Job Resources Boost Work Engagement, Particularly When Job Demands Are High

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This study of 805 Finnish teachers working in elementary, secondary, and vocational schools tested 2 interaction hypotheses. On the basis of the job demands–resources model, the authors predicted that job resources act as buffers and diminish the negative relationship between pupil misbehavior and work engagement. In addition, using conservation of resources theory, the authors hypothesized that job resources particularly influence work engagement when teachers are confronted with high levels of pupil misconduct. In line with these hypotheses, moderated structural equation modeling analyses resulted in 14 out of 18 possible 2-way interaction effects. In particular, supervisor support, innovativeness, appreciation, and organizational climate were important job resources that helped teachers cope with demanding interactions with students.

Keywords: conservation of resources, job demands–resources model, teachers, work engagement

Several studies have shown that disruptive student behavior is an important predictor of teachers' strain (e.g., Boyle, Borg, Falzon, & Baglioni, 1995; Evers, Tomic, & Brouwers, 2004; Kinnunen & Salo, 1994). For example, Burke, Greenglass, and Schwarzer (1996), in their longitudinal study of 362 teachers and school administrators, found that in addition to red tape and lack of supervisor support, confrontation with disruptive students was an important predictor of burnout over a 1-year interval. This suggests that pupil misconduct undermines the work engagement many idealistic teachers start with (Serow, 1994).

The central aim of the present study was to investigate the role of job resources in this process. We used the job demands–resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) to examine the potential buffering role of job resources in the relationship between pupil misbehavior and work engagement. In addition, we used conservation of resources theory (Hobfoll, 1989, 2002) to test the coping hypothesis that job resources are particularly relevant when teachers are confronted with high job demands.

What Is Work Engagement?

Engagement is defined as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli & Bakker, 2004; Schaufeli, Salanova, González-Romá, & Bakker, 2002). *Vigor* refers to high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence in the face of difficulties. Dedication refers to a sense of significance, enthusiasm, inspiration, pride, and challenge. The third dimension of work engagement is called *absorption,* which was found to be another element of engagement in 30 in-depth interviews (Schaufeli et al., 2001). Absorption is characterized by being fully concentrated and happily engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work.

Building on the earlier ethnographic work of W. A. Kahn (1990), who conceptualized engagement at work as "the harnessing of organizational members' selves to their work roles" (p. 694), May, Gilson, and Harter (2004) introduced a three-dimensional concept of engagement similar to the one described earlier. Although their labels differ slightly, their operationalization is strikingly similar (Schaufeli & Salanova, in press). More specifically, May et al. distinguished between a physical component (e.g., "I exert a lot of energy performing my job"), an emotional component (e.g., "I really put my heart into my job"), and a cognitive component (e.g., "Performing my job is so absorbing that I forget about everything else"), which correspond to Schaufeli and Bakker's (2004) dimensions of vigor, dedication, and absorption, respectively.

Several studies have indicated that work engagement has positive consequences at the individual and organizational levels. For instance, in their weekly diary study among 54 starting teachers, Bakker and Bal (2006) found that daily levels of work engagement were predictive of classroom performance. In addition, Hakanen, Bakker, and Schaufeli (2006) showed that work engagement has predictive value for teachers' organizational commitment (see also Schaufeli & Bakker, 2004). Work engagement among Finnish educational staff was positively associated with self-rated health

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and working ability (Hakanen, 2002). Moreover, in a business context, Harter, Schmidt, and Hayes (2002) showed that levels of employee engagement were positively related to business-unit performance (i.e., customer satisfaction and loyalty, profitability, productivity, turnover, and safety). Harter et al. concluded that engagement is "related to meaningful business outcomes at a magnitude that is important to many organizations" (Harter et al., 2002, p. 276). Results from in-depth interviews suggest that engaged employees work long hours but that they lack the obsession to work that is characteristic for workaholics (Schaufeli et al., 2001). Engaged employees do not neglect their social life outside work; rather, they enjoy things in their lives other than work. They also spend time on socializing and hobbies and work as volunteers (see also Schaufeli & Salanova, in press).

Engagement is measured with the Utrecht Work Engagement Scale, which includes the three subscales of Vigor, Dedication, and Absorption. This scale has been validated among Spanish (Schaufeli, Salanova, et al., 2002), Finnish (Hakanen, 2002), and Dutch employees (Schaufeli & Bakker, 2004). All investigations used confirmatory factor analyses and showed that the hypothesized three-factor structure is superior to that of any other alternative factor structure. In addition, the internal consistencies of the three subscales proved to be sufficient in each study.

The JD-R Model

The JD-R model (Bakker & Demerouti, 2007; Bakker, Demerouti, De Boer, & Schaufeli, 2003; Bakker, Demerouti, & Verbeke, 2004; Demerouti et al., 2001) is a heuristic model that specifies how employee well-being may be produced by two specific sets of working conditions. The first set concerns job demands that represent characteristics of the job that potentially evoke strain, in case they exceed the employee's adaptive capability. More specifically, job demands are those physical, social, or organizational aspects of the job that require sustained physical and/or psychological (i.e., cognitive or emotional) effort on the part of the employee and are therefore associated with certain physiological and/or psychological costs (e.g., exhaustion; cf. Hockey, 1997). Although job demands are not necessarily negative, they may turn into job stressors when meeting those demands requires high effort from which the employee does not adequately recover (Meijman & Mulder, 1998).

This is in line with Rudow (1999), who argued that teachers' cognitive and emotional workload may evoke chronic fatigue and finally burnout, which may lead to psychosomatic disorders and complaints as well as restrictions in pedagogical performance. Indeed, Burke et al. (1996) showed that teachers who were confronted with disruptive students were most likely to report burnout symptoms 1 year later. In addition, Bakker et al. (2000) and Taris, Van Horn, Schaufeli, and Schreurs (2004) showed that lack of reciprocity in teachers' relationships with students predicts burnout. In the relationship with students, teachers' investments may include their enthusiasm and effort. These investments are reciprocated when students react with gratitude or when there exists a good classroom atmosphere. Investments are not reciprocated when students are inattentive, disrespectful, and bored. If this lack of reciprocity turns into a chronic condition, whereby teachers continuously give more than they receive in return, it may eventually deplete teachers' emotional resources and, thus, foster the development of the burnout syndrome and physical health prob-

lems (see also Blase, 1986; Borg & Riding, 1991; Farber, 1991; Melamed, Shirom, Toker, Berliner, & Shapira, 2006).

The second set of working conditions concerns the extent to which the job offers resources to individual employees. Job resources are those physical, psychological, social, or organizational aspects of the job that (a) reduce job demands and the associated physiological and psychological costs, (b) are functional in achieving work goals, or (c) stimulate personal growth, learning, and development (Demerouti et al., 2001). Hence, not only are resources necessary to deal with job demands but they are also important in their own right (Hobfoll, 2002). Resources may be located at the following levels: the organization (e.g., salary, career opportunities), interpersonal and social relations (e.g., supervisor and coworker support), the organization of work (e.g., role clarity, participation in decision making), and the task (e.g., performance feedback, skill variety). In general, job demands and resources are negatively related because job demands, such as high work pressure and emotionally demanding interactions with students, may preclude the mobilization of job resources (see Bakker, Demerouti, Taris, et al., 2003; Demerouti et al., 2001). In a similar vein, high job resources, such as social support and feedback, may reduce job demands.

An important 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) lead to constant overtaxing and, in the long run, to exhaustion (e.g., Lee & Ashforth, 1996; Wright & Cropanzano, 1998). Exhaustion, in turn, may lead to negative consequences for the organization, such as absenteeism (Bakker, Demerouti, De Boer, & Schaufeli, 2003) and impaired in-role performance (Bakker et al., 2004). In the second process proposed by the JD-R model, job resources lead to engagement and positive outcomes (Schaufeli & Bakker, 2004). For instance, Bakker et al.'s (2004) study of human service professionals (including teachers) showed that job resources lead to dedication and extra-role performance. This is consistent with Leithwood, Menzies, Jantzi, and Leithwood (1999), who suggested that schools may develop commitment to the collectively held goals of the organization by providing teachers with opportunities to become increasingly competent and by developing shared decision-making possibilities (i.e., job resources). These job resources, in turn, encourage personal investment in the work and success of the school organization. However, when schools do not provide or reward teachers with job resources, the long-term consequence is withdrawal from work and reduced motivation and commitment (Bakker, Demerouti, & Schaufeli, 2003). This leads to our first hypothesis:

> *Hypothesis 1:* Job resources are positively related to work engagement.

Job Resources as Buffers

The JD-R model also postulates that job resources may buffer the impact of job demands on strain, including burnout. Typically, the buffering hypothesis explains interactions between job demands (i.e., stressors) and job resources by proposing that the relationship between job demands and strain is weaker for those enjoying a high degree of job resources (Caplan, Cobb, French, Van Harrison, & Pinneau, 1975). Applied to work engagement, the negative relationship between job demands and work engagement

is weaker for those enjoying high job resources. This hypothesis is consistent with the demand–control model (Karasek, 1979) and the effort–reward imbalance model (Siegrist, 1996). The demand–control model claims that job control or autonomy may buffer the influence of workload on strain, whereas the effort–reward imbalance model states that rewards (in terms of salary, esteem reward, and security/career opportunities, i.e., promotion prospects, job security, and status consistency) may buffer the influence of effort (extrinsic job demands and intrinsic motivation to meet these demands) on strain. The JD-R model conceptually integrates and expands these models by claiming that several different job resources can play the role of buffer for several demanding working conditions. Which job demands and resources play a role in a certain organization or occupation depends on the specific job characteristics that prevail. Whereas the demand–control model states that autonomy may buffer the impact of work and time pressure on job strain, the JD-R model expands this view and states that many different types of job resources may buffer the undesirable influence of job demands, including disruptive student behaviors.

Indeed, in a recent study of over 1,000 teachers at a large institute for higher education, Bakker, Demerouti, and Euwema (2005) showed that several job demands influenced burnout only if teachers possessed few job resources (autonomy, social support, supervisory coaching, and feedback). In a similar vein, in their study among four home-care organizations, Bakker, Demerouti, Taris, et al. (2003) found evidence for the buffering role of job resources. More specifically, they found that the relationship between job demands (e.g., workload, physical demands, and patient harassment) and feelings of exhaustion disappeared when home-care professionals possessed many resources (e.g., autonomy, opportunities for professional development, performance feedback).

The buffer hypothesis is consistent with the work of R. L. Kahn and Byosiere (1992), who argued that the buffering or interaction effect can occur between any pair of variables in the stressor–strain sequence. They claimed that properties of the work situation, as well as characteristics of the individual, can buffer the effects of a stressor. The buffering variable can reduce the tendency of organizational properties to generate specific stressors, can alter the perceptions and cognitions evoked by such stressors, and can moderate responses that follow the appraisal process or reduce the health-damaging consequences of such responses (R. L. Kahn & Byosiere, 1992, p. 622). Social support is probably the most well-known situational variable that has been proposed as a potential buffer against job stress (e.g., Haines, Hurlbert, & Zimmer, 1991; Johnson & Hall, 1988; see Van der Doef & Maes, 1999, for a review). Other characteristics of the work situation that may act as moderators are (a) the extent to which the onset of a stressor is predictable (e.g., feedback), (b) the extent to which the reasons for the presence of a stressor are understandable (e.g., through information provided by supervisors), and (c) the extent to which aspects of the stressor are controllable by the person who must experience it (e.g., job autonomy; R. L. Kahn & Byosiere, 1992).

In the present study of teachers, we included six job resources that have been identified as major motivators that either increase commitment or engagement among teachers or—when lacking—increase burnout: job control (e.g., De Heus & Diekstra, 1999; Taris, Schreurs, & van Iersel-van Silfhout, 2001), supervisor support (e.g., Coladarci, 1992; Friedman, 1999; Leiter & Maslach, 1988; Rosenholtz & Simpson, 1990; Smylie, 1999), information

(Leithwood et al., 1999), organizational climate (e.g., Friedman, 1991; Kremer-Hayon & Kurtz, 1985; Travers & Cooper, 1993), innovativeness (Rosenholtz, 1989; Smylie, 1999), and appreciation (Bakker et al., 2005; Van Horn, Schaufeli, & Taris, 2001). On the basis of this literature, we formulated the following hypothesis:

Hypothesis 2: Job resources buffer the negative relationship between pupil misbehavior and work engagement. More specifically, the relationship between pupil misbehavior and work engagement is weaker for employees with many (vs. few) resources.

The Salience of Resources Under Stressful Conditions

According to conservation of resources theory (Hobfoll, 1989, 2002), people seek to obtain, retain, and protect that which they value (e.g., material, social, personal, or energetic resources). The theory proposes that stress experienced by individuals can be understood in relation to potential or actual loss of resources. More specifically, Hobfoll and Shirom (2001) have argued that (a) individuals must bring in resources to prevent the loss of resources, (b) individuals with a greater pool of resources are less susceptible to resource loss, (c) those individuals who do not have access to strong resource pools are more likely to experience increased loss (loss spiral), and (d) strong resource pools lead to a greater likelihood that individuals will seek opportunities to risk resources for increased resource gains (gain spiral). Hobfoll (2002) has additionally argued that resource gain itself has only a modest effect but instead acquires its saliency in the context of resource loss.

We located three studies supporting this latter hypothesis, all of which referred to occupations outside education. Billings, Folkman, Acree, and Moskowitz (2000) studied men who were caregivers for individuals with AIDS and found that those who used social support coping maintained their positive emotional states under conditions of stress. Consequently, these caregivers experienced fewer physical symptoms, thus supporting the importance of resource gain in the context of loss. Similarly, Riolli and Savicki (2003) showed that information service workers' personal resources (optimism and control coping) were particularly beneficial when work resources were low. Finally, Seers, McGee, Serey, and Graen (1983) showed that for those employees who had to cope with high role conflict, job satisfaction was predicted by social support. However, for those not experiencing stress caused by role conflict, social support was inconsequential for job satisfaction. Seers et al. suggested that for persons experiencing low levels of stress, the use of the social support resource is unnecessary. However, under stressful conditions, individuals are more likely to use resources as a coping mechanism or stress-reducing action. Taken together, conservation of resources theory and these three studies offer theoretical and empirical support for the notion that resources are particularly salient in the context of loss. Thus, we predicted the following:

Hypothesis 3: Job resources particularly influence work engagement (vigor, dedication, and absorption) when teachers are confronted with high levels of pupil misbehavior. More specifically, the relationship between job resources and work engagement is strongest when teachers are exposed to high (vs. low) pupil misbehavior.

The difference between the buffer and the coping hypotheses is simply the pattern of the interaction predicted. The method of testing the statistical significance of interactions, moderated structural equation modeling (MSEM; Cortina, Chen, & Dunlap, 2001), reflects no distinction between patterns of interactions. Either of the two specific patterns can be found by inspecting the complex association between pupil misbehavior, job resources, and work engagement.

Method

Procedure and Participants

The data for this study were obtained as a part of a developmental project in the Education Department of Helsinki, Finland. In the beginning of 2001, a questionnaire was delivered to all the schools in the East, Northeast, and Southeast districts of Helsinki. Teachers were kindly requested to respond to the questionnaire and to send it anonymously in a prepaid envelope to Jari J. Hakanen. In total, 805 teachers working in elementary, secondary, and vocational schools participated in this study (response rate = 52%). There was no possibility to send reminders to those who did not respond to the questionnaire, which explains the moderate response rate.

Our sample seems representative of the population of Finnish teachers. The mean age of the teachers in our sample was 41.3 years ($SD = 10.7$), compared with 44 years in the whole of Finland, and the proportion of female teachers was 81%, compared with 68% in Finland (Statistics Finland, 2004). In addition, 79% of the teachers in our sample were working in elementary or lower secondary schools (67% in Finland), 10% were in upper secondary schools (11% in Finland), and 11% were in vocational schools (21% in Finland). The proportion of teachers in vocational schools was underrepresented in the sample because the Education Department of Helsinki mainly runs basic education and is only partly responsible for vocational education. Participants' mean teaching job tenure was 13.5 years ($SD = 10.1$), and they reported that they worked 37.0 hr per week ($SD = 8.41$) on average. Because the background variables were only marginally related to the model variables, they were excluded from all further analyses.

Measures

Work engagement was assessed with the Finnish version of the Utrecht Work Engagement Scale (Schaufeli, Salanova, et al., 2002). The factorial validity of the Finnish version of this scale has been demonstrated in previous research (Hakanen, 2002). The instrument includes three subscales: Vigor, Dedication, and Absorption. Vigor was assessed with six items (e.g., "At my work, I feel bursting with energy," "When I get up in the morning, I feel like going to work"). Dedication was measured with five items (e.g., "I am enthusiastic about my job," "I find the work that I do full of meaning and purpose"). Absorption was assessed with six items (e.g., "I am immersed in my work," "When I am working, I forget everything else around me"). Items were rated on a 7-point scale, ranging from 0 = *never* to 6 = *always*. Several studies have demonstrated the (cross-national) validity, reliability, and stability of the Utrecht Work Engagement Scale (e.g., Schaufeli & Bakker, 2004; Schaufeli, Martinez, Marques-Pinto, Salanova, & Bakker, 2002; Schaufeli, Salanova, et al., 2002; Storm & Rothman, 2003).

Pupil misbehavior was measured with a six-item scale adapted from Kyriacou and Sutcliffe (1978). Respondents first read an overall question ("As a teacher, how great a source of stress are the following factors to you?") and were then requested to react to six specific behaviors or situations, such as "noisy pupils," "pupils who show a lack of interest," and "maintaining class discipline." The items were scored on a 5-point scale, ranging from 1 = *hardly ever* to 5 = *very often*.

Most of the six scales measuring job resources were derived from the Healthy Organization Barometer (Lindström, 1997; Lindström, Hottinen, & Bredenberg, 2000). The Healthy Organization Barometer has been validated in several occupational groups in Finland. The instrument has been translated into several languages and has been used in many multinational organizations functioning in Finland and elsewhere (Lindström, 1997). Each job resource was assessed with three items. Here is an example for each job resource: "In general, how much influence do you have over your work and things that concern you at work?" (job control); "Does your supervisor provide help and support when needed?" (supervisor support); "Is the flow of information at your workplace between the management and the personnel sufficient?" (information); "What is the work climate like in your unit? . . . Encouraging and supportive of new ideas?" (organizational climate); "How often do the following aspects occur in your work? . . . We regularly make improvements in our work" (innovativeness); and "Do your colleagues appreciate your work?" (appreciation). All the items that were used to assess the job resources were scored on a 5-point scale ranging from 1 = *hardly ever* to 5 = *very often*. Higher scores on these scales refer to more job resources.

Statistical Analyses

To test our hypotheses, we conducted MSEM analyses, using the AMOS software package (Arbuckle, 1997). The covariance matrix was analyzed with the maximum-likelihood method. We preferred MSEM to hierarchical regression analyses because MSEM allows us to assess and correct for measurement error. Additionally, MSEM provides measures of fit of the models under study. To apply MSEM analyses, we followed the procedure proposed by Mathieu, Tannenbaum, and Salas (1992), as described by Cortina et al. (2001).

For each hypothesized interaction effect, we tested a model that included three exogenous variables (pupil misbehavior, each of the six job resources, and the interaction between pupil misbehavior and each of the six resources) and three endogenous variables (vigor, dedication, and absorption). In total, we tested six different models, one for each possible interaction between pupil misbehavior and the job resources included in the study. Each exogenous variable had only one indicator that was the standardized (centered) scale score of the respective variable (Mathieu et al., 1992). The indicator of the latent interaction variable was the multiplication of the standardized scale scores of the pupil misbehavior variable and each job resource tested. For example, the model that tested the interaction effect of pupil misbehavior and job control on the three dimensions of work engagement included one pupil misbehavior variable (whose indicator was the z score of the pupil misbehavior scale), one job control variable (whose indicator was the z score of the job control scale), and the interaction variable (whose indicator was the multiplicative result of the z score of pupil misbehavior and the z score of job control).

For the three endogenous latent variables, we followed Bagozzi and Edwards's (1998) recommendation to use partial disaggregation models. To construct item parcels, we performed preliminary principal components factor analyses for each of the three dependent variables separately. Yuan, Bentler, and Kano (1997) recommended averaging those variables with the same factor structure. The factor analysis regarding vigor resulted in two distinguished factors. The first factor included Items 1, 2, and 6, and the second factor included Items 3, 4, and 5. Thus, instead of including all six items of the Vigor scale as indicators of the latent vigor factor, we formed two composites by combining the items that resulted from the factor analysis. Factor analyses regarding dedication and absorption resulted in one factor each. In these cases, item parceling was based on the items' relative errors. In other words, variables in each group with roughly equal relative errors were averaged (Yuan et al., 1997). Thus, we created two composites by combining the first two and last three items of the Dedication scale; we created two other composites by combining the first three and the last three items of the Absorption scale. It is important to note that decisions on item parceling were also dependent on whether the constructed composites had acceptable reliabilities.

The models included direct paths from the three exogenous variables (pupil misbehavior, job resources, and their interactions) to the three endogenous variables (vigor, dedication, and absorption). The pupil misbehavior and job resources variables were allowed to correlate, whereas correlations between pupil misbehavior and job resources and the interaction term were expected to be zero. Furthermore, the residual errors of the three outcome variables were allowed to correlate. Finally, the paths from the latent exogenous factors to their indicators were fixed with the square roots of the scale reliabilities, whereas the error variances of each indicator were set equal to the product of their variances and one minus their reliabilities. For more details regarding the calculation of the reliability score of the interaction term, we refer to Cortina et al. (2001). Figure 1 graphically represents the model that was applied for each of the six job resources separately.

The fit of the models was assessed with the chi-square statistic, the goodness-of-fit index (Hoyle, 1995), and the root-mean-square error of approximation (MacCallum, Browne, & Sugawara, 1996). It is suggested that goodness-of-fit values that exceed .90 and root-mean-square error of approximation values as high as .08 are indicative of a good fit. A significant interaction effect is evident when the path coefficient from the interaction variable to the endogenous variables is statistically significant. The final step for confirming the significance of an interaction is to test the model with and without the path from the latent interaction variable to the
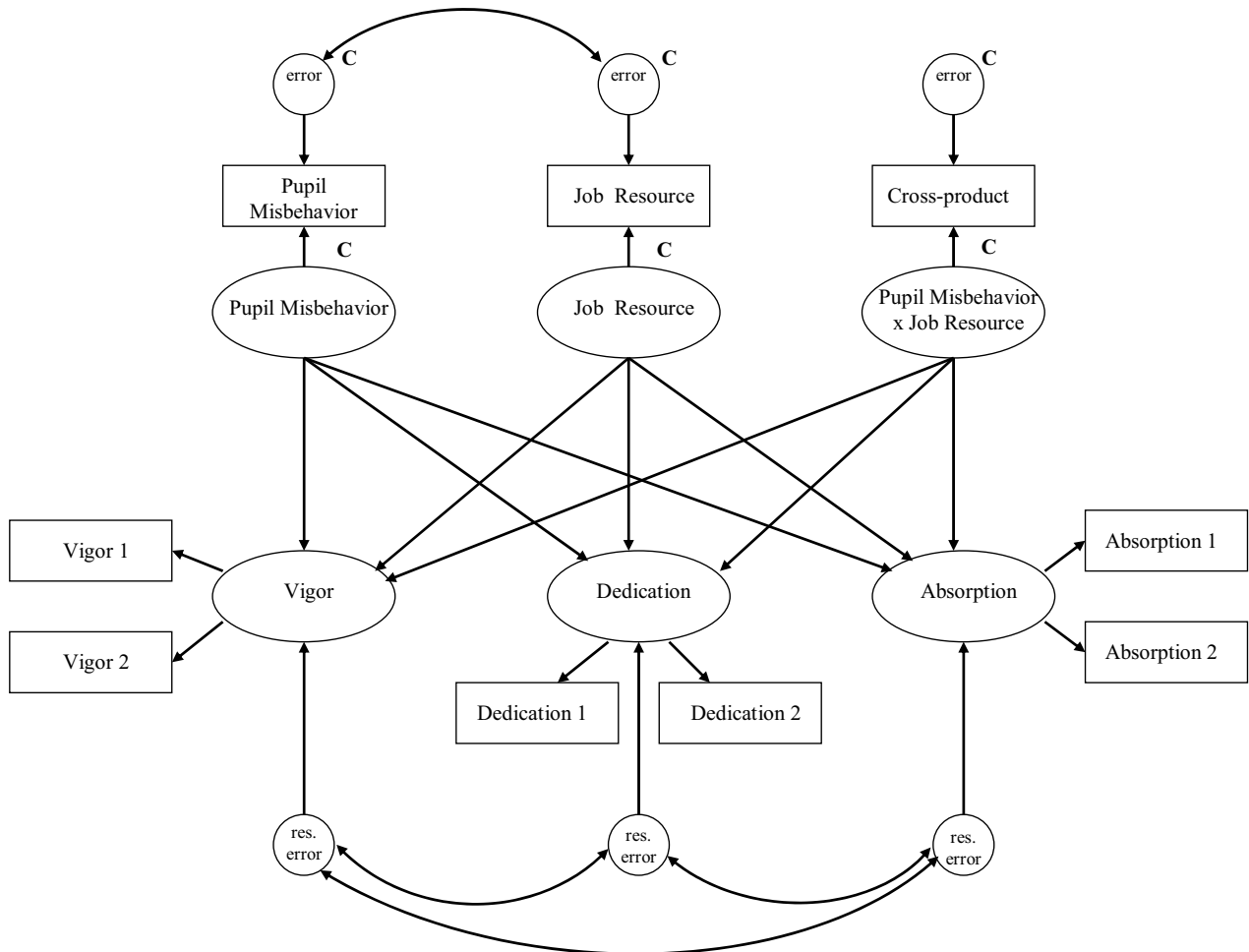

Figure 1. The study model is shown. All constrained paths and error variances are marked with **C**. res. error = residual error.

endogenous variables and to compare the two models on the basis of the chi-square statistic. Visual examination of the pattern of interactions was used to assess whether it confirmed Hypothesis 2 or Hypothesis 3. For Hypothesis 2, the buffer hypothesis, the effect of pupil misbehavior on work engagement was examined within high and low job resources subgroups. For Hypothesis 3, the coping hypothesis, the effect of job resources on work engagement was examined within high and low pupil misbehavior subgroups.

Results

Descriptive Statistics

Table 1 shows the means, standard deviations, correlations, and internal consistencies of all scales included in this study. The internal consistencies of the scales are generally good because Cronbach's alphas are all well above .70, with one exception (appreciation has an alpha of .62). The six job resources were weakly or not at all correlated with pupil misbehavior, and the intercorrelations between the six job resources were weak to moderately high.

Direct Effects

Results of the MSEM analyses are presented in Table 2. As expected, pupil misbehavior was negatively related to each of the three work engagement dimensions in all the models tested (Serow, 1994). Furthermore, and consistent with Hypothesis 1, all six job resources (job control, supervisor support, climate, innovativeness, information, and appreciation) were positively related to vigor, dedication, and absorption (Demerouti et al., 2001; Hobfoll, 2002). Of all job resources tested, appreciation appeared to be the strongest predictor of all work engagement dimensions (see Table 2).

Interactions Between Pupil Misbehavior and Job Resources

The results of MSEM analyses provided strong support for the predicted interaction effects. As can be seen in Table 2, five out of six job resources moderated the effect of pupil misbehavior on vigor and absorption, whereas four job resources interacted with pupil misbehavior regarding the dedication dimension of work engagement. Job control was the only job resource that did not interact significantly with pupil misbehavior in predicting the

dimensions of engagement. Additionally, information did not have a moderator effect on the relationship between pupil misbehavior and dedication. Supervisor support, organizational climate, innovativeness, and appreciation had moderation effects on the relationship between pupil misbehavior and all three dimensions of work engagement. Furthermore, all models showed a good fit to the data (see Table 2).

In cases where MSEM analyses resulted in a significant interaction effect, the fit of the model with and without the path from the latent interaction variable to the endogenous variables was compared. In all cases, chi-square difference tests showed that the fit of the models with the path from the latent interaction variable to the endogenous variables was significantly better than the models with no such path, thus further supporting these interaction effects. Taken together, 14 out of 18 interaction terms (78%) had a significant and unique effect on engagement.

To examine the direction of the effects, we derived graphical representations of the interaction effects from the simple slope analyses (Aiken & West, 1991; Frazier, Tix, & Barron, 2004). For the significant interactions, we inspected plots of the relationship between pupil misbehavior and work engagement within high and low job resources subgroups to test Hypothesis 2 (buffering). The subgroups were built by taking those who scored one standard deviation below and above the mean on the six resources. For the high resources group, the slopes ranged from $b = -.42$ to $b = -.56$ for vigor, from $b = -.39$ to $b = -.45$ for dedication, and from $b = -.45$ to $b = -.68$ for absorption. In the low job resources group, the slopes were substantially lower or zero and ranged from $b = -.03$ to $b = -.22$ for vigor, from $b = -.01$ to $b = -.21$ for dedication, and from $b = .00$ to $b = -.22$ for absorption. All the interactions showed a similar pattern and supported both our hypotheses. Thus, job resources mitigated the negative effect of the key job demand in teachers' profession (i.e., pupil misbehavior) on work engagement. For illustrative purposes, Figures 2A, 2C, and 2E display one significant interaction (buffering) effect for each dimension of work engagement with different job resources.

In the last step, plots of work engagement on job resources within high and low pupil misbehavior subgroups were examined for the same significant interactions. Job resources were strongly related to work engagement for those experiencing high levels of pupil misbehavior (slopes ranged from $b = .45$ to

Table 1

Means, Standard Deviations, Internal Consistencies (Cronbach's Alphas on the Diagonal), and Correlations Between the Study Variables (N = 805)

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1. Pupil misbehavior	3.24	0.92	(.86)									
2. Job control	3.42	0.78	−.17[***]	(.73)								
3. Supervisor support	3.09	1.03	−.04	.27[***]	(.85)							
4. Information	3.58	0.67	.04	.23[***]	.49[***]	(.84)						
5. Climate	3.67	0.91	.03	.27[***]	.55[***]	.55[***]	(.87)					
6. Innovativeness	3.19	0.74	−.02	.17[***]	.56[***]	.47[***]	.56[***]	(.75)				
7. Appreciation	3.84	0.55	−.12[***]	.32[***]	.49[***]	.36[***]	.41[***]	.33[***]	(.62)			
8. Vigor	4.51	0.98	−.19[***]	.27[***]	.21[***]	.16[***]	.18[***]	.16[***]	.40[***]	(.80)		
9. Dedication	4.71	1.09	−.25[***]	.29[***]	.28[***]	.20[***]	.23[***]	.21[***]	.53[***]	.76[***]	(.86)	
10. Absorption	3.92	1.33	−.17[***]	.18[***]	.11[**]	.04	.08[*]	.07[*]	.26[***]	.62[***]	.57[***]	(.86)

[*] $p < .05$. [**] $p < .01$. [***] $p < .001$.

Table 2
Results of Moderated Structural Equation Modeling: Interactions of Pupil Misbehavior and Job Resources (N = 805)

Predictor	Vigor		Dedication		Absorption		Fit		
	UPC (SE)	SPC	UPC (SE)	SPC	UPC (SE)	SPC	χ^2	GFI	RMSEA
Pupil misbehavior	−.14 (.03)	−.22***	−.21 (.04)	−.23***	−.17 (.05)	−.15***			
Job control	.20 (.03)	.34***	.26 (.03)	.30***	.19 (.04)	.19***			
Pupil Misbehavior × Job Control	.05 (.03)	.07	.02 (.04)	.03	.04 (.05)	.04			
R^2	20%		17%		7%		102.84	.97	.08
Pupil misbehavior	−.18 (.03)	−.28***	−.25 (.04)	−.28***	−.21 (.05)	−.18***			
Supervisor support	.19 (.03)	.29***	.30 (.04)	.32***	.15 (.05)	.13***			
Pupil Misbehavior × Supervisor Support	.06 (.03)	.10*	.11 (.04)	.13**	.15 (.05)	.14***			
R^2	18%		21%		7%		103.97	.97	.08
Pupil misbehavior	−.19 (.03)	−.29***	−.27 (.04)	−.30***	−.21 (.04)	−.18***			
Climate	.18 (.03)	.29***	.24 (.03)	.27***	.11 (.04)	.10*			
Pupil Misbehavior × Climate	.08 (.03)	.13**	.11 (.04)	.13**	.17 (.05)	.16***			
R^2	18%		17%		7%		108.82	.97	.08
Pupil misbehavior	−.18 (.03)	−.28***	−.26 (.04)	−.29***	−.21 (.04)	−.18***			
Innovativeness	.13 (.03)	.21***	.21 (.03)	.25***	.09 (.04)	.08*			
Pupil Misbehavior × Innovativeness	.07 (.03)	.13**	.09 (.04)	.11**	.18 (.05)	.18***			
R^2	14%		16%		7%		95.21	.97	.08
Pupil misbehavior	−.19 (.03)	−.29***	−.27 (.04)	−.30***	−.20 (.05)	−.18***			
Information	.15 (.03)	.24***	.20 (.03)	.23***	.05 (.04)	.05			
Pupil Misbehavior × Information	.06 (.03)	.10*	.06 (.04)	.07	.09 (.04)	.09*			
R^2	15%		14%		4%		101.45	.97	.08
Pupil misbehavior	−.15 (.03)	−.24***	−.22 (.03)	−.24***	−.18 (.04)	−.17***			
Appreciation	.27 (.03)	.50***	.45 (.03)	.57***	.27 (.04)	.29***			
Pupil Misbehavior × Appreciation	.13 (.03)	.20***	.21 (.04)	.23***	.20 (.05)	.19***			
R^2	38%		48%		16%		134.21	.96	.09

Note. The *df* of all models is 17. UPC = unstandardized path coefficient; SPC = standardized path coefficient; GFI = goodness-of-fit index; RMSEA = root-mean-square error of approximation.
* $p < .05$. ** $p < .01$. *** $p < .001$.

$b = .63$ for vigor, from $b = .41$ to $b = .69$ for dedication, and from $b = .29$ to $b = .63$ for absorption) and were unrelated or weakly related for those experiencing low levels of pupil misbehavior (slopes ranged from $b = .12$ to $b = .24$ for vigor, from $b = .15$ to $b = .23$ for dedication, and from $b = −.13$ to $b = .12$ for absorption). These results support Hypothesis 3 by demonstrating that job resources particularly influence engagement under conditions of high job demands. For illustrative purposes, Figures 2B, 2D, and 2F display one significant interaction (coping) effect for each dimension of work engagement with different job resources.

Discussion

The present study shows that supervisor support, innovativeness, information, appreciation, and organizational climate can all be considered important job resources for teachers because each of these conditions was able to buffer the negative impact of pupil misbehavior on work engagement. In line with our hypothesis, a series of MSEM analyses resulted in 14 out of 18 significant two-way interactions. Thus, different combinations of job resources and pupil misbehavior explained significant amounts of the variance in vigor, dedication, and absorption over and above the main effects. These findings are consistent with earlier research (among home-care professionals and teachers at a higher education institution) on the buffer hypothesis in the JD-R model, which showed conceptually similar results—namely, that several job resources can buffer the impact of job demands on burnout (Bakker, Demerouti, Taris, et al., 2003; Bakker et al., 2005). Moreover,

we were able to integrate and study simultaneously in one model many different general as well as profession-specific job demands and resources that are known from previous studies to influence teachers' well-being.

Probably the most innovative theoretical contribution made by this study is that it shows that job resources are particularly relevant under highly stressful conditions. Consistent with conservation of resources theory (Hobfoll, 1989, 2002) and previous research in other domains (Billings et al., 2000; Seers et al., 1983), the results show that supervisor support, innovativeness, appreciation, and organizational climate particularly influenced teachers' work engagement when pupil misbehavior was an important job demand, thus providing support for our coping hypothesis. This suggests that job resources supply strategies for dealing with the stress caused by pupil misbehavior. Job resources may be of less concern to individuals not experiencing a significant amount of stress (cf. Seers et al., 1983). In the sense of the demand–control–support model, this represents active jobs that combine the reason and the facilities to enhance motivation for learning new behavior patterns (Karasek & Theorell, 1990). At the same time, findings suggest that pupil misconduct was not as detrimental for teachers' work engagement when they received support and appreciation from their supervisor and colleagues and when they worked within a school context that favored innovativeness and had a supportive climate. This provides clear support for the buffering hypothesis that has been studied in the literature somewhat more extensively than the coping hypothesis.

The reason why job resources both have motivational potential and can act as buffers is most probably different for different
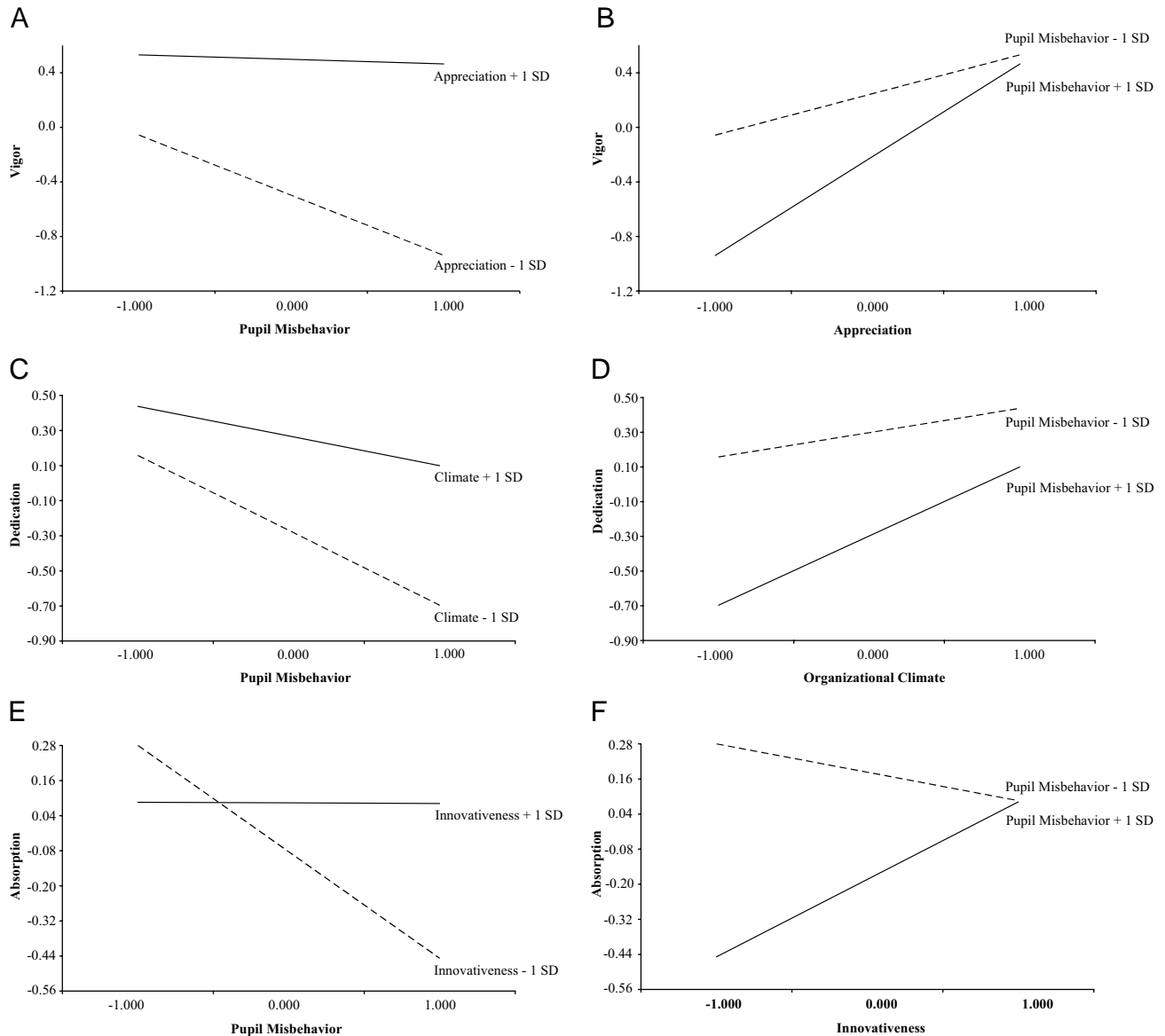
Figure 2. A: The effect of appreciation on the relationship between pupil misbehavior and vigor (cf. buffer hypothesis). B: Appreciation particularly influences vigor when teachers are confronted with high levels of pupil misbehavior (cf. coping hypothesis). C: The effect of organizational climate on the relationship between pupil misbehavior and dedication (cf. buffer hypothesis). D: Organizational climate particularly influences dedication when teachers are confronted with high levels of pupil misbehavior (cf. coping hypothesis). E: The effect of innovativeness on the relationship between pupil misbehavior and absorption (cf. buffer hypothesis). F: Innovativeness particularly influences absorption when teachers are confronted with high levels of pupil misbehavior (cf. coping hypothesis).

resources. For example, supervisor support may alleviate the influence of job demands on strain because supervisors' appreciation and support puts demands in another perspective. Leaders' appreciation and support may also aid the teachers in coping with their job demands, facilitate performance, and act as a protector against ill health (Väänänen et al., 2003). In contrast, organizational climate and innovativeness may be crucial for work engagement because they keep teachers' work interesting and challenging and offer them opportunities for self-growth. Appreciation helps maintain teachers' motivation and signals them to continue in a certain

direction (Hackman & Oldham, 1980). Taken together, these findings clearly expand the JD-R model and suggest that teachers facing demanding working conditions can be helped by offering them the right resources. Next to the unique contribution of job demands and resources proposed by the JD-R model (i.e., that job demands lead to overtaxing and exhaustion and that job resources lead to work engagement), the present study shows convincingly that the interaction between job demands and resources adds to the prediction of work engagement. Thus, not only do job demands and job resources have unfavorable and favorable effects, respec-

tively, on work engagement (as is the case when studied in isolation) but also their combination is predictive of the degree of work engagement. Namely, in 14 out of 18 cases, job control, supervisor support, information, climate, innovativeness, and appreciation did not result in high levels of work engagement if teachers did not experience pupil misbehavior. Conceptually, the current findings replicate Riolli and Savicki's (2003) study showing that personal resources (optimism and control coping) were most beneficial when work resources were low.

It is noteworthy that job control (in addition to information) was unable to buffer the negative relationship between pupil misbehavior and work engagement. Previous studies on the demand–control model (Karasek, 1979) have produced mixed results regarding the demand–control interaction effect as well (Van der Doef & Maes, 1999). Some authors have argued that the lack of evidence for demand–control interactions can be attributed to the fact that many researchers study homogeneous groups, leaving little room for variance on the predictor variables. The current study clearly investigated a homogeneous group as well but nevertheless showed that several different job resources can play the role of buffer for demanding working conditions. Which job demands and resources play a role in a certain occupational context apparently depends upon the specific job characteristics that prevail. Thus, whereas the demand–control model states that autonomy buffers the impact of work overload and time pressure on job strain, the JD-R model challenges this view and states that many different types of job resources can buffer the undesirable influence of job demands.

Results of the present study also challenge the idea that specific job demands and job resources should match in order to show moderating effects in the prediction of well-being (de Jonge & Dormann, 2003; Frese, 1999). This line of thinking is referred to as the *matching hypothesis*: If the type of available resources (e.g., emotional support, appreciation) corresponds to existing stressors (e.g., pupil misbehavior), then those resources are best able to mitigate the effects of those stressors, and less strain will result (cf. Viswesvaran, Sanchez, & Fisher, 1999). According to de Jonge and Dormann (2006), the discovery of optimal stressor–resource combinations could help in understanding better how specific stressors threaten and how specific resources protect employees from developing strain or even enhance their well-being. However, the present study does not support the matching hypothesis. For example, the results show that innovativeness and organizational climate—variables conceptually unrelated to pupil misconduct—were able to buffer the negative impact of pupil misbehavior on work engagement. In other words, we found that buffer effects also exist when demands and resources do not match, thus raising doubts regarding the generalizability of the matching hypothesis.

Limitations

Frese (1999) argued that it is usually difficult to trace significant interaction effects. It is therefore remarkable that in the present study, we found evidence for 14 out of 18 interactions (78%). However, it should be noted that effect sizes for interactions are usually small, especially in nonexperimental studies (Frazier et al., 2004). This means that the practical implications of the present study may be limited: Job resources can buffer only part of the negative influence of job demands on work engagement. Nevertheless, we believe that the interactions are important from a

theoretical perspective because they shed light on the combination of different working conditions that may foster work engagement.

Another drawback of the study is its cross-sectional nature, which implies that it is impossible to make causal statements because of temporal ambiguity. However, the findings are clearly in line with two theories, namely, the JD-R model (Bakker, Demerouti, & Schaufeli, 2003; Demerouti et al., 2001) and conservation of resources theory (Hobfoll, 1989, 2002). In addition, it seems unlikely that work engagement could predict the exact combinations of job demands and resources (interaction terms) found in the current study. Finally, this study was based on self-report questionnaires. Even though employees' perceptions of the work environment, as expressed through the questionnaires, are an important source of information, perceptions do not necessarily reflect objective reality. Therefore, it would be useful if future research could replicate the findings using a combination of self-reports and other-ratings of demands and resources.

Practical Implications

We have recently developed several Internet applications of the JD-R model, in which teachers, secretaries, general practitioners, and managers who fill in an electronic questionnaire receive online feedback on their computer screen about the most important demands and resources of their job. This means for teachers that they receive tailor-made feedback not only about their emotional demands, pupil misbehavior, and so on but also about the availability of job resources (e.g., supervisor support, innovativeness, appreciation, and organizational climate). An evaluation of one of these instruments (Bakker, Schaufeli, Bulters, van Rooijen, & ten Broek, 2002) suggests that—at the personal level—the combination of certain high demands and lack of resources is most predictive of symptoms of burnout and that the presence of job resources fosters work engagement, particularly under conditions of high demands. Thus, the interactions also appear to have practical significance, even though their contribution to explaining variance in work engagement for large groups of employees seems limited.

Such information can be used for individual-level job (re)design, where teachers and school management (or occupational health professionals, personal coaches, etc.) discuss the possibilities for adjusting the work environment to the needs and abilities of individual teachers and facilitate the fit between person and organization. For example, the results of the present study have been discussed in several seminars and workshops among Finnish teachers, principals, and administrative staff to encourage the identification and promotion of the potential and actual job resources at schools and to meet the often inevitable job demands in the teaching profession.

The general pattern found in the present study suggests that job resources are rather important to motivate teachers. Because previous research has suggested that engaged employees are less inclined to leave the organization (Schaufeli & Bakker, 2004) and are more willing to help their colleagues when needed (Bakker et al., 2004), it can be concluded that school organizations may benefit from an investment in the resources at work.

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