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A three-wave study of job resources, self-efficacy, and work engagement among Italian schoolteachers

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By utilizing a three-wave longitudinal design, the present study tested the motivational process of the Job Demands-Resources model among Italian schoolteachers ($N=104$). Specifically, it aims to test how job resources, self-efficacy and work engagement are related over time. Results of structural equation modelling analysis showed that the model with reciprocal relationships between resources and work engagement exhibited the best fit with the data. Job resources and self-efficacy had a short- (4 months) and longer term (8 months) lagged effect on work engagement, but the reverse pattern was true as well: Work engagement had a short- and long-term lagged effect on job resources and self-efficacy. These findings suggest that is important to think in terms of reciprocity: Resourceful environments and self-efficacy beliefs mean engaged teachers, and vice versa.

Keywords: Job resources; Self-efficacy; Teachers; Three-wave longitudinal design; Work engagement.

Teaching has been identified as a particularly stressful occupation (Chaplain, 2008; Montgomery & Rupp, 2005). A large body of research shows that teachers are particularly at risk of stress, and that this is an international phenomenon (Chan, 2002; Farber, 1991; van Horn, Schaufeli, Greenglass, & Burke, 1997). At the same time, however, it should be noted that many teachers are satisfied with and enthusiastic about their work (Roth, Assor, Kanat-Maymon, & Kaplan, 2007;

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Rudow, 1999), and that they are engaged in their jobs (Hakanen, Bakker, & Schaufeli, 2006).

To date, most models of occupational health have focused exclusively on job stress and negative outcomes, while neglecting the potentially positive effects of work, such as engagement (Schaufeli, Bakker, & van Rhenen, 2009). The recently developed Job Demands–Resources (JD-R) model, however, has extended our knowledge of this phenomenon by postulating a more comprehensive approach that also includes positive aspects of well-being (e.g., work engagement).

The aim of the current study is to investigate the motivational process of the JD-R model in a longitudinal way by examining how job resources, self-efficacy, and work engagement are related over time.

THE MOTIVATIONAL PROCESS OF THE JOB DEMANDS–RESOURCES MODEL

According to the motivational process of the JD-R model, the motivational potential of job resources induces employees to fulfil their work goals and, in turn, may lead to work engagement. Job resources are the physical, psychological, social, or organizational aspects of the job that are functional to achieving work goals, reducing job demands and related physiological and psychological costs, and stimulating personal growth and development (Bakker & Demerouti, 2007). The motivational process is driven by the availability of job resources, which, by definition, perform a motivational role because they foster the growth, learning and development of employees, or are instrumental in achieving work goals (Bakker, 2008). According to Deci and Ryan (2000), job resources fulfil basic human needs, such as autonomy, relatedness, and competence. In addition, the motivational role of job resources may be explained by the effort-recovery approach (Meijman & Mulder, 1998), according to which work environments that offer many resources foster the willingness of employees to devote their efforts and abilities to work tasks. In such environments, it is likely that the task will be completed successfully and that the work goal will be attained. Hence, job resources are likely to foster work engagement through a motivational process which satisfies basic needs for autonomy, relatedness, and competence, and which increases the likelihood of attaining one's work goals.

Work engagement is defined as a positive, fulfilling, work-related state of mind characterized by vigour (i.e., high levels of energy and mental resilience at work, willingness to invest effort in work, and persistence in the face of difficulties), dedication (i.e., being involved in one's work, sense of enthusiasm, inspiration, pride, and challenge), and absorption (i.e., being happily engrossed in one's work, so that time passes quickly

and one has difficulties in detaching oneself from work) (Schaufeli, Salanova, González-Romá, & Bakker, 2002). Vigour and dedication are considered to be the core components of work engagement (Schaufeli & Bakker, 2004), whereas absorption seems similar to flow, that is, a state of optimal experience (Csikszentmihalyi, 1990). Therefore, only these two engagement dimensions were examined in the analysis reported.

There is substantial evidence supporting the association between job resources and work engagement (e.g., Hakanen et al., 2006; Llorens, Bakker, Schaufeli, & Salanova, 2006; Schaufeli & Bakker, 2004). This is also in line with the Conservation of Resources (COR) theory (Hobfoll, 1989), according to which people seek to obtain, retain, foster, and protect resources. COR theory predicts that stress occurs when resources are threatened or when individuals fail to gain resources after substantive resource investment. Consequently, COR theory predicts that those with greater resources (e.g., more supportive colleagues) are less vulnerable to stress, whereas those with fewer resources (e.g., less supportive colleagues) are more vulnerable to it. Viewed in this light, job resources play an important role in reinforcing positive images of self, and in fostering positive work outcomes like work engagement (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001).

In the current study, we included three job resources identified as important motivators that increase engagement in teachers: (1) social support from the supervisor (Hakanen et al., 2006; Klusmann, Kunter, Trautwein, Ludtke, & Baumert, 2008), (2) social support from colleagues (Kelchtermans & Strittmatter, 1999), and (3) opportunities to learn and develop (Hawley & Valli, 1999). Support from supervisor and co-workers may be particularly important when the social support/engagement relationship is examined (Schaufeli et al., 2009; Xanthoupolou, Bakker, Demerouti, & Schaufeli, 2009). With regard to the possibility of achieving personal development via work, Karasek and Theorell (1990) argued that jobs conducive to learning opportunities may result in employees being intrinsically involved in their jobs. Personal development is also expected in jobs with high levels of (method and time) control, and opportunities for skill enhancement, decision making, and responsibility (Dunckel, 2002). Moreover, opportunities to learn are deemed important particularly for Italian teachers because they may be important resources for coping with the changes introduced in recent years by reforms of the school system (e.g., new tasks concerning the local management of schools, appraisal of teaching performance).

Therefore, we formulated the first hypothesis:

Hypothesis 1: Job resources lead to work engagement.

SELF-EFFICACY AND WORK ENGAGEMENT

An important recent extension of the JD-R model is the inclusion of personal resources as well, which are those aspects of the self linked with resilience, and they concern the perception of individuals that they can successfully control and impact upon their environment (Hobfoll, Johnson, Ennis, & Jackson, 2003). Xanthopoulou, Bakker, Demerouti, and Schaufeli (2007) examined the role of three personal resources (self-efficacy, organization-based self-esteem, and optimism) in predicting exhaustion and work engagement. Results of structural equation modelling analyses showed that personal resources partly mediated the relationship between job resources and work engagement. Furthermore, in their study of female school principals, Bakker, Gierveld, and van Rijswijk (2006) found that those with most personal resources scored highest on work engagement. Resilience, self-efficacy and optimism contributed particularly to work engagement, and were able to explain unique variance in engagement scores (in addition to job resources).

In our analysis we considered self-efficacy as a personal resource. Social Cognitive Theory (Bandura, 1997, *p.* 3) defines self-efficacy as: “belief in one’s capabilities to organize and execute the course of action required to produce given attainments”. Self-efficacy contributes to motivation by influencing the challenges that people pursue, the effort they spend, and their perseverance in the face of obstacles (Bandura, 1989). Although most research has focused on the moderating role of self-efficacy in the relationship between stressors and strain (Salanova, Peiró, & Schaufeli, 2002; Stetz, Stetz, & Bliese, 2006), less attention has been paid to its relationship with positive states like work engagement (Salanova, Schaufeli, Xanthopoulou, & Bakker, 2010). There is some evidence, however, that self-efficacy may act as an important determinant of work engagement (Llorens, Schaufeli, Bakker, & Salanova, 2007). Indeed, self-efficacy acts as a self-motivating mechanism: People perceive their levels of competences to be high, and consequently set themselves goals and are motivated to spend considerable effort and persistence in overcoming obstacles (Bandura, 2001).

Thus, we formulated the following hypothesis:

Hypothesis 2: Self-efficacy leads to work engagement.

REVERSED AND RECIPROCAL RELATIONSHIPS BETWEEN WORK ENGAGEMENT AND JOB AND PERSONAL RESOURCES

Although a wide range of resources has been examined by cross-sectional studies, only a few types of job and personal resources have been examined

by longitudinal studies (de Lange, de Witte, & Notelaers, 2008). This implies that most studies used a unidirectional view on the relations between resources and work engagement, that is, job and personal resources are assumed to influence work engagement but not vice versa. Some studies have shown, however, that job characteristics and well-being seem to influence each other, which shows that it is important to think in terms of reciprocity. In other words, there are good reasons to expect a model with opposite pathways to be equally valid with work engagement facilitating the mobilization of job and personal resources (Bakker & Demerouti, 2007; Hakanen, Schaufeli, & Ahola, 2008). This is consistent with COR theory (Hobfoll, 1989, 2002) as well as the broaden-and-build theory (Fredrickson, 1998, 2001).

According to the COR theory, people are motivated to create resources because resources are valued either in their own right or because they enable the acquisition or preservation of other valued resources. Indeed, people invest resources in order to protect against future resource loss, recover their resources, and gain new resources. Salanova, Bakker, and Llorens (2006) carried out a two-wave longitudinal study among secondary schoolteachers to investigate the relationship between personal resources (i.e., self-efficacy) and job resources (i.e., social support climate and clear goals), on the one hand, and work-related flow—a psychological state akin to work engagement—on the other. Using structural equation modelling (SEM) analyses, they found that the teachers' personal and job resources at the beginning of the academic year predicted their levels of flow at the end of the academic year, 8 months later. Simultaneously, teachers' flow at the start of the academic year predicted both types of resources at the end of the academic year. Thus, a reciprocal relationship was observed between resources and teachers' well-being, which is compatible with the notion of gain spirals proposed by COR theory.

The broaden-and-build theory suggests that distinct positive emotions (e.g., joy, interest, enthusiasm, love, pride) share the ability to *broaden* people's momentary thought-action repertoires and *build* their enduring personal resources, including physical, intellectual, social, and psychological resources (Fredrickson, 2001). Viewed in this light, work engagement is a *distinct* positive affective-motivational state that may broaden employees' thought-action repertoires and build their enduring personal resources (Salanova et al., 2010). For instance, Hakanen, Perhoniemi, and Toppinen-Tanner (2008), in their two-wave study of a large sample of Finnish dentists, found that work engagement may broaden dentists' coping and action repertoires, including their levels of personal initiative (i.e., active and initiative-taking behaviour that goes beyond formal work requirements). Focusing on the build part of the theory, Xanthopoulou et al. (2009) hypothesized that work engagement, by stimulating self-enhancement

through learning and goal achievement (i.e., broadening), builds job resources (e.g., autonomy and opportunities for professional development) and personal resources (self-efficacy, organization-based self-esteem, and optimism) over time.

On the basis of this overview, we formulated the following two hypotheses:

Hypothesis 3a: Work engagement leads to job resources.

Hypothesis 3b: Work engagement leads to self-efficacy.

METHOD

Procedure and participants

The current study was part of a broader research project on teachers' well-being. To test our hypotheses, we conducted a three-wave panel study with a time lag of approximately 4 months between each wave. The three waves corresponded to the beginning of the academic year (T1), the end of the first term (T2), and the end of the academic year (T3). We assumed that this time interval would be adequate because Italian teachers spend three consecutive months on holiday after the end of the school year, during which period they can presumably recuperate (see Westman & Etzion, 2001). According to Zapf, Dormann, and Frese (1996), it is common practice in longitudinal research to choose the particular time lag for organizational reasons rather than theoretical considerations. These authors also suggest that multiwave designs should be conducted with the same time interval between all the waves.

After information meetings of school principals and teachers' representatives at each school, 465 teachers received a paper-and-pencil questionnaire and a return envelope at their school. The questionnaire was accompanied by a letter signed by the coordinator of the university research unit which briefly explained the general aim of the research and emphasized that the answers would be confidential and anonymous. The teachers were requested to fill out the questionnaire within 10 days of its delivery and to post it in a special box at their school to guarantee complete privacy. In total, 299 completed this first questionnaire (response rate: 64.3%). Four months after the first measurement, teachers received the second questionnaire. At Time 2, school principals were again asked to remind their teachers to fill out the questionnaires. This time, 166 (35.7% of the original sample) questionnaires were returned. The third questionnaire (again, 4 months after the second measurement) was filled out and returned by 108 teachers (23.2%). Hence 108 teachers completed the questionnaire on all

three occasions. The teachers were asked to fill in a personal code on all three questionnaires. The participants' anonymity was thus ensured and the university researchers were able to match the questionnaires for each participant.

To test whether drop-outs differed from the panel group, we compared teachers in the panel group ($N=108$) with the drop-outs ($N=191$) with regard to demographic characteristics (i.e., gender, type of school, marital status, age, job tenure, type of contract) and also engagement dimensions, job, and personal resources. The results from chi-square tests showed that the panel group differed from the drop-outs in terms of job tenure, $\chi^2(4)=11.04$, $p < .05$, and type of contract, $\chi^2(2)=12.81$, $p < .01$. In particular, the panel group comprised more teachers with fixed-term contracts, as well as teachers with little teaching experience. There were no significant differences between the panel group and the drop-outs with regard to the mean values of the engagement dimensions, as well as job and personal resources, Wilks' $\lambda = 0.97$, $F(6, 292) = 1.53$, $p = .169$. We therefore concluded that the drop-outs were comparable with the panel group and that, with the exception of tenure and type of contract, no selective drop-out had occurred.

Data screening analysis was conducted to check deviations from normality (i.e., kurtosis and skewness) and to detect univariate and multivariate outliers. We dropped from the analysis three cases that presented kurtosis and skewness values $> |1|$ on our variables. After application of the critical value of Mahalanobis distance, one multivariate outlier was identified and subsequently dropped from the analysis. Thus, a total of 104 subjects were finally included in the analysis.

The final panel group ($N = 104$) consisted of 94 female (90%) and 10 male (10%) teachers working in different types of schools (34% in elementary schools; 52% in lower secondary, and 14% in upper secondary schools). Some 72% were married. Most respondents were middle-aged; only 14% of the teachers were aged 35 and under, 26% were aged between 36 and 45, 27% between 46 and 50, and 33% were aged over 50. Most respondents had considerable length of service; 51% of them had over 20 years of teaching experience. About 91% of the sample had permanent jobs, and 9% had some type of fixed-term contract. On average, participants worked 30.8 hours per week ($SD = 7.5$).

Measures

Work engagement

This was assessed by use of the vigour and dedication subscales of the Italian adaptation of the short version of the Utrecht Work Engagement Scale

(UWES; Schaufeli, Bakker & Salanova, 2006; Italian version: Simbula, Guglielmi, Schaufeli, & Depolo, 2008). Vigour was measured by three items (e.g., “At my job, I feel strong and vigorous”) as well as dedication (e.g., “I’m enthusiastic about my job”). All items in both scales were scored on a 7-point frequency rating scale ranging from 0 (“never”) to 6 (“always”).

Job resources

Opportunities to learn and to develop were assessed with five items from the Psychosocial Work Environment and Stress Questionnaire (PWSQ; Agervold & Mikkelsen, 2004; Italian version: Guglielmi, Paplomatas, Simbula, & Depolo, 2009). This scale assesses the possibility of employing one’s abilities and the perceived meaningfulness of one’s work. Sample item: “The job provides me with ample opportunities to use my skills and qualifications”. Responses were given on a frequency scale ranging from 1 (“never”) to 5 (“very often”).

Co-workers’ support. The four-item Social Support Scale of the job content instrument (Karasek, 1985; Italian version: Cenni & Barbieri, 1997) was used to measure co-workers’ support. Sample item: “People I work with are helpful in getting the job done”.

Supervisor support. The four-item Supervisor Support Scale of the job content instrument (Karasek, 1985; Italian version: Cenni & Barbieri, 1997) was used to measure supervisor support (that is, support from the school principal). Sample item: “My supervisor is successful in getting people to work together”.

In both support scales, responses were given on a 4-point Likert scale ranging from 1 (“strongly disagree”) to 4 (“strongly agree”).

Personal resources

Teacher self-efficacy was assessed by an eight-item scale (Di Fabio & Taralla, 2006). Participants responded on a 5-point scale which ranged from 1 (“totally false”) to 5 (“totally true”). Sample item: “Thanks to my resources I’m able to manage unexpected situations in my job”.

Strategy of analysis

Structural equation modelling (SEM) analyses as implemented by the AMOS software package (Arbuckle, 2003) using Maximum Likelihood Estimation methods were used to establish the relationships between the study variables. Before testing our hypotheses, we examined a series of

competing models in order to support the operationalization of the three job resources (opportunities to learn and to develop, social support from colleagues and from supervisor) and both work engagement components (vigour and dedication) as underlying dimensions of an overall job resources factor and an overall work engagement factor, respectively. For job resources, we compared an uncorrelated, first-order confirmatory factor analysis (CFA) (where the three job resources with their respective items were represented as independent constructs) with a second-order model (where the items of each scale loaded on the respective underlying factor, and the three specific job resources loaded on an overall job resource factor). Since we considered only the two core components of work engagement, we compared a two-factor model with a nested alternative model: We developed a nested model by setting a covariation between the two variables that equalled one (Lewis, Welsh, Dehler, & Green, 2002; Miron, Erez, & Naveh, 2004). The analyses for both job resources and work engagement were conducted for all three waves separately. The results supported the representation of the three job resources in one general job resource factor, since the higher order model showed a better fit than the first-order model: (for T1, $\Delta\chi^2(3)=27.85$, $p < .001$; for T2, $\Delta\chi^2(3)=22.94$, $p < .001$; for T3, $\Delta\chi^2(3)=29.28$, $p < .001$). Concerning work engagement, results confirmed that the one-factor model yielded an acceptable fit for all waves. A chi-square difference test showed that the fit of the nested model did not differ significantly from the two-factor model: for T1, $\Delta\chi^2(1)=0.08$, *ns*; for T2, $\Delta\chi^2(1)=0.92$, *ns*; for T3, $\Delta\chi^2(1)=2.13$, *ns*. Because, however, a more parsimonious model is preferable (even if two models have roughly equivalent fit) (Jöreskog & Sörbom, 1993), we chose to represent the two work engagement dimensions with one general work engagement factor. This finding was also consistent with Schaufeli, Bakker, and Salanova's (2006) suggestion that, rather than computing three different scores for vigour, dedication, and absorption, researchers might consider using the total UWES score as an indicator of work engagement. The output of these preliminary CFAs is available from the first author upon request.

Owing to small sample size, we reduced the number of freely estimated parameters by using manifest variables (Jöreskog & Sörbom, 1993; Xanthopoulou et al., 2009). We calculated the weighted factor scores of our variables by using second-order principal axis factoring (PAF) analysis with Varimax rotation of the three job resources, the two work engagement dimensions and all items of self-efficacy. The advantage of this method is that it takes into account the factor loading of each sub-dimension of each item while calculating the factor score. PAF analyses resulted in one job resources factor (35% of explained variance at T1, 30% at T2, and 36% at T3), one work engagement factor (80% of explained variance at T1, 81% at

T2, and 83% at T3), and one self-efficacy factor (51% of explained variance at T1, 54% at T2, and 60% at T3).

To test our hypotheses, a number of nested models were fitted to the data. First, the Stability Model (M1) was tested without cross-lagged structural paths, but with autocorrelations and synchronous correlations. The autocorrelations were specified as correlations between the corresponding errors of each construct across the three measurement waves. Synchronous correlations were specified as correlations between the errors of the constructs measured at the same time (Pitts, West, & Tein, 1996). Second, the fit of the stability model was compared with that of three more complex models: (a) the Causality Model (M2), which is identical to the stability model, but includes additional cross-lagged structural paths from T1 job resources and self-efficacy to T2 and T3 work engagement, and from T2 job resources and self-efficacy to T3 work engagement; (b) the Reversed Causation Model (M3), which is identical to the stability model, but includes additional cross-lagged structural paths from T1 work engagement to T2 and T3 job resources and self-efficacy, and from T2 work engagement to T3 job resources and self-efficacy; and (c) the Reciprocal Model (M4), which includes all paths of the causality and reversed causation model.

The various nested models were compared by means of the chi-square test (Jöreskog & Sörbom, 1993). Besides the chi-square statistic, we assessed the Goodness-of-Fit Index (GFI) and the Root Mean Square Error of Approximation (RMSEA). In our analyses, the Non-Normed Fit Index (NNFI) and the Comparative Fit Index (CFI) were also used. Marsh, Balla, and Hau (1996) recommended the latter two indices, because they are less dependent on sample size compared with the chi-square statistic and GFI. The NNFI and CFI indices should have values of .90 or higher (Hoyle, 1995). Moreover, values of RMSEA < .08 indicate a reasonable fit between the model and the data (Browne & Cudeck, 1993).

Because previous studies had found relationships between demographic variables and work engagement (Schaufeli & Salanova, 2008), we controlled for these effects in further analyses by including gender and job tenure in the structural model.

RESULTS

Descriptives

The means, standard deviations, correlations, and internal consistencies for all study variables are presented in Table 1. All significant relationships between the variables were in the expected direction, whereas the moderately high test-retest correlations indicated that participants' perceptions of job resources, self-efficacy, and work engagement are quite stable over time.

TABLE 1
Means, standard deviation, Cronbach's alphas (in parentheses along the diagonal), and correlations among the study variables (N = 104)

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Gender (0 = female; 1 = male)	0.10	0.30	—										
2. Job tenure (0 = until 10 years; 1 = more than 10 years)	0.76	0.44	.06	—									
3. Job Resources T1	3.46	0.44	.00	-.10	(.84)								
4. Job Resources T2	3.43	0.45	-.08	.01	.73**	(.84)							
5. Job Resources T3	3.43	0.46	.07	.04	.76**	.76**	(.85)						
6. Self-Efficacy T1	3.83	0.68	.07	.12	.19	.17	.15	(.89)					
7. Self-Efficacy T2	3.82	0.71	-.11	.19	.25*	.33**	.25*	.68**	(.91)				
8. Self-Efficacy T3	3.84	0.72	-.12	.14	.26*	.16	.28**	.52**	.46**	(.92)			
9. Work Engagement T1	4.59	1.07	-.12	-.19	.67**	.55**	.54**	.40**	.42**	.41**	(.92)		
10. Work Engagement T2	4.56	1.04	-.06	-.12	.66**	.59**	.57**	.34**	.44**	.34**	.81**	(.92)	
11. Work Engagement T3	4.58	1.03	-.10	-.16	.62**	.57**	.60**	.29**	.38**	.45**	.80**	.78**	(.93)

T1 = Time 1; T2 = Time 2; T3 = Time 3. * $p < .05$, ** $p < .01$.

Internal consistency for all variables ranged between .84 and .93 (Table 1); thus, all values of Cronbach's alpha satisfied the value of .80 that is now a generally accepted standard (Henson, 2001). Correlations between the three job resources, the two engagement dimensions, and self-efficacy can be provided by the first author upon request.

As can be seen from Table 2, the fit with the data of the causality model (M2) is superior to that of the stability model. Furthermore, the reversed causation model (M3) fitted the data significantly better than the stability model. Finally, the reciprocal causation model (M4) fitted significantly better than M1, M2 and M3. This suggests that the model including reciprocal relationships among job resources, self-efficacy, and work engagement explained the underlying structure of the data best. According to Hypothesis 1, job resources lead to work engagement over time. Specifically, M2 assessed this hypothesis and showed that T1 job resources had unique effects on T2 and T3 work engagement. The path from T2 job resources to T3 work engagement was, however, nonsignificant. Therefore, we found partial support for H1. Hypothesis 2 stated that self-efficacy would have a lagged positive effect on work engagement. In line with this hypothesis, we found one significant effect of T1 self-efficacy on T2 work engagement. The two other panel paths were, however, nonsignificant in M2. Thus, we found only partial support for H2. Taken together, these

TABLE 2
Goodness-of-fit indices of the nested models ($N = 104$)

<i>Model</i>	χ^2	<i>df</i>	<i>RMSEA</i>	<i>NNFI</i>	<i>GFI</i>	<i>CFI</i>	<i>Model comparison</i>	$\Delta\chi^2$	Δdf
M1. Stability Model	114.49**	31	.16	.75	.85	.86	—	—	—
M2. Causality Model	86.14**	25	.15	.78	.88	.90	M1–M2	28.35**	6
JRT1/SET1 → WET2–T3 JRT2/SET2 → WET3									
M3. Reversed Causation Model	90.05**	25	.16	.76	.89	.89	M1–M3	24.44**	6
WET1 → JRT2–T3/ SET2–T3 WET2 → JRT3/SET3									
M4. Reciprocal Model	27.13	19	.06	.96	.96	.99	M1–M4	87.36**	12
JRT1/SET1 → WET2–T3 JRT2/SET2 → WET3 WET1 → JRT2–T3/ SET2–T3 WET2 → JRT3/SET3							M2–M4 M3–M4	59.01** 62.92**	6 6

JR = Job Resources; SE = Self-Efficacy; WE = Work Engagement; T1 = Time 1; T2 = Time 2; T3 = Time 3; RMSEA = Root Mean Square Error of Approximation; NNFI = Non-Normed Fit Index; GFI = Goodness-of-Fit Index; CFI = Comparative Fit Index. ** $p < .001$.

findings provide partial support for H1 and H2, implying that the availability of job and personal resources leads to work engagement over time, although not consistently so across all three waves.

Hypothesis 3 stated that work engagement leads to job resources (H3a) and self-efficacy (H3b) over time. M3 tested this hypothesis and showed that T1 work engagement related to T2 job resources, as well as T2 and T3 self-efficacy. No significant paths were found between T1 work engagement and T3 job resources and between T2 work engagement and T3 job resources and self-efficacy. Therefore, H3a and H3b were partially supported.

Finally, the results of M4 showed that both causal and reversed causal relationships exist simultaneously. The significant paths of the reciprocal model are graphically presented in Figure 1. T1 work engagement had a significant impact on T2 and T3 job resources, as well as on T2 and T3 self-efficacy. T1 self-efficacy and T1 job resources related to T2 and T3 work engagement.

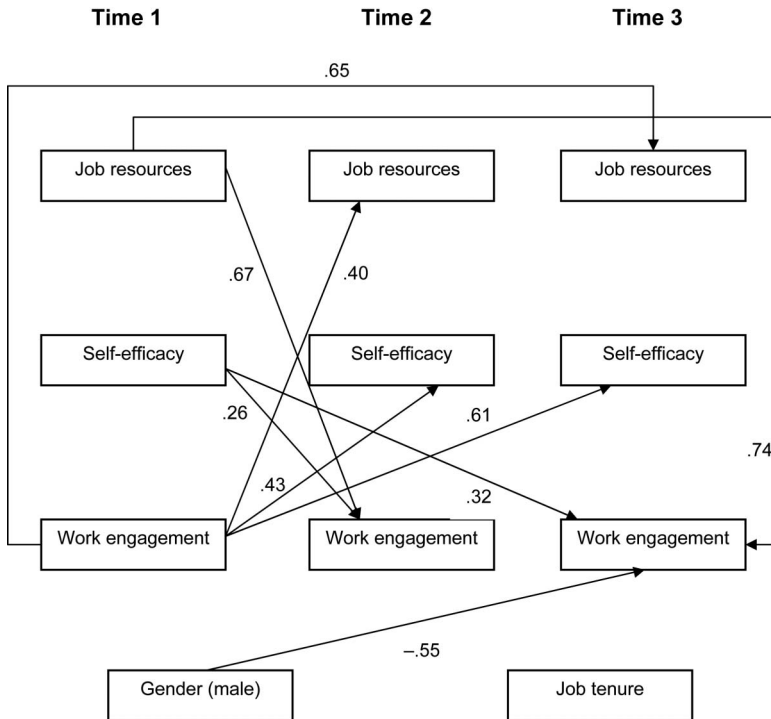


Figure 1. Significant lagged paths ($p < .05$) in the Reciprocal Model (M4). Autocorrelations and synchronous correlations are omitted for reasons of clarity.

DISCUSSION

This longitudinal study of Italian schoolteachers was designed to examine short- and longer term relationships between job resources, self-efficacy, and work engagement by using the general framework of the motivational process of the JD-R model. Job resources, self-efficacy and work engagement were assessed in three different waves with a 4-month time lag between each measurement point. Hence, the whole school year was covered, which consists of two terms, each of which comprises three phases: The first one is devoted to activities planning; the second phase concerns activities monitoring; finally, the third period is dedicated to student performance assessment. This cyclical process owing to the termly structure compelled us to opt for a three-wave longitudinal study.

Our findings are consistent with and expand the findings of other cross-sectional (Hakanen et al., 2006) and longitudinal studies, which have used two measurement points (Llorens et al., 2007; Xanthopoulou et al., 2009). Indeed, as expected, both job and personal resources seem to play a pivotal role in explaining work engagement. This implies that when teachers perceive the possibility of developing new skills to assist students in their learning, feel supported by their colleagues and school principal, and are self-efficacious, they are likely to be more engaged at the end of the first term and the end of the school year (Hakanen et al., 2006; Nir & Bogler, 2008; Salanova et al., 2006). According to the COR theory, adequate job resources (i.e., opportunities to learn and to develop, social support from supervisor, and social support from colleagues) and personal resources (i.e., self-efficacy) are useful for the acquisition of additional resources (i.e., work engagement).

In addition, our results show that work engagement is related to both job resources and personal resources over time, that is, 4 and 8 months later. This finding is in line with Fredrickson's (2001) broaden-and-build theory, which proposes that employees who are engaged—a positive affective state—may build job resources; that is, they are best able to mobilize support from colleagues and supervisor, and to create opportunities to learn and to develop at work. Equally applicable here is Social Cognitive Theory, which suggests that positive emotional states are the main sources of efficacy beliefs (Bandura, 2001). This means that when people feel content and satisfied, they are more likely to believe that they are competent.

Moreover, compared with alternative nested models, the model with reciprocal relationships between resources and work engagement showed a superior fit with the data. According to the results of the cross-lagged SEM analysis, job resources and self-efficacy had a short-term (4 months) and longer term (8 months) lagged effect on work engagement, but the reverse

pattern was true as well: Work engagement had a short-term and longer term lagged effect on job resources and self-efficacy. This means that none of these constructs can be considered as only a cause or only a consequence. As Salanova et al. (2010) note, this is an important finding indicating that resources and engagement may activate and conserve positive conditions, beliefs, and affective states.

These reciprocal relationships seem to function according to the principle of cycles proposed by Hobfoll (2002). COR theory predicts that those who possess more resources are also more capable of resource gain; hence, gaining resources increases the resource pool, which makes it more likely that additional resources will be subsequently acquired.

The hypothesized panel paths were not, however, significant for all waves. In particular, no significant paths were observed from T2 to T3, but this may be explained in terms of the Italian school context. As stated, the academic year consists of two terms, which are organized in almost the same way, given that they both comprise three main phases: (1) activities planning, (2) activities monitoring, and (3) student performance assessment. In the light of our results, we may state that, although there are two formal deadlines in the academic year (the end of the first term and the end of the second one), they may not have the same value for teachers. Indeed, at the end of the first term, teachers have some opportunities that they do not have at the end of the school year. In other words, they may value what it is still possible to change (main subjects, learning objectives, etc.) and they may modify the course of events. This means that the end of the first term is not a real deadline; on the contrary, teachers may consider the academic year as a single longer period with an initial planning phase, a monitoring phase, and a final assessment phase. It is consequently possible to say that the conditions at T1 have an impact on outcomes at T3, whereas the conditions at T2 are not pivotal to the explanation of outcomes at T3.

Study limitations

At least three limitations should be mentioned in evaluation of the present study. First, all data were self-reported, which increases the likelihood of common method variance effects. It would be interesting to use other ratings in future research so as to avoid this problem. On the positive side, however, our research was based on a longitudinal design, which reduced the risks of common method bias (Doty & Glick, 1998). Second, although we carried out a longitudinal study with three waves, the sample size was relatively small. Finally, using only schoolteachers restricts the generalizability of the results to other occupations. We therefore suggest that other organizational contexts should be studied.

Practical implications

One of the advantages of viewing engagement as a process over time is that this enables investigation of the antecedents of this construct, particularly those associated with the school. Specification of the antecedents of work engagement in teachers has both theoretical and applied value. Specifying the variables that contribute to engagement shows how positive functioning can be enhanced. On a practical level, it is valuable for school administrations to be able to specify precisely what causes work engagement. This appears to be very important because the positive consequences of work engagement pertain to individual health, job-related attitudes, extrarole behaviours, and performance (for a review, see Schaufeli & Salanova, 2008).

The training of school principals is also important in order to heighten their sensitivity to the emotional needs of their teachers, to enable them to provide teachers with effective support, and to serve as positive role models. This may lead to the development of better and more effective intervention techniques to improve teacher engagement. Further, training programmes in schools aimed at increasing work engagement could focus on building personal resources (e.g., efficacy beliefs, but also optimism and resiliency). This appears especially important in circumstances where job resources are scarce or have diminished, for instance during “negative” organizational changes (e.g., downsizing following school reforms). Most importantly, our findings, like previous ones (for a review, see Salanova et al., 2010), show that resourceful environments and self-efficacy beliefs contribute to a flourishing—i.e., engaged—workforce, and vice versa.

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