AUTHOR'S QUERY SHEET

Author(s): A. B. Bakker et al. GASC 296029
Article title:
Article no:

Dear Author

The following queries have arisen during the editing of your manuscript and are identified on the proofs. Unless advised otherwise, please submit all corrections using the CATS online correction form.

AQ1 Please note that the values have been changed contextually as per Figure 2.

AQ2 References [Bhagat et al. (1995), Cropanzano et al. (2003), Harman (1967), Lazaro et al. (1985), Nowack & Hanson (1983), Parker & Kulik (1995), Randall & Scott (1988), Ursprung (1986), Zedeck et al. (1988), Zwerts et al. (1995)] are not cited in the text. Please cite them or delete.

Anxiety, Stress, & Coping,
July 2008; 21(3): 1–16

Routledge
Taylor & Francis Group

How job demands, resources, and burnout predict objective performance: A constructive replication

ARNOLD B. BAKKER[1], HETTY VAN EMMERIK[2], & PIM VAN RIET[2]

[1]*Department of Work & Organizational Psychology, Erasmus University Rotterdam, Rotterdam, The Netherlands &* [2]*Department of Social & Organizational Psychology, University Utrecht, Utrecht, The Netherlands*

Abstract

The present study uses the Job Demands-Resources model (Bakker & Demerouti, 2007) to examine how job characteristics and burnout (exhaustion and cynicism) contribute to explaining variance in objective team performance. A central assumption in the model is that working characteristics evoke two psychologically different processes. In the first process, job demands lead to constant psychological overtaxing and in the long run to exhaustion. In the second process, a lack of job resources precludes actual goal accomplishment, leading to cynicism. In the present study these two processes were used to predict objective team performance. A total of 176 employees from a temporary employment agency completed questionnaires on job characteristics and burnout. These self-reports were linked to information from the company's management information system about teams' ($N = 71$) objective sales performance (actual sales divided by the stated objectives) during the 3 months after the questionnaire data collection period. The results of structural equation modeling analyses did not support the hypothesis that exhaustion mediates the relationship between job demands and performance, but confirmed that cynicism mediates the relationship between job resources and performance suggesting that work conditions influence performance particularly through the attitudinal component of burnout.

Keywords: *Burnout, Job Demands-Resources model, objective performance*

Generally, it is assumed that burnout negatively affects job performance, although the evidence is still limited (Demerouti & Bakker, 2006). Moreover, research has usually relied on subjective assessments of job performance (Taris, 2006) and studies on the impact of burnout on objective performance are virtually lacking (Halbesleben & Buckley, 2004). Using the Job Demands-Resource (JD-R) model as a guiding framework, the goal of the present study was to examine how job demands and resources are related to teams' objective financial performance focusing on the mediating role of burnout (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Specifically, the purpose of the present study was a constructive replication of Bakker, Demerouti, and Verbeke (2004). Following Lykken (1968), a constructive replication extends the generalizability of the research after which it is modeled by avoiding exact duplication.

Correspondence: Arnold B. Bakker, Institute of Psychology, Erasmus University Rotterdam, Woudestein, T12-47, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands. Tel: +31 10 408 8853. Fax: +31 10 408 9009. E-mail: bakker@fsw.eur.nl

ISSN 1061-5806 print/ISSN 1477-2205 online
DOI: 10.1080/10615800801958637

Consequently, we used different demands and resources as predictors, another measure of burnout, and objective financial performance at the team level as the dependent variable (instead of colleague ratings of performance).

Burnout

Burnout was originally conceived as a work-related syndrome that most often occurs among individuals who work with other people (Maslach & Jackson, 1986). However, research of the past decade has shown that the two core burnout dimensions – emotional exhaustion and cynicism – can be observed in virtually any occupational group (Bakker, Demerouti, & Schaufeli, 2002; Maslach, Schaufeli, & Leiter, 2001). Emotional exhaustion refers to a general feeling of extreme chronic fatigue, caused by continuous exposure to demanding working conditions. Cynicism is defined as a callous, distanced and cynical attitude toward the work itself or the people with whom one works.

Of these two burnout dimensions, emotional exhaustion appears to be the central variable in the burnout process (Baba, Jamal, & Tourigny, 1998; Shirom, 2005). A number of studies have indeed shown that exhaustion is more strongly related to important outcome variables (such as personnel turnover and absenteeism) than the other burnout dimensions (Lee & Ashforth, 1993, 1996; Leung & Lee, 2006; Wright & Bonett, 1997). In addition, exhaustion is always part of the different definitions of burnout (Shirom, 2005). Leiter's (1993) process model of burnout proposes that cynicism should be seen as a consequence of emotional exhaustion. Accordingly, feelings of exhaustion arise from stressful working conditions, whereby employees are repeatedly confronted with high job demands (such as work pressure or high emotional demands) and as a consequence, they can develop a cynical attitude as a coping strategy to distance themselves emotionally and mentally from work (e.g., Bakker, Schaufeli, Sixma, Bosveld, & Dierendonck, 2000; Taris, LeBlanc, Schaufeli, & Schreurs, 2005).

Burnout and Performance

Job performance refers to employees' behaviors that are supposed to contribute to the effectiveness of the organization and to overall organizational performance (Campbell, 1990). Singh, Goolsby, and Rhoads (1994) offer three possible explanations for the influence of burnout on performance. First, burnout is characterized by a reduction of the available energy and the amount of effort that is invested to perform well. Another reason is that employees with burnout get trapped in a negative, vicious cycle, in which they are not inclined to search for support or are not motivated to change their situation. The consequence is that performance declines (Bakker et al., 2004). A final explanation for the impairment of performance is that burnout undermines employees' self-confidence in their ability to solve work-related problems.

However, although a negative relationship between burnout and performance seems apparent, empirical evidence for the influence of burnout on job performance is scarce (Demerouti & Bakker, 2006). On the basis of six studies (total $N = 2000$), Schaufeli and Enzmann (1998) found that burnout correlated only weakly with self-reported job performance. On average, emotional exhaustion and cynicism explained 5 and 4%, respectively, of the variance in job performance. Taris (2006) reviewed 16 studies on the relationship between burnout and "objective" performance (mainly supervisor reports), and found a meta-analytical correlation ($r = -.22$) between exhaustion and in-role

performance. Taris also found that the evidence for the relationship between cynicism (depersonalization) and performance was inconclusive.

In the current study, we wanted to replicate the study of Bakker et al. (2004) among human service professionals. In addition to employee ratings of their own job demands, resources, and burnout (as measured with the Oldenburg Burnout Inventory), Bakker et al. collected colleague ratings of in-role and extra-role performance. The results showed that exhaustion was the most important predictor of in-role performance, whereas cynicism (called disengagement in the study) was the most important predictor of extra-role performance. Both dimensions of burnout explained 8% of the variance in performance.

The Job Demands-Resources (JD-R) Model

In the present study, we used the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti et al., 2001) to examine how job characteristics and burnout contribute to explaining variance in objective team performance. A central assumption in the JD-R model is that working characteristics may evoke two psychologically different processes. In the first process, demanding aspects of work (i.e., work overload and complaining customers) lead to constant psychological overtaxing and in the long run to exhaustion (e.g., Lee & Ashforth, 1996; Wright & Cropanzano, 1998).

According to Hockey's (1993) control model of demand management, employees will use a performance protection strategy when confronted with high job demands. In order to maintain the desired performance level, they will mobilize extra energy to compensate fatigue through mental effort. This implies that when people become exhausted under the influence of environmental demands, they will not be able to perform well because their energy resources are diminished. Indeed, Veldhuizen, Gaillard, and De Vries (2003), using office tasks in order to simulate a working day, found that exhausted participants had problems investing sufficient energy to their tasks. Moreover, exhausted participants' performance results decreased as they reacted more slowly and produced a smaller number of correct responses. Further, exhausted participants seemed unable to perform particularly well in the evening, although they tried to invest more effort than their non-exhausted counterparts. This implies that the impact of job demands on performance could be mediated by feelings of (enhanced) exhaustion (cf. Hockey, 1993). Therefore, we formulated the following hypothesis (see also Figure 1).

Hypothesis 1: Emotional exhaustion fully mediates the relationship between job demands and objective 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, & Schaufeli, 2003). When organizations do not provide their employees with sufficient job resources, withdrawal and decreased commitment will be the end result (Bakker, Demerouti, & Schaufeli, 2003; Demerouti et al., 2001). These outcomes can be interpreted as self-protecting mechanisms that prevent the development of employee frustrations caused by not achieving work-related goals (cf. Hackman & Oldham, 1980). Indeed, consistent with this line of reasoning, Hobfoll's (1989) conservation of resources theory argues that people strive to obtain and maintain (job) resources, and that situations are experienced as stressful when loss or threat of loss occurs, or when the acquiring of job resources fails. To reduce their level of stress, employees will try to limit losses. One way to achieve this is to develop a detached attitude to the job (Wright & Bonett, 1997). We propose that this detached attitude can diminish job performance (cf. Maslach, 1993). The

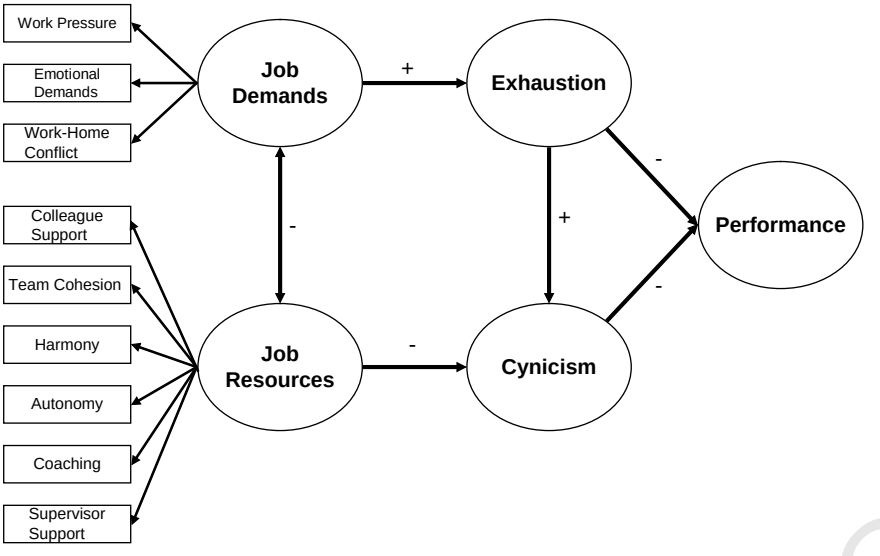

Figure 1. The Job Demands-Resources model.

prediction is that cynicism is the most important consequence of lacking job resources (cf. Bakker & Demerouti, 2007; Demerouti et al., 2001), which, in turn, has a negative association with job performance (see Figure 1).

Hypothesis 2: Cynicism fully mediates the relationship between job resources and objective (financial) performance.

Context of the Present Study: Performance as an Outcome

It was not before the 1990s that scholars formulated precise definitions of performance (Campbell, 1990; Roe, 1999). When trying to define performance, researchers either referred to the process of performance, or to the outcome of performance. According to the former perspective, performance is the *process* by which people try to achieve a given work goal (Roe, 1999). This definition focuses on the actions (or behaviors) that people undertake to achieve their performance or what individuals do in their work situation, like reading scientific literature, writing research proposals, and conducting studies in case of researchers (Demerouti & Bakker, 2006). The second definition views performance as the congruence between the work goal and the *outcome* of the process by which people try to accomplish that work goal (Roe, 1999). For scientists, publication of a scientific article is an example of an outcome of individual behaviors. Conceptually, this differentiation is helpful to explicate what we talk about when studying performance. Practically, and in many cases even psychometrically, it is difficult to separate behaviors from their outcome because the behaviors are mainly enacted in order to achieve the outcome.

In the present study, performance was operationalized through an objective assessment of team effectiveness, which is clearly an outcome-related indicator of performance. This kind of performance is also known in the literature as in-role performance, defined as those officially required outcomes and behaviors that directly serve the goals of the organization (Motowildo & Van Scotter, 1994). Among other things, in-role performance includes meeting company objectives (Behrman & Perreault, 1982).

We used the JD-R model to examine how burnout affected the performance of groups of employees who worked in autonomous teams of a temporary employment agency. Every team included at least one desk manager, one sales executive, and one team manager. The goal of each team was to realize the yearly sales objectives by placement of temporary employees. We used the extent to which the sales objectives (of the teams) were met as the operationalization of job performance. This operationalization is an objective measurement of team effectiveness. Previous studies on performance most frequently used individual level outcomes (e.g., Bakker et al., 2004) or aggregated individual level outcomes to the group or unit level (see Taris, 2006).

There is scarce empirical evidence for the relationship between burnout and *team* performance. The PsychInfo database revealed only one empirical study (Keijsers, Schaufeli, Le Blanc, Zwerts, & Reis Miranda, 1995). This study reported a negative correlation between intensive care nurses' feelings of burnout and subjective unit performance. In contrast, burnout was positively related to objective unit performance. Regarding the temporary employment agencies of the present study, a negative association between burnout and performance is to be expected. Team members are jointly responsible for the realization of their yearly sales objectives (work goal interdependence), and are strongly dependent on each others' efforts to meet these objectives (task interdependence). A number of theories presuppose that interdependence is one of the most important predictors of team effectiveness (e.g., Gladstein, 1984; O'Leary Kelly, Martocchio, & Frink, 1994; Shea & Guzzo, 1987). Team members who perform insufficiently would have a negative impact on the performance of their team. For example, within an employment agency, a desk manager has to perform many ad hoc tasks, and this demands flexibility and mental energy. If the desk manager suffers from burnout, he or she will be less able to comply with these task demands. The placement of the temporary employees will most probably be affected by these processes and will be less efficient, which, in turn, negatively affects the realization of the company's objectives.

Method

Participants and Procedure

A survey study was conducted in an organization of temporary employment agencies. All 508 employees were approached for the present study. The management informed the employees with a letter that the study would consist of a qualitative and a quantitative part. For the qualitative part, 15 explorative interviews were conducted. Based on the results, specific job demands and job resources were chosen to be included in the questionnaire. For the quantitative part, the questionnaire and an accompanying letter was sent to employees' home addresses. It was emphasized that the information would be treated confidentially and that the results would be reported anonymously to the management. Two reminders from the human resource management department were sent to increase the response rate. In total, 290 employees responded (57%). For the present study, we used the data of those 176 respondents who were still employed within the company during the follow-up study of financial performance (the 3 months after the questionnaire data collection). It should be noted that a high personnel turnover is not uncommon in this sector.

We performed a multivariate analysis of variance (MANOVA) to examine the extent to which there were differences between our final sample ($N = 176$) and the dropouts ($N = 114$) on all model variables. The MANOVA produced a multivariate significant effect, $F(11,\ 278) = 3.13,\ p < .001$. Univariate analyses showed that the two groups differed

significantly regarding work pressure, $F(1, 288) = 10.27$, $p < .01$; harmony $F(1, 288) = 17.62$, $p < .001$; exhaustion, $F(1, 288) = 7.63$, $p < .01$; and cynicism, $F(1, 288) = 10.32$, $p < .001$. The research sample scored less favorable than the dropouts on each of these variables: work pressure $M = 3.16$ vs. $M = 2.88$; harmony $M = 4.00$ vs. $M = 4.28$; exhaustion $M = 1.69$ vs. $M = 1.39$; and cynicism $M = 1.28$ vs. $M = .95$. There were no differences between both groups regarding the background variables, or the other job demands and resources. Taken together, these results suggest that our research group experienced more strain than the dropouts.

The research sample included 97 desk managers (55%), 29 sales executives (17%) and 50 branch managers (28%) working in one of 71 teams. The mean number of respondents per team was 2.5 ($SD = 1.2$, range = 1–6), whereas in the whole company this was five employees. Sixteen (25%) of these 71 teams represented all three job categories. The vast majority of the sample was female (85%). Age ranged between 21 and 50 years, with a mean of 27 years ($SD = 4.5$). The educational level was mainly upper secondary education (53%) and higher vocational training (43%). The average organizational tenure was 2.7 years ($SD = 2.6$), and mean number of working hours was 38 hours per week ($SD = 4.5$). Almost all employees (94%) had a permanent employment contract. The correlational analyses showed no significant relationships between the demographic characteristics and the model variables. Therefore, demographic characteristics were excluded from all further analyses.

Measurement Instruments

Job Demands. Three demands were included in the questionnaire: work pressure, emotional demands, and work–home conflict. All items were answered on a scale from 1 = never to 5 = always. Work pressure was assessed with the five-item scale developed by Bakker et al. (2004). An example is: "How often does it occur that you have to work extra hard to finish your work?" Emotional demands were measured with three items of the scale developed by Van Veldhoven and Meijman (1994). One item was deleted, because the reliability analysis indicated that it was unsound. The remaining two items are: "Does your work put you in emotional situations?", and "Is your job emotionally demanding?" Finally, work–home conflict was measured with three items of the SWING (Geurts et al., 2005; see also Demerouti, Bakker, & Bulters, 2004). An example is: "How often does it happen that you find it difficult to fulfill your domestic obligations because you are constantly thinking about your work?"

Job Resources. Six job resources were included in the questionnaire: social support from colleagues, team cohesion, harmony, autonomy, supervisory coaching, and supervisor support. All items were answered on a scale from 1 = never to 5 = always, unless otherwise indicated. *Social support* was measured with the three-item scale developed by Bakker et al. (2003). An example is: "If necessary, can you ask your colleagues in your team for help?" *Team cohesion* was also assessed with three items, based on the "Substitutes for Leadership Scales" (Podsakoff & MacKenzie, 1994). Two examples are: "Together, my colleagues and I constitute a cohesive team", and "In my team we are well-tuned to work together" (1 = completely disagree, 5 = completely agree). *Harmony* was measured with a four-item scale, based on Jehn (1994, 1995). An example is: "How often do colleagues within your team get angry with each other?" (reverse coded). *Autonomy* was measured with a short scale developed by Bakker et al. (2004) that comprises three items referring to decision authority (i.e., freedom of action in accomplishing the formal work task). An example item

is: "Can you decide yourself how you execute your work?" *Supervisory Coaching* was assessed with a four-item scale derived from the "Leadership Practices Inventory" (Posner & Kouzes, 1988, 1994). An example is: "Does your manager clearly envision future opportunities?" (1 = not at all, 5 = to a high extent). Finally, *supervisor support* (the team manager) was measured with five items from the scale of LeBlanc (1994), for example, "My supervisor uses his/her influence to help me to perform well".

Burnout was measured with the scales from the Dutch version (Schaufeli & Van Dierendonck, 2000) of the Maslach Burnout Inventory-General Survey (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996). We used the scales to assess the two core dimensions of burnout: emotional exhaustion and cynicism. The exhaustion scale consists of five items, including "I feel burned out from my work" and "I feel tired when I get up in the morning and have to face another day on the job" (0 = never, 6 = always). Cynicism was measured with four of the five items from the original scale. An example item is: "I have become more cynical about whether my work contributes anything". Item 4 ("I just want to do my job and not be bothered") was omitted, as suggested by Schaufeli and Van Dierendonck (2000) and Schutte, Toppinnen, Kalimo, and Schaufeli (2000). They have shown that this item does not load on the intended factor, and thus creates problems with factorial validity.

Performance was operationalized through an objective assessment of team effectiveness using a standardized measurement of sales. Information about each team's sales performance during the 3 months after the questionnaire data collection period was drawn from the management information system. As the size of the teams was not constant, we divided the actual sales by the stated objectives (the larger the team, the larger the stated objective). This resulted in a standardized objective measure of effectiveness that signified to what extent the stated sales objectives had been realized.

Analyses

The model in Figure 1 was tested in two steps with structural equation modeling (SEM) analyses using AMOS 6.0 (Arbuckle, 2005). Maximum likelihood estimation methods and the covariance matrix of the above-mentioned scales were used. To test the fit of alternative models to the data, the traditional chi-square, the goodness-of-fit index (*GFI*) and the root mean square error of approximation (*RMSEA*) were assessed. As a rule of thumb, a $GFI > .90$ and $RMSEA < .08$ indicate a reasonable fit of the model to the data (Browne & Cudeck, 1989). As recommended by Marsh, Balla, and Hau (1996), the non-normed fit index (*NNFI*), the incremental fit index (*IFI*), and the comparative fit index (*CFI*) were also assessed. These values should meet the criterion of .90 (Hoyle, 1995).

In the first step, we tested the measurement model. The second step involved the test of our theoretical model with structural paths ($N = 176$). For this analysis, a team score on objective financial performance (a team variable) was allocated to each individual team member. The latent exogenous job demands and resources factors were operationalized by three and six observed variables, respectively (see above). Further, the model consisted of two endogenous latent variables that were included as mediators: emotional exhaustion and cynicism. Both emotional exhaustion and cynicism were operationalized by one indicator (the respective scale of the MBI-GS) to ensure a parsimonious model. We controlled for measurement errors by equalling the error variance of emotional exhaustion to the product of its variance and the quantity 1 minus the internal consistency (Jöreskog & Sörbom, 1993). The same procedure was followed for cynicism. The endogenous variable "performance" was included in the model as an observed variable.

Results

Descriptive Statistics

Table I presents the means, standard deviations, reliabilities, and correlations between the model variables. All constructs were measured reliably. It can be seen that the specific job demands correlated most strongly with emotional exhaustion and that the specific resources correlated most strongly with cynicism. In addition, performance correlated primarily with resources (positive) and cynicism (negative).

Measurement Model

Our initial measurement model showed a poor fit to the data, χ^2 (47) = 193.14, *GFI* = .84, *RMSEA* = .13, *NNFI* = .68, *CFI* = .77, and *IFI* = .78. The modification indices revealed high covariations between the errors of several job resources indicators. Specifically, the AMOS output suggested that the fit of the measurement model to the data could be improved considerably if two separate job resources factors would be distinguished. One job resource factor included the three job resources referring to the interpersonal relationships with colleagues in the team, namely colleague social support, team cohesion, and harmony. This factor will be referred to as "colleague resources". The second job resource factor included the three resources referring to the relationship with the supervisor, namely supervisor support, supervisory coaching, and autonomy. This factor will be referred to as "supervisor resources".

The modified measurement model (see Figure 2) showed an acceptable fit to the data, χ^2 (42) = 90.21, *GFI* = .92, *RMSEA* = .08, *NNFI* = .88, *CFI* = .92, and *IFI* = .93. All indicators loaded well on the respective factors. For the job demands, the factor loadings ranged from .41 to .73. The factor loadings of the colleague resources social support, harmony, and team cohesion were .65, .75, and .80, respectively; the factor loadings of the supervisor resources autonomy, supervisory coaching, and supervisor support were .48, .90, and .84, respectively.

AQ1 AQ1 AQ1

Test of the Job Demands-Resources (JD-R) Model: Level 1 Analyses

In the next step, we tested the JD-R model including the hypothesized relationships and the correlations between the latent factors job demands, colleague resources, and supervisor resources. Using the chi-square difference test, this model was compared with simpler nested models that specify alternative relationships. As the dependent variable in the present study (objective financial performance) was measured at the aggregate, team level, we allocated the team score on objective financial performance to each of the employees working in that team. The results of the SEM analyses showed that the hypothesized model fits reasonably well to the data, χ^2 (48) = 96.89, *GFI* = .92, *RMSEA* = .08, *NNFI* = .90, *CFI* = .93, and *IFI* = .93. In line with expectations, the results revealed a positive relationship between emotional exhaustion and cynicism ($\beta = .39$, $p < .01$).

In order to test the mediation hypotheses formulated in Hypotheses 1 and 2, we followed Baron and Kenny's (1986) approach, according to which there are four steps in establishing a significant mediation effect. First, there must be a significant relationship between the predictor and the outcome. Second, the predictor must be significantly related to the mediator. Third, the mediator should be significantly related to the outcome variable. Finally, there is a significant mediation effect when the relationship between the predictor and the outcome becomes non-significant after the inclusion of the mediator. Before testing

Table I. Means, standard deviations, reliability coefficients, and correlations between the variables.

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. Work pressure	3.16	.71	(.81)										
2. Emotional demands	1.83	.66	.24**	(.71)									
3. Work–home conflict	1.92	.67	.30**	.29**	(.70)								
4. Social support colleagues	3.99	.74	.01	−.07	−.28**	(.81)							
5. Harmony	4.00	.59	−.12	−.06	−.20**	.47**	(.88)						
6. Team cohesion	3.67	.72	−.05	−.08	−.18**	.52**	.60**	(.80)					
7. Autonomy	3.73	.74	−.14	−.17*	−.32**	.31**	.32**	.32**	(.79)				
8. Supervisory coaching	3.58	.77	.04	−.11	−.26**	.31**	.35**	.38**	.38**	(.84)			
9. Supervisor support	3.42	.89	−.09	−.09	−.27**	.36**	.24**	.24**	.42**	.76**	(.90)		
10. Exhaustion	1.69	.94	.40**	.35**	.61**	−.20*	−.27**	−.18**	−.24**	−.20**	−.17	(.90)	
11. Cynicism	1.28	.87	.15*	.08	.37**	−.27**	−.37**	−.38**	−.44**	−.38**	−.31**	.46**	(.83)
12. Objective (team) performance (%)	22.00	4.00	−.03	.04	−.11	.01	.27**	.29**	.04	.20*	.05	−.12	−.26**

Note. $N = 176$ employees divided over 71 teams. Reliabilities (Cronbach's alphas) are shown in the diagonal.
*$p < .05$, **$p < .01$.

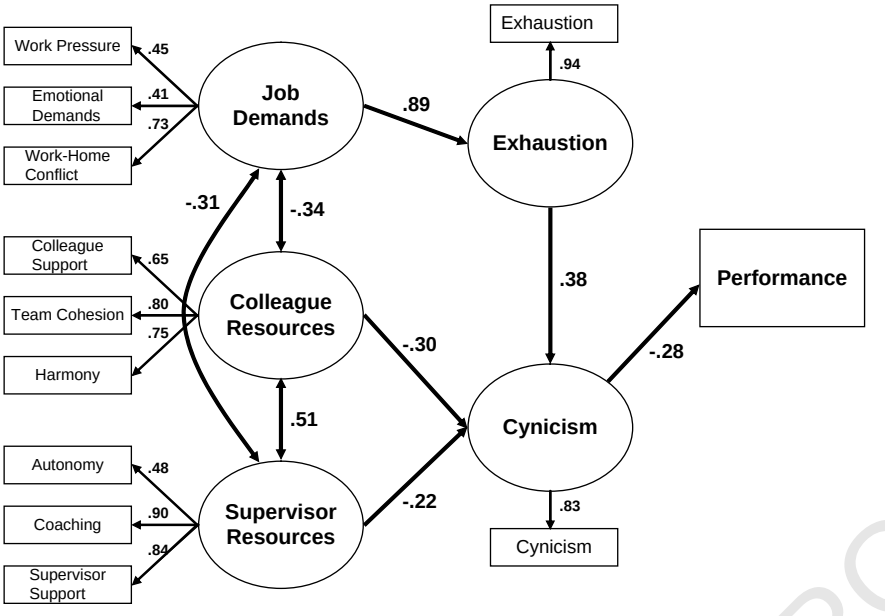

Figure 2. Maximum likelihood estimates of the revised JD-R model, $N = 176$ employees and $N = 71$ teams.
Note. All parameters are significant at the $p < .01$ level, except the coefficient of the path from supervisor resources to cynicism, which is significant at the $p < .05$ level.

whether exhaustion was a mediator of the relationship between job demands and performance (Hypothesis 1), we first checked for the prerequisite conditions. The results of the hypothesized model showed that the coefficient of the path between emotional exhaustion and objective performance was *not* significant, $\beta = .04$, $t < 1$, *ns* indicating that Hypothesis 1 was not supported.

In the next step, we checked the prerequisites before testing whether cynicism mediates the relationship between job resources and performance (Hypothesis 2). Preliminary results showed that colleague resources and supervisor resources were both related to the mediator cynicism, $\beta = -.30$ ($p < .01$) and $\beta = -.22$ ($p < .05$), respectively. In addition, cynicism was significantly related to performance, $\beta = -.30$ ($p < .01$). However, while colleague resources was related to performance, $\beta = .21$, $p < .05$, supervisor resources was not, $\beta = -.03$, *ns*. These results allowed proceeding with the test of Hypothesis 2, but only for colleague resources.

We compared the proposed mediation model with a model including an additional direct path from colleague resources to performance in order to see which model fitted better to the data (Frazier, Tix, & Barron, 2004). The results showed that the alternative partial mediation model did not fit better to the data than the proposed model, Delta χ^2 (1) $= 3.04$, *ns*, and that the direct path of colleague resources to performance became non-significant ($t = 1.80$, *ns*). This indicates that cynicism mediated the relationship between colleague resources and performance. The results of the Sobel test confirmed that colleague resources had an indirect effect on performance through cynicism ($z = 2.28$, $p < .05$). Thus, Hypothesis 2 was supported as far as resources from colleagues are concerned. These findings suggest that employees who received support from their colleagues and worked in close harmony were less cynical about their job, and performed better than employees who

had non-harmonious mutual relationships and displayed a detached attitude toward their work.

Based on these results, the proposed model was modified regarding one pathway: the path from emotional exhaustion to performance was deleted. The fit of this model to the data was acceptable, χ^2 (49) = 97.03, *GFI* = .92, *RMSEA* = .08, *NNFI* = .90, *CFI* = .93, and *IFI* = .93. The results are summarized in Figure 2. The JD–R model explains 79% of the variance in exhaustion, 47% of the variance in cynicism, and 8% of the variance in objective financial performance.

Level 2 Analyses

The previously described SEM analyses were performed at the individual level ($N = 176$) by allocating team scores on the (aggregate level) performance variable to each of the employees working in the teams. This procedure may have led to an artificial increase in the statistical power. In addition, the estimation of the effect of burnout on objective financial performance may have been affected. We therefore decided to conduct additional level 2 analyses.

As the dependent variable was at the aggregate level, we aggregated all the independent variables and we assessed the inter-rater agreement kappa. Kappa indicates the percentage agreement, the closer to 100% agreement, the higher the reliability. Inter-rater reliability kappa was calculated using multi-rater kappa (an unweighted form of kappa) using the MKAPPASC.SPS macro in SPSS. Although there are different methodologies for the assessment of observer agreement developed, in the present study we used Kappa because of the small number of employees per team (the mean number of respondents per team was 2.5 with $SD = 1.2$ and range = 1–6). Kappa can handle cases where there are only two raters and when there are more than two raters or when there are more than three categories to be rated. According to Altman (1991), interpretation of Kappa is: poor agreement $< .20$, fair agreement = .20 to .40, moderate agreement = .40 to .60, good agreement = .60 to .80, and very good agreement = .80 to 1.00. Kappas for the scales included in the present study generally indicated fair agreement: social support from colleagues = .39, team cohesion = .26, harmony = .32, autonomy = .35, supervisory coaching = .29, supervisor support = .38, work pressure = .15, emotional demands = .39, work–home conflict = .26, exhaustion = .28, and cynicism = .34.

Additional analyses for both burnout components – exhaustion and cynicism – were performed to examine the correlation with objective financial performance at the team level ($N = 71$). The results showed that both exhaustion ($r = -.27$, $p = .02$) and cynicism ($r = -.47$, $p < .001$) were significantly and negatively associated with objective financial performance. Note that the pattern of the correlations at the team level was consistent with the pattern at the individual level.

Discussion

The present study is one of the first studies that examined the relationship between working conditions, burnout, and objective (financial) performance. On the basis of the JD-R model (Bakker & Demerouti, 2007; Demerouti et al., 2001), two central hypotheses were formulated: exhaustion mediates the relationship between job demands and performance, and cynicism mediates the relationship between job resources and performance. SEM analyses found only support for the mediating role of cynicism. Colleague resources (e.g., team cohesion and harmonic relationships with colleagues) were most clearly related

to objective team performance, because these resources are motivating and prevent employees from developing a cynical, detached attitude. Therefore, the conclusion is that motivation, and not strain, plays a prominent role when it comes to objective performance. This is a relevant finding, since exhaustion (and not cynicism) is considered to be the core symptom of burnout (Baba et al., 1988; Shirom, 2005), and exhaustion is known to have the strongest relationship with self-reported job performance (Schaufeli & Enzmann, 1998).

How can we explain that previous studies found most support for a relationship between emotional exhaustion (not cynicism) and in-role performance, including the study we replicated (Bakker et al., 2004)? First of all, it is conceivable that we had a restriction in range regarding the exhaustion variable. For one thing, the levels of exhaustion among the young participants were relatively low – even though they scored somewhat higher than the dropouts. This may have limited the statistical possibility to find a relationship between exhaustion and performance in the present study.

Second, given these low levels of exhaustion, it is unlikely that our participants were unable to perform well because their energy resources were diminished, as in the study of Veldhuizen et al. (2003). To this extent, it would be interesting to replicate the present study among a heterogeneous group of employees, including a wide range of exhaustion levels. Indeed, it is conceivable that the relationship between emotional exhaustion and job performance is better explained by a curvilinear than a linear relationship (Gardner & Cummings, 1988). A curvilinear relationship assumes the existence of an optimal activation level of effort to perform well, with impaired performance under conditions of very low and very high levels of exhaustion, and increased performance under conditions of average levels of exhaustion. However, additional analyses of the present data do not support this explanation.

Third, it is conceivable that previous studies overestimated the relationship between exhaustion and performance because of common-method variance problems. Indeed, most previous studies used a questionnaire design and did not include objective indicators of performance. Finally, it should be noted that we did find a correlation between exhaustion and performance at the team level. However, this correlation disappeared when the data were analyzed at the employee level, and when exhaustion had to compete with cynicism in the prediction of performance.

In Lykken's (1968) terminology, the present study is a constructive replication of Bakker et al. (2004) because we used several other job demands and resources, a different measure of burnout, and objective financial performance *at the team level* as the dependent variable (instead of colleague ratings of performance). However, our theoretical framework and some of the hypotheses were the same. The findings of the present study are generally in line with Bakker et al. (2004) supporting the two independent pathways leading to performance as proposed by the JD-R model (Bakker & Demerouti, 2007). Thus, our findings suggest that job resources may start a motivational process because job resources had a negative impact on cynicism, and indirectly contributed to objective performance. In contrast, job demands seem to evoke a health impairment process, in which increased job demands coincide with increased levels of exhaustion.

Our findings are also consistent with Campbell's (1990) theory, which gives a central role to motivation as a determinant of job performance. Eight percent of the variance in objective financial performance was explained by cynicism. This 8% is considerable if we consider the following arguments. First, in Campbell's theory – besides motivation – two other determinants are distinguished: declarative and procedural knowledge. Sternberg

(1994) proposes a number of additional determinants, including learning styles and personality differences. Muchinsky (1993) has argued that situational factors may act as determinants of performance as well. In short, in addition to motivation, job performance may be explained by several other factors. Second, cynicism is an indirect indicator of motivation as defined by Campbell. He assumes that motivation is the combined effect of three choices: (a) the choice to put in effort; (b) the choice for the amount of effort; and (c) the choice to continue effort. In contrast, cynicism refers to a negative job attitude, which will generally coincide with the choice to put in less effort.

In the present study, the indicator of job performance was an indirect indicator as well because team effectiveness referred to the job performance of all team members. If we had been able to use more direct measures for motivation and job performance, the association between cynicism and performance might have been stronger. As a matter of fact, additional analyses showed a considerably stronger association between cynicism and performance at the team level as compared with the individual level. Nevertheless, if we compare the amount of variance (8%) that cynicism explained in the objective (financial) performance with previous studies, the conclusion is that the present study explained more variance than previous studies (see Schaufeli & Enzmann, 1998; Taris, 2006).

Limitations of the Present Study

In the present study, we related employees' individual burnout scores to team effectivity. As the teams in our sample represented only 50% of all employees, a considerable amount of information could not be included in the analysis. It is therefore unclear whether the finding that cynicism explained 8% of the variance in performance is an under- or over-estimation. Furthermore, some teams were represented by one person only. As performance is the result of the combined effort of all team members, we believe that using the information regarding working conditions and burnout of only one member is not necessarily a problem, but represents a conservative test of our hypotheses. Nevertheless, it is evident that more employees per team would have been preferred.

Another limitation pertains to the design of the present study. The present study is cross-sectional as far as the questionnaire data are concerned; all these data were collected at one point in time. A consequence of this is that we cannot be confident about the causal direction of the pathways included in the JD-R model. For example, it is conceivable that exhaustion is not only a consequence, but also a cause of job demands (Demerouti et al., 2004). Future longitudinal studies with a cross-lagged panel design are therefore desirable. Note, however, that longitudinal studies have their own challenges, including attrition. Our dropout analysis showed that the attrition in the present study was not random. The results revealed that our participants scored higher than the dropouts on work pressure, lower on harmony, and higher on exhaustion and cynicism. It is unclear how these differences have affected our findings, but it is conceivable that the research sample showed a restriction of range in the model variables, which may have made it more difficult to find effects. Finally, the vast majority of the participants were female. It is therefore important to replicate the current findings in more heterogeneous samples, including men and women, younger and older employees, and different occupations.

Practical Implications

The results of the present study are valuable for human resource management policies within this organization. Motivation (cynicism) appeared to be an important explanatory

variable for team performance. This suggests that it is profitable to invest in an increase of the resources at the level of interpersonal relationships (i.e., between colleagues in the teams). The resources "cohesion" and "harmony" appeared to be most strongly associated with team performance, through cynicism. This is consistent with the assumptions of Shea and Guzzo (1987), who argue that interdependence is one of the most important predictors of team effectiveness. In addition, these findings are in line with the theoretical model of Guzzo and Campbell (1990) which assumes that the provision of social resources by the organization is an important determinant of objective team performance. Organizations may mobilize such resources by investing in team development. Training sessions could focus on the development of effective team communication and use roleplay to promote team decision making and to facilitate collaboration between team members.

Acknowledgements

We thank Garry Hall for proofreading the manuscript.

References

Altman, D. G. (1991). *Practical statistics for medical research.* London: Chapman and Hall.

Arbuckle, J. L. (2005). *Amos 6.0 user's guide.* Chicago, IL: SPSS, Inc.

Baba, W., Jamal, M., & Tourigny, L. W. (1998). Work and mental health: A decade of Canadian research. *Canadian Psychology*, *39*, 94–107.

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

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

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

Bakker, A. B., Schaufeli, W. B., Sixma, H. J., Bosveld, W., & 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.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.

Behrman, D. N., & Perreault, W. D. J. (1982). Measuring performance of industrial persons. *Journal of Business Research*, *10*, 355–370.

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 & Francis.

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

Campbell, J. P. (1990). Modeling the performance prediction problem in industrial and organizational psychology. In M. D. Dunnette, & L. M. Hough (Eds), *Handbook of industrial and organizational psychology* (pp. 687–732). Palo Alto, CA: Consulting Psychologists 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.

Demerouti, E., & Bakker, A. B. (2006). Employee well-being and job performance: Where we stand and where we should go. In S. McIntyre, & J. Houdmont (Eds), *Occupational health psychology: European perspectives on research, education and practice, Vol. 1* (pp. 83–111). Castelo da Maia, Portugal: ISMAI Publications.

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

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

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology. *Journal of Counseling Psychology*, *51*, 115–134.

Gardner, D. G., & Cummings, L. L. (1988). Activation theory and job design: Review and reconceptualization. In B. M. Staw, & L. L. Cummings (Eds), *Research in organizational behavior, Vol. 10* (pp. 81–122). Greenwich, CT: JAI Press.

Geurts, S. A. E., Taris, T. W., Kompier, M. A. J., Dikkers, J. S. E., Van Hooff, M. L. M., & Kinnunen, U. M. (2005). Work–home interaction from a work psychological perspective: Development and validation of a new questionnaire, the SWING. *Work & Stress*, *19*, 319–339.

Gladstein, D. (1984). Groups in context: A model of task group effectiveness. *Administrative Science Quarterly*, *29*, 499–517.

Guzzo, R. A., & Campbell, R. J. (1990). Conditions for team effectiveness in management. Paper presented at the Academy of Management, San Francisco, CA.

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

Halbesleben, J. R. B., & Buckley, M. R. (2004). Burnout in organizational life. *Journal of Management*, *30*, 859–879.

Harman, H. H. (1967). *Modern factor analysis*. Chicago: University of Chicago Press.

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

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: Clarendon Press.

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.

Jehn, K. A. (1994). Enhancing effectiveness: An investigation of advantages and disadvantages of value-based intragroup conflict. *The International Journal of Conflict Management*, *3*, 223–228.

Jehn, K. A. (1995). A multi-method examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly*, *40*, 256–282.

Jöreskog, K. G., & Sörbom, D. (1993). *Lisrel 8: Structural equations modeling with the SIMPLIS Command Language*. Chicago: Scientific Software International.

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

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

LeBlanc, P. (1994). *De steun van de leiding: Een onderzoek naar het Leader Member Exchange model in de verpleging* [Support from management. A study on the Leader Member Exchange model among nurses]. Unpublished doctoral thesis, Utrecht University, Utrecht.

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 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.

Leung, D. Y. P., & Lee, W. W. S. (2006). Predicting intention to quit among Chinese teachers: Differential predictability of the components of burnout. *Anxiety, Stress, and Coping*, *19*, 129–141.

Lykken, D. T. (1968). Statistical significance in psychological research. *Psychological Bulletin*, *70*, 151–159.

Marsh, H. W., Balla, J. R., & Hau, K. T. (1996). An evaluation of incremental fit indices: A clarification of mathematical empirical properties. In G. A. Marcoulides, & R. E. Schumacker (Eds), *Advanced structural equation modeling, issues techniques* (pp. 315–353). Mahwah, NJ: Lawrence Erlbaum.

Maslach, C. (1993). Burnout: A multidimensional perspective. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds), *Professional burnout: Recent developments in theory and research* (pp. 19–32). Washington, DC: Taylor & Francis.

Maslach, C., & Jackson, S. E. (1986). *Maslach Burnout Inventory: Second edition*. Palo Alto, CA: Consulting Psychologists Press.

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

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

Muchinsky, P. M. (1993). *Psychology applied to work*. Pacific Grove, CA: Brooks/Cole.

Nowack, K. M., & Hanson, A. L. (1983). The relationship between stress, job performance, and burnout in college student resident assistants. *Journal of College Student Personnel*, *24*, 545–550.

O'Leary Kelly, A. M., Martocchio, J. J., & Frink, D. D. (1994). A review of the influence of group goals on group performance. *Academy of Management Journal*, *37*, 1285–1301.

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.

Podsakoff, P. M., & MacKenzie, S. B. (1994). An examination of the psychometric properties and nomological validity of some revised and reduced substitutes for leadership scales. *Journal of Applied Psychology*, *79*, 702–713.

Posner, B. Z., & Kouzes, J. M. (1988). Development validation of the Leadership Practices Inventory. *Educational and Psychological Measurement*, *48*, 483–496.

Posner, B. Z., & Kouzes, J. M. (1994). An extension of the Leadership Practices Inventory to individual contributors. *Educational and Psychological Measurement*, *54*, 959–966.

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

Roe, R. A. (1999). Work performance: A multiple regulation perspective. In C. L. Cooper, & I. T. Robertson (Eds), *International review of industrial and organizational psychology, Vol. 14* (pp. 231–335). Chichester: Wiley.

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

Schaufeli, W. B., Leiter, M. P., Maslach, C., & Jackson, S. E. (1996). The MBI-General Survey. In C. Maslach, S. E. Jackson, & M. P. Leiter (Eds), *Maslach Burnout Inventory Manual* (3rd edn, pp. 19–26). Palo Alto, CA: Consulting Psychologists Press.

Schaufeli, W. B., & Van Dierendonck, D. (2000). *Utrechtse burnout schaal: Handleiding*. [Utrecht burnout scale: Manual]. Lisse, The Netherlands: Swets & Zeitlinger.

Schutte, N., Toppinnen, S., Kalimo, R., & Schaufeli, W. B. (2000). The factorial validity of the Maslach Burnout Inventory-General Survey across occupational groups and nations. *Journal of Occupational and Organizational Psychology*, *73*, 53–66.

Shea, G. P., & Guzzo, R. A. (1987). Groups as human resources. In K. M. Rowland, & G. R. Ferris (Eds), *Research in personnel human resources management* (pp. 323–356). Greenwich, CT: JAI Press.

Shirom, A. (2005). Reflections on the study of burnout. *Work & Stress*, *19*, 263–270.

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.

Sternberg, R. J. (1994). The PRSVL model of person–context interaction in the study of human potential. In M. G. Rumsey, C. B. Walker, & J. H. Harris (Eds), *Personnel selection and classification* (pp. 317–332). Hillsdale, NJ: Lawrence Erlbaum.

Taris, T. W. (2006). Is there a relationship between burnout and objective performance? A critical review of 16 studies. *Work & Stress*, *20*, 316–334.

Taris, T. W, LeBlanc, P. M., Schaufeli, W. B., & Schreurs, P. J. G. (2005). Are there causal relationships between the dimensions of the Maslach Burnout Inventory? A review and two longitudinal tests. *Work & Stress*, *19*, 238–255.

Ursprung, A. W. I. (1986). Incidence and correlates of burnout in residential service settings. *Rehabilitation Counseling Bulletin*, *29*, 225–239.

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 work demands with a questionnaire]. Amsterdam: NIA.

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

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.

Zedeck, S., Maslach, C., Mosier, K., & Skitka, L. (1988). Affective response to work and quality of family life: Employee and spouse perspectives. *Journal of Social Behavior Psychology*, *3*, 135–157.

Zwerts, C., Schaufeli, W. B., Keijsers, G., LeBlanc, P. M., & Reis Miranda, D. (1995). Burnout en prestatie in intensive care units [Burnout and performance in intensive care units]. *Tijdschrift Sociale Gezondheidszorg*, *73*, 382–389.