding clients (Leiter & Maslach, 1988, Whitehead, 1987), time pressure, and unfavorable shift-work schedules (Kandolin, 1993) have all been related to feelings of (emotional) exhaustion. Regarding job resources, performance feedback (Åström, Nilsson, Norgerg, Sandman, & Winblad, 1990), rewards (Landsbergis, 1988), job security (Dekker & Schaufeli, 1995), job control (Landsbergis, 1988), participation in decision making (Jackson, Turner, & Brief, 1987), and support from supervisors (Leiter, 1989) have all been related to depersonalization (disengagement). These earlier findings do not only underscore the validity of our findings, they also show that the JD-R model is a parsimonious model that can capture each of these working characteristics simultaneously.

In summary, our findings suggest that the development of burnout symptoms is determined by a specific constellation of working conditions. When job demands are high, we predict that employees experience increased exhaustion (but not disengagement). When job resources are lacking, we predict high levels of disengagement (but not exhaustion). In jobs with both high job demands and at the same time, limited job resources, we predict that employees develop both exhaustion *and* disengagement. This state, where both exhaustion and disengagement are simultaneously present, represents the *burnout syndrome*. According to our conceptualization, burnout represents a dichotomous and not a continuous trait, as in Maslach's concept, where burnout can have low, medium, or high levels (Maslach & Jackson, 1986). Furthermore, exhaustion and disengagement are correlated and not necessarily causally related to each other but to the particular working conditions. Disengagement is, according to our findings, not an outcome of exhaustion (cf. Leiter, 1991) but of a shortage of job resources. Nevertheless, it is possible that exhaustion develops faster than disengagement because individuals seem to be more sensitive to job demands (Hobfoll, 1989). Longitudinal studies are essential to justify this assumption.

The JD-R model of burnout is a parsimonious model, including only four basic components, that is, job demands, job resources, exhaustion, and disengagement. Nevertheless, the model allows

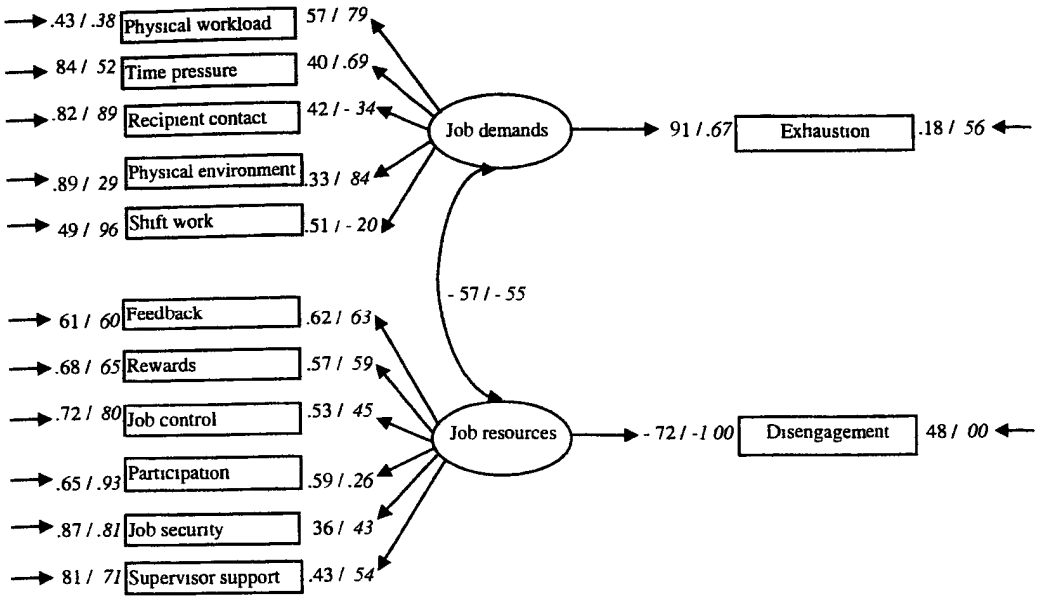

Figure 3. Standardized solution of the job demands–resources model of burnout for the total sample: results of the self-reports and observer ratings (in italics)

various working conditions to be differentially relevant in explaining burnout, depending on the specific occupational group under study. Taken together, the working conditions as included in the JD-R model show a similar pattern of relationships with both burnout dimensions in each sample included; however, specific aspects of the working environment predominated in each occupational field. In other words, the general framework of the JD-R model seems to remain stable across occupational fields, whereas the contribution of specific working conditions in explaining burnout differs slightly from one sample to the other. Quite remarkably, results among production workers are consistent with Karasek's (1979) model regarding the importance of job demands and control as predictors of strain. The fact that a general model holds across various occupations within and outside the human services is another strong indication that burnout is not limited to a particular job setting

Table 6
Fit Indices of the Job Demands–Resources (JD-R) Model of Burnout and the Alternative Model for Three Samples

Model	χ^2	*df* [a]	*p*	GFI	RMR	NFI	CFI	IFI
			Human services					
JD-R	38 53	42	624	96	.03	90	99	99
Alternative[b]	38 23	40	.550	96	.03	.90	.99	99
Null	374.16	78		62	.10			
			Transport					
JD-R	60.90	50	139	91	.03	.81	96	.96
Alternative[b]	60 08	48	102	91	03	81	95	.95
Null	320 83	78		54	.11			
			Industry					
JD-R	53.37	43	.133	94	.03	.88	97	.97
Alternative[b]	46.13	41	268	95	03	89	96	.99
Null	429 36	78		.56	13			

Note Sample sizes are as follows: human services, N = 145; industry, N = 134; transport, N = 95 GFI = goodness-of-fit index; RMR = root-mean-square residual; NFI = normed fit index, CFI = comparative fit index, IFI = incremental fit index

[a] Differences in degrees of freedom between the models for the three samples are due to differences in the number of covariations between the error terms of the indicators of the exogenous variables [b] The alternative model includes the paths from job demands to disengagement and from job resources to exhaustion

Self-Reports Versus Observer Ratings

A distinct feature of the results of our study is the support for the JD-R model for both self-reports and observer ratings. Differences in the strength of the referred relationships between self-reports and observer ratings show that the two units of analysis might not measure exactly the same qualities. The correlations between self-reported and observed work characteristics are quite low, and this is particularly true for the job demands (see also Karasek, 1998). The reason might be again the sensitivity of individuals to the demands placed on them rather than to the resources received (Hobfoll, 1989). Spector (1992) discusses some other factors that have been advanced as causes of self-reported job characteristics, namely social cues from others, individual personality, cognitive processes, mood, attitudes, and feelings about the job. As Sanchez, Zamora, and Viswesvaran (1997) note, "although agreement between sources may create the perception of validity among end-users of job information, between-source disagreement may in fact enhance the understanding of the job" (p. 216). They propose that the combination of sources provides a richer portrait of the job than its parts

Whereas the analyses with the self-reports contained information about individual burnout and individual perceptions of the

working conditions (*individual unit of analysis*), the analyses with the observer ratings contained information about job burnout (mean scores of participants with the same job position) and the observed working conditions that refer to job prototypes (*job unit of analysis*). Although the analyses with the observer ratings were restricted in their power (because of the small sample size), they showed that we could view burnout as a characteristic of the job. That is, specific working conditions of a specific position merge, come into effect, and produce these reactions in its incumbents—independent of individual differences. The individual differences will merely modify the extent of these reactions as well as the perceptions and cognitive operations. Moreover, results clearly demonstrate that burnout is not just a phenomenon to be found in people's minds, depending on their consistent perceptions and interpretations of their work situation. Results show that there is a path from a stimulus condition, defined independently from the persons reporting their perceptions and reactions, to exactly these reactions. This finding has substantial implications for interventions. To reduce exhaustion and disengagement, one should in the first place provide for adequate job demands and job resources in the working environment by adequate job design and not try to change people's perceptions and interpretations of their working conditions.

Limitations

Because of the cross-sectional design of the current study, the postulated relationships between working conditions and burnout dimensions cannot be interpreted causally. However, the correspondence between the results obtained with self-reports and with the observer ratings suggests that the findings do not result from cognitive consistency in the perceptions of the employees or from common-methods bias (cf. Doty & Glick, 1998). In other words, the "triviality trap" has successfully been avoided. Nevertheless, longitudinal studies and quasiexperimental research designs are needed to further validate the hypothesized causal relationships in the JD-R model. Another limitation of the present research is that our samples have not been randomly selected from the entire populations of the universe of jobs. Basically, this calls into question the generalizability of the present findings. However, our findings confirmed results of earlier studies and hypotheses that are firmly rooted in theory. In addition, an advantage of our recruitment procedure is the heterogeneity of the samples, which is seldom the case in burnout studies (Jackson et al., 1987). The participants in our study came from different occupational fields and were employed in different job positions. Finally, a real weakness of the study is that the instruments for assessing the self-reported and observed working conditions included only a limited number of items with consequences for their internal consistencies. Future studies should include more reliable scales for the assessment of both perceived and actual working conditions.

Implications for Research and Practice

Despite the limitations of this study, the present findings may have important implications for future research and practice. First of all, the fact that burnout can be found within as well as outside human-service professions may stimulate future burnout research in a wide range of occupations (see Schutte et al., 2000). It would be interesting, for example, to focus on the relative prevalence of burnout in various occupations and under several job conditions. Differences between occupational groups regarding absolute burnout scores may help to identify occupations that are most at risk for burnout. Second, the application of the JD-R model in research among different occupational groups may further increase our understanding of the phenomenon and process of burnout, as well as other long-term consequences of the job for the individual. Note that the JD-R model is a parsimonious model that is capable of integrating a wide range of potential job demands and job resources. Accordingly, it can be used to study different profiles of job demands and job resources that might be typical for burnout in specific occupations. The model clearly expands earlier models of work-related stress and burnout, such as the job demands-control model (Karasek, 1979) and the demand–control–support model (Johnson & Hall, 1988). It is possible that job demands are not only linked to exhaustion but consequently to psychosomatic complaints and that job resources lead to disengagement and furthermore to turnover. In addition, it is possible that both job demands and resources (and consequently both burnout dimensions) contribute to diminished job performance. Further research is necessary to clarify such prolonged causal links.

The JD-R model may also be applied for workplace interventions aimed at preventing or reducing burnout. As shown, results suggest that to avoid employees' exhaustion, specific job demands have to be reduced or redesigned. In addition, increasing job resources may enhance employees' engagement. The *specific* job demands and resources to be addressed appear to differ for the three occupational groups included in this study. This implies that burnout interventions will be most successful if they are tailor made to address the most important job demands and job resources in specific working environments. Each of these occupation-specific interventions should contribute to the reduction of job demands and increase of job resources that can, in turn, lead to the reduction of exhaustion and disengagement among employees and, furthermore, may lead to more happiness at work.

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Received May 26, 1999
Revision received May 22, 2000
Accepted June 1, 2000 ■