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Reciprocal relationships between job resources, personal resources, and work engagement

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ABSTRACT

This study examined longitudinal relationships between job resources, personal resources, and work engagement. On the basis of Conservation of Resources theory, we hypothesized that job resources, personal resources, and work engagement are reciprocal over time. The study was conducted among 163 employees, who were followed-up over a period of 18 months on average. Results of structural equation modeling analyses supported our hypotheses. Specifically, we found that T1 job and personal resources related positively to T2 work engagement. Additionally, T1 work engagement related positively to T2 job and personal resources. The model that fit best was the reciprocal model, which showed that not only resources and work engagement but also job and personal resources were mutually related. These findings support the assumption of Conservation of Resources theory that various types of resources and well-being evolve into a cycle that determines employees' successful adaptation to their work environments.

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1. Introduction

Work engagement is an affective-motivational, work-related state of fulfillment in employees that is characterized by vigor, dedication and absorption (Schaufeli & Bakker, 2004). Engaged employees have high levels of energy, are enthusiastic about their work, and they are often fully immersed in their job so that time flies (Macey & Schneider, 2008; May, Gilson, & Harter, 2004). Research has shown that the concept of work engagement can be reliably measured (Schaufeli, Bakker, & Salanova, 2006a), and that it can be discriminated from related concepts like workaholism (Schaufeli, Taris, & Van Rhenen, 2008), job involvement, and organizational commitment (Hallberg & Schaufeli, 2006). Importantly, recent studies have indicated that engagement related positively to customer satisfaction (Salanova, Agut, & Peiró, 2005), in-role performance (Schaufeli, Taris, & Bakker, 2006b), and financial returns (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009).

Empirical studies have shown that job resources are important correlates of engagement (Mauno, Kinnunen, & Ruokolainen, 2007; Saks, 2006; see for a meta-analysis, Halbesleben, 2009), particularly under conditions of high job demands (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007). In addition, recent studies have demonstrated that several *personal* resources such as self-efficacy and organization-based self-esteem are related to work engagement (Mauno et al., 2007; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). However, most previous studies were cross-sectional or they focused only on a few types of resources. The central aim of the present longitudinal study was to investigate how various types of job and personal resources relate to work engagement over time. Using Conservation of Resources (COR) theory (Hobfoll,

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1989), we examined how engaged employees mobilize their own resources, and investigated whether job resources, personal resources, and work engagement are mutually related to each other.

1.1. Job resources, personal resources, and engagement

According to COR theory (Hobfoll, 1989), people seek to obtain, retain, and protect resources, and stress occurs when resources are threatened, or when individuals fail to gain resources after substantive resource investment. Thus, resources play a central motivational role in this theory. The current study focused on job resources (i.e. conditions) and personal resources.

Job resources are those physical, social, psychological and/or organizational aspects of the job that (a) are functional in achieving work goals, (b) reduce job demands and the associated physiological and psychological costs, and (c) stimulate personal growth and development (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Job resources may have both intrinsic motivational potential by facilitating learning or personal development and extrinsic motivational potential by providing instrumental help or specific information for goal achievement (Schaufeli & Bakker, 2004). As such, they induce employees to meet their goals. In turn, employees may become more committed and engaged in their job, because they derive fulfillment from it (Hackman & Oldham, 1980). Previous cross-sectional studies (Hakanen, Bakker, & Schaufeli, 2006; Saks, 2006; Xanthopoulou et al., 2007) have indeed shown that several job resources like autonomy, social support, supervisory coaching, performance feedback, and opportunities for professional development related positively to work engagement. These five types of job resources that have been recognized as crucial for the majority of occupations (Bakker & Demerouti, 2007; Lee & Ashforth, 1996) were examined in the present study.

Work engagement is determined by both environmental and individual factors (Hobfoll, 1989). Personal resources are positive self-evaluations that are linked to resiliency and refer to individuals' sense of their ability to control and impact upon their environment successfully (Hobfoll, Johnson, Ennis, & Jackson, 2003). As such, personal resources (a) are functional in achieving goals, (b) protect from threats and the associated physiological and psychological costs, and (c) stimulate personal growth and development. It has been shown that positive self-evaluations related strongly to various aspects of work-related well-being (e.g., job satisfaction; Judge, Van Vianen, & De Pater, 2004). The reason for this is that the higher the personal resources, the more positive individuals' self-regard. In turn, it is likely that individuals experience high levels of accordance between the goals they set and their capabilities (Judge, Bono, Erez, & Locke, 2005). Individuals with such goal self-concordance are intrinsically motivated to pursue their goals and as a result they trigger satisfaction (see also Luthans & Youssef, 2007).

We focused on three specific personal resources, namely self-efficacy, organizational-based self-esteem, and optimism. These resources both independently, as well as combined into a higher order construct, have been recognized as crucial for individuals' psychological well-being in general, and for work-related well-being in particular (Hobfoll, 2002; Luthans, Avolio, Walumbwa, & Li, 2005). Unlike personality traits (e.g., core self-evaluations; Judge, Bono, & Locke, 2000) that are stable and relatively fixed, these personal resources are malleable and open to change and development, and are thus considered most appropriate for the present study. Our conceptualization of personal resources parallels the concept of psychological capital developed by Luthans, Avey, Avolio, Norman, and Combs (2006). Psychological capital consists of four resources (i.e. optimism, efficacy, resiliency and hope), which are also considered to be susceptible to change (Luthans & Youssef, 2007).

Self-efficacy beliefs (i.e. individuals' perceptions of their ability to meet demands in a broad array of contexts; Chen, Gully, & Eden, 2001) contribute to motivation by influencing the challenges people pursue, the effort they spend, and their perseverance in the face of obstacles (Bandura, 1989). Self-efficacious employees have been found to experience higher levels of flow over time (Salanova, Bakker, & Llorens, 2006), while self-efficacious students reported higher levels of engagement (Llorens, Schaufeli, Bakker, & Salanova, 2007).

Further, Pierce and Gardner (2004) reviewed studies showing that Organizational-Based Self-Esteem (OBSE), namely the degree to which organizational members believe that they can satisfy their needs by participating in roles within the organization, is strongly related to job satisfaction and commitment. Additionally, in a recent longitudinal study among Finnish healthcare personnel, OBSE turned out to be one of the most important predictors of work engagement measured two years later (Mauno et al., 2007).

Similarly, optimism, which is the tendency to believe that one will generally experience good outcomes in life, is related to higher well-being levels (Scheier, Carver, & Bridges, 2001). Optimists are better able to confront with threatening situations because they adopt active coping strategies (Iwanaga, Yokoyama, & Seiwa, 2004), and as a result they adapt well at work (Luthans & Youssef, 2007).

On the basis of this literature, we formulated our first hypothesis:

Hypothesis 1. Time 1 job and personal resources relate positively to Time 2 work engagement.

1.2. Does work engagement lead to job and personal resources?

Recent studies suggested *reversed* relationships between (job and personal) resources and employee psychological well-being. For instance, De Lange, Taris, Kompier, Houtman, and Bongers (2005) found positive effects of mental health on supervisory support. Furthermore, Wong, Hui, and Law (1998) reported that job satisfaction related positively to several organi-

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zational resources (e.g., autonomy, skill variety, and feedback) assessed two years later. In a similar vein, Salanova et al. (2006), in their one-year follow-up study among Spanish teachers, found that work-related flow experiences associated with organizational resources and self-efficacy over time.

Taken together, these findings suggest that work engagement may facilitate the mobilization of external (job) and internal (personal) resources. This is consistent with Hobfoll's (1989, 2002) notion that in the absence of threats, people are motivated to create resources. Engaged employees, who are intrinsically motivated to fulfill their work objectives, will activate or create job resources (e.g., ask colleagues for help) to use as means to achieve these objectives. Furthermore, vigorous, dedicated and absorbed employees are more likely to fulfill their work goals (Schaufeli et al., 2006b). Consequently, this will generate their positive self-beliefs about their capabilities (i.e. self-efficacy), will make them feel more valuable (i.e. OBSE), and more optimistic. Similarly, Fredrickson (2003) proposes that positive affective states have the capability to broaden employees' momentary thought-action repertoires and build enduring personal, social and psychological resources. Work engagement, as a positive motivational-affective state, broadens by creating the urge to expand the self through learning and goal fulfillment, and as such builds resources. Hence, we formulated our second hypothesis:

Hypothesis 2. Time 1 work engagement relates positively to Time 2 job and personal resources.

1.3. Reciprocal relationships

As argued above, resources and engagement may relate reciprocally to each other. However, this is not the only hypothesis of reciprocity that may be derived from our theoretical analysis. According to COR theory (Hobfoll, 2002), resources evolve in caravans; namely, the existence of resources may bring additional resources in the long run. On the basis of this proposition, our final hypothesis suggested that job resources and personal resources may *also* relate reciprocally. When employees work in a resourceful job environment it is likely that they will feel more competent and valued. Simultaneously, self-efficacious or optimistic employees may perceive or build more resources as means to face demanding situations.

Job and personal resources are reciprocal, because individuals, through learning experiences, may form stronger positive evaluations about themselves and in turn, they comprehend or build more resourceful work environments (Kohn & Schooler, 1982). In other words, not only may personal resources be promoted by a meaningful, manageable and comprehensive environment (e.g., Luthans et al., 2006), but they may also determine the way people perceive or change this environment and how they react to it (Judge et al., 2000). Based on this rationale, we formulated our third and final hypothesis:

Hypothesis 3. Job resources, personal resources and work engagement relate reciprocally.

2. Methods

2.1. Procedure and participants

The present study was part of a broader project on employee well-being that took place in an electrical engineering and electronics company in The Netherlands. Employees from three divisions (Human Resources, Industry, Commercial and Economic Management) of the company were approached twice over the period of about two years. The average duration between the two measurements was $M = 18$ months ($SD = 2$; range 13–19 months). Companies in The Netherlands are periodically (e.g., bi-annually) required to conduct a psychosocial risk evaluation that includes an assessment of employee health and well-being. The present study was designed partly to satisfy this legal requirement, which explains the choice of the specific time interval. During the first measurement (T1) all employees from the three divisions ($N = 1121$) received an e-mail that explained the purpose of the project and requested that they participate. The anonymity of their answers was assured. In total, 540 employees (48% response) participated in T1. The same procedure was followed for the second measurement (T2), so again all employees ($N = 1016$) were invited to participate. The second time, 469 (46% response) questionnaires were returned. From those employees who participated at follow-up, 163 had also taken part in T1 (30% of all participants at T1 and 15% of the total sample at T1). In both measurements, questionnaires were distributed through the intranet of the company. Data of both waves were matched using a personal code that participants had to fill in at both occasions.

To control for potential selection bias due to panel loss, we examined whether employees from the panel group ($N = 163$) differed from the dropouts ($N = 377$) with respect to their baseline levels on the study variables. Results of multivariate analyses of variance showed that the two samples neither differed regarding their demographic characteristics (age: $F(1,538) = .47$, $p = .49$; gender: $F(1,538) = 3.28$, $p = .07$; education: $F(1,538) = .47$, $p = .49$; tenure: $F(1,538) = .01$, $p = .92$), nor regarding their mean scores on job resources ($F(1,538) = 2.68$, $p = .10$), personal resources ($F(1,538) = .17$, $p = .68$) and work engagement ($F(1,538) = .03$, $p = .86$), thus suggesting that no selection bias had occurred. The final study sample ($N = 163$) consisted of 131 men (80%) and 32 women (20%). Participants' mean age was 42 years ($SD = 8.9$) and their mean organizational tenure was 14 years ($SD = 10.5$). Most of the employees (96%) worked full-time. Finally, 34% of the employees held a college degree and 49% of the participants lived with their partners and had children.

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2.2. Measures

Job Resources. Autonomy was measured with a three-item scale developed by Bakker, Demerouti, and Verbeke (2004), based on Karasek's (1985) job content instrument (e.g., "Do you have control over how your work is carried out?"). *Social support* was measured with a three-item scale developed by Bakker et al. (2004), including "If necessary, can you ask your colleagues for help?". *Supervisory coaching* was measured with a five-item Dutch adaptation (Le Blanc, 1994) of Graen and Uhl-Bien's (1991) scale (e.g., "My supervisor uses his/her influence to help me solve my problems at work"). *Performance feedback* was measured with a three-item scale developed by Bakker, Demerouti, Taris, Schaufeli, and Schreurs's (2003; e.g., "I receive sufficient information about my work objectives"). Finally, *opportunities for professional development* were measured with three items from the scale constructed by Bakker, Demerouti, Taris, Schaufeli, and Schreurs (2003). An item is "My work offers me the possibility to learn new things". All job resources items were scored on a five-point scale, ranging from (1) "never" to (5) "always", except the opportunities for professional development items, where the scale ranged from (1) "totally disagree" to (5) "totally agree".

Personal resources. Self-efficacy was measured with the 10-item generalized self-efficacy scale (Schwarzer & Jerusalem, 1995; e.g., "I can always manage to solve difficult problems if I try hard enough"). Items were scored on a scale ranging from (1) "absolutely wrong" to (4) "absolutely right". *Organizational-Based Self-Esteem* was measured with the 10-item scale developed by Pierce, Gardner, Cummings, and Dunham (1989). An example item is: "I am important for the organization" (1 = totally disagree, 5 = totally agree). *Optimism* was measured with the Life Orientation Test – Revised (Scheier, Carver, & Bridges, 1994). This 10-item scale is comprised of six items that measure optimism and four filler items, which were excluded from the analyses. The four filler items where not included in T2. Out of the six main items, three are positive (e.g., "In uncertain times, I usually expect the best") and three are negative (e.g., "I hardly ever expect things to go my way") with answers ranging from (1) "totally disagree" to (5) "totally agree". All negative keyed items were recoded so that higher scores refer to higher optimism.

Work engagement was measured with the nine-item version of the Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2006a). The UWES reflects three underlying dimensions, which are measured with three items each: Vigor (e.g., "At my work, I feel bursting with energy"), Dedication (e.g., "My job inspires me"), and Absorption (e.g., "I get carried away when I am working"). High scores on all three dimensions indicate high work engagement. Items were scored on a scale ranging from (0) "never" to (6) "always".

2.3. Strategy of analysis

Our panel data were analyzed by means of structural equation modeling (SEM) techniques using the AMOS software package (Arbuckle, 2005). Before testing our hypotheses, we examined a series of measurement models to support the operationalization of the five job resources, the three personal resources, and the three work engagement components as underlying dimensions of an overall job resources factor, an overall personal resources factor, and an overall work engagement factor, respectively (see also Luthans, Avolio, Avey, & Norman, 2007). Specifically, we conducted item-level confirmatory factor analyses (CFA), as proposed by Gerbing and Anderson (1984). For the job resources factor we compared an uncorrelated, first-order CFA model (where the five job resources with their respective items were represented as independent constructs) with a second-order CFA model (where the items of each scale loaded on the respective underlying factor—e.g., the three autonomy items loaded on an autonomy factor, the five coaching items on a coaching factor, etc.- and then the five specific job resources loaded on an overall job resources factor). The analysis was conducted for the two measurement points separately. The same strategy was followed for personal resources and engagement. Results supported the representation of the five job resources in one overall job resources factor, since the second-order model showed an acceptable and significantly better fit than the first-order model (for T1: $\Delta\chi^2$ (6) = 245.87, $p < .001$; for T2: $\Delta\chi^2$ (6) = 270.47, $p < .001$). Similarly, analyses supported the representation of self-efficacy, OBSE and optimism in one overall personal resources factor (for T1: $\Delta\chi$ (3) = 39.12, $p < .001$; for T2: $\Delta\chi^2$ (3) = 65.53, $p < .001$), and the representation of vigor, dedication and absorption in one general work engagement factor (for T1: $\Delta\chi^2$ (4) = 226.68, $p < .001$; for T2: $\Delta\chi^2$ (4) = 205.63, $p < .001$). The output of these CFAs is available from the first author upon request.

Due to our relatively small sample size, we reduced the complexity of our hypothesized SEM models (i.e. the number of freely estimated parameters) without paying the price of losing information, by using manifest variables (Jöreskog & Sörbom, 1993). To use scores for our 'job resources', 'personal resources' and 'work engagement' manifest variables that encapsulate the factor loadings of their underlying dimensions, we calculated their weighted factor scores. Specifically, we conducted second-order principal axis factoring (PAF) analysis with varimax rotation on the five job resources, the three personal resources, and the three work engagement dimensions at both measurement times. The advantage of this method is that it takes into account the factor loadings of each sub-dimension, while calculating the factor score. PAF analyses resulted in one job resources factor (42% of explained variance at T1 and 41% at T2), one personal resources factor (32% of explained variance at T1 and 38% at T2), and one work engagement factor (68% of explained variance at both measurement times). Thus, the manifest 'job resources' variable represented the factor score of the five job resources scales, the manifest 'personal resources' variable represented the factor score of the three personal resources scales, and the manifest 'engagement' variable represented the factor score of the three work engagement subscales.

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To test the hypotheses, a number of competing models were fit to the data consecutively. Firstly, a model without cross-lagged paths but with autocorrelations and synchronous correlations (*stability model*; M1) was assessed. The autocorrelations were specified as correlations between the corresponding errors of each construct across the two measurement times, while synchronous correlations were specified as correlations between the errors of the constructs measured at the same time (cf. Pitts, West, & Tein, 1996; Salanova et al., 2006). The stability model was compared with three nested models representing each of the hypotheses. The second model (M2) was identical to the stability model but included additional structural paths from T1 job and personal resources to T2 work engagement. The third model (M3) was identical to the stability model but included additional paths from T1 work engagement to T2 job and personal resources. Finally, the reciprocal model (M4) included all paths of the previous models, as well as paths from T1 job resources to T2 personal resources, and from T1 personal resources to T2 job resources. The reciprocal model is shown in Fig. 1.

The fit of the nested models to the data was assessed with the chi-square (χ^2) statistic, the Goodness of Fit Index (GFI) and the Root Mean Square Error of Approximation (RMSEA). In addition, three fit indices were used that are less sensitive to sample size: the Comparative Fit Index (CFI), the Incremental Fit Index (IFI), and the Tucker–Lewis Index (TLI). For each of these statistics, values of .90 are acceptable and of .95 or higher are indicative of good fit (Hu & Bentler, 1999), except for the RMSEA for which values of .05 indicate good fit and values up to .08 represent reasonable errors of approximation (Browne & Cudeck, 1993). Similarly to previous studies that found relationships between demographic variables and personal resources (Luthans et al., 2007; Mäkikangas & Kinnunen, 2003), in our study gender related to T1 personal resources ($r = -.18$, $p < .05$; men reported slightly more personal resources), and education related to T1 ($r = .20$, $p < .01$) and T2 ($r = .21$, $p < .01$) personal resources (see Table 1). Therefore, we controlled for these effects in further analyses by adding only the significant paths in the structural model (see Fig. 1).

3. Results

3.1. Descriptive statistics

Table 1 presents means, standard deviations, Cronbach's alphas, and correlations among the study variables. Correlations among the five job resources, the three personal resources, and the three dimensions of work engagement are provided by the first author upon request. All constructs had satisfactory internal consistency at both measurement times (α's > .86). Furthermore, all correlations were in the expected direction, while the moderately high test–retest correlations (.47 < r < .70) indicate that participants' perceptions of job resources, personal resources and work engagement are relatively stable over time. Furthermore, there were no observed alpha changes since the mean levels of job resources ($t(324) = -.06$, $p = .55$), personal resources ($t(324) = -.07$, $p = .46$), and work engagement ($t(324) = .19$, $p = .85$) did not change significantly over time.

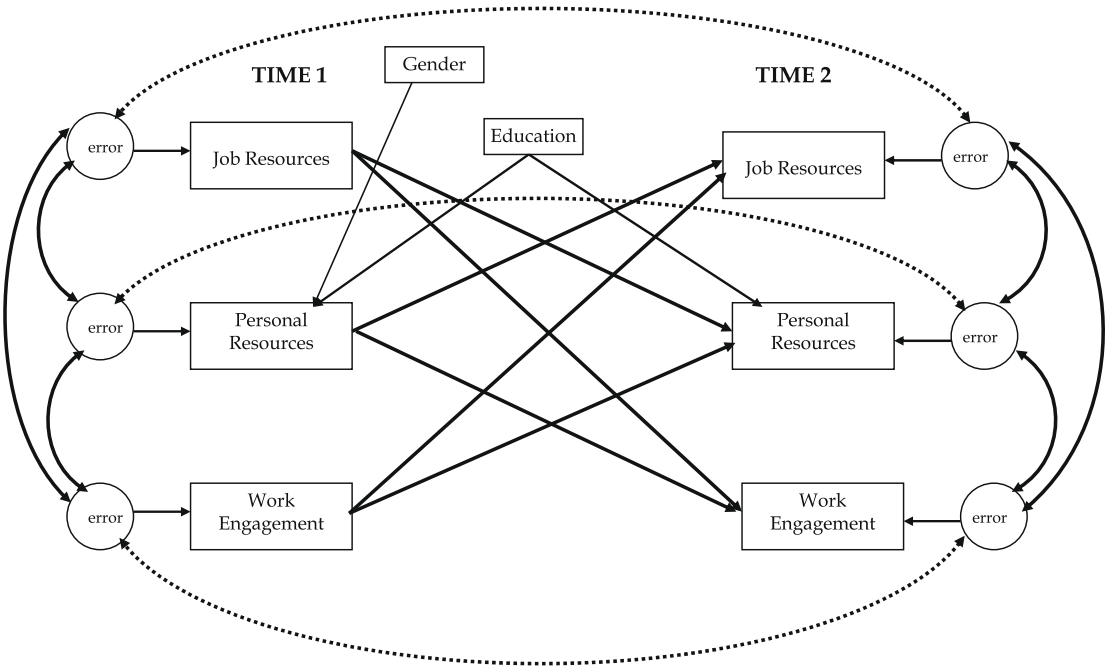

Fig. 1. The reciprocal model. Discontinuous lines indicate autocorrelations.

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Table 1
Means, standard deviations, Cronbach's Alphas (on the diagonal) and correlations among the study variables, $N = 163$.

		Mean	SD	1	2	3	4	5	6	7	8	9	10
1	Age	42.26	8.91		—								
2	Gender (1 = male; 2 = female)	1.20	.40	.00	—								
3	Education	3.90	1.23	−.23**	.02	—							
4	Organizational tenure	14.39	10.50	.77**	−.11	−.37**	—						
5	Job resources T1	3.35	.61	.15	−.03	−.04	.08	(.91)					
6	Job resources T2	3.39	.59	.01	−.03	−.03	−.03	.63**	(.91)				
7	Personal resources T1	3.52	.34	−.03	−.18*	.20**	−.09	.35**	.30**	(.86)			
8	Personal resources T2	3.55	.40	−.05	−.12	.21**	−.02	.31**	.38**	.47**	(.90)		
9	Work engagement T1	3.43	.97	.11	−.09	−.07	.09	.53**	.37**	.38**	.30**	(.92)	
10	Work engagement T2	3.41	.96	.10	−.13	−.08	.13	.41**	.50**	.34**	.54**	.70**	(.92)

Note. T1 = Time 1; T2 = Time 2.
* $p < .05$.
** $p < .01$.

3.2. Model testing

Table 2 displays the fit indices of the competing models, as well as the model comparisons. The stability model (M1) showed a bad fit to the data, while M2 and M3 showed a marginally acceptable fit with most indices satisfying their criteria. The reciprocal model (M4) was the only model with a very good fit to the data, since all fit indices were higher than .95 and the RMSEA was lower than .05. Most importantly, the χ^2 difference tests showed that both M2 and M3 were superior to M1, suggesting that the inclusion of paths either from job and personal resources to work engagement (M2) or from work engagement to job and personal resources (M3) is substantial. However, Table 2 also shows that M4 fit significantly better than M1, M2, and M3. This indicates that the model that includes reciprocal relationships among job resources, personal resources, and work engagement explains best the data.

Autocorrelations for job resources ranged from .42 to .47, for personal resources from .19 to .28, and for work engagement ranged from .45 to .59, across the competing models. According to Hypothesis 1, job and personal resources related positively to work engagement over time. M2 assessed this hypothesis and showed that, indeed, T1 job resources ($\gamma = .19$, $p < .01$) and T1 personal resources ($\gamma = .18$, $p < .01$) had unique effects on T2 work engagement. Thus, Hypothesis 1 was supported. Hypothesis 2, which stated that work engagement has positive effects on job *and* personal resources over time, was also supported. M3 tested this hypothesis and showed that T1 work engagement related to T2 job resources ($\gamma = .26$, $p < .001$) and T2 personal resources ($\gamma = .23$, $p < .001$).

Strong support was found for Hypothesis 3 regarding reciprocal relationships between job resources, personal resources, and work engagement. Not only was M4 the best fitting model to the data (Table 2), but also all hypothesized effects were significant and in the expected direction. The findings show that T1 job and personal resources related to T2 work engagement and that T1 work engagement related to T2 job and personal resources. Additionally, T1 job resources associated with T2 personal resources and the other way around. Table 3 presents the path coefficients of the reciprocal model, as well as the critical ratios for differences between paths. Critical ratios for differences test whether two estimates differ significantly in terms of their magnitude, and thus indicate whether certain effects are stronger than others. The non-significant findings of the critical ratios for difference tests (Table 3) suggest that (1) job and personal resources were equally strong correlates of work engagement *and* of each other, (2) work engagement related to job resources as strongly as job resources to work engagement, and (3) personal resources related to work engagement equally strong as work engagement to personal resources. M4 explained 16% of variance in T2 job resources, 20% of variance in T2 personal resources, and 21% of variance in T2 work engagement.

Table 2
Goodness-of-fit indices of the competing models, $N = 163$.

Model	χ^2	*df*	*p*	GFI	RMSEA	CFI	IFI	TLI	Comparison	$\Delta\chi^2$	Δ *df*
M1. Stability model	68.88	16	.000	.90	.14	.87	.87	.77	—	—	—
M2. JRT1/PRT1 → WET2	52.00	14	.000	.92	.13	.90	.90	.81	M1–M2	16.88*	2
M3. WET1 → JRT2/PRT2	48.48	14	.000	.93	.12	.91	.91	.83	M1–M3	20.40*	2
M4. Reciprocal model:	6.60	10	.762	.99	.01	1.00	1.00	1.00	M1–M4	62.28*	6
JRT1/PRT1 → WET2,									M2-M4	45.40*	4
WET1 → JRT2/PRT2,									M3-M4	41.88*	4
JRT1 → PRT2&PRT1→ JRT2											
Null model	422.84	28	–	.56	.30	–	–	–	–	–	–

Note. JR = job resources; PR = personal resources; WE = work engagement; T1 = Time 1; T2 = Time 2; GFI = goodness-of-fit index; RMSEA = root mean square error of approximation; CFI = comparative fit index; IFI = incremental fit index; TLI = Tucker–Lewis index.
* $p < .001$.

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Table 3
Reciprocal model: standardized path coefficients and critical rations for differences, $N = 163$.

	Criterion variables						Critical ratios for differences
	JR T1	JR T2	PR T1	PR T2	WE T1	WE T2	
Control variables							
Gender	–	–	−.12*	–	–	–	
Education	–	–	.22***	.27***	–	–	a–b:$z = 0.04$
Predictor variables							c–d:$z = -0.85$
JR T1	–			.21*(a)		.33***(c)	e–f:$z = -1.17$
PRT1		.18*(b)	–			.22**(d)	e–c:$z = -0.73$
WE T1		.30***(e)		.22**(f)			f–d:$z = -0.67$

Note. JR = job resources; PR = personal resources; WE = work engagement; T1 = Time 1; T2 = Time 2.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

4. Discussion

The main purpose of the present longitudinal study was to investigate long-term relationships between job resources, personal resources, and work engagement. Based on the main assumptions of Hobfoll's (1989, 2002) COR theory, it was hypothesized that job resources, personal resources, and work engagement are reciprocal. Compared to alternative models, the model including reciprocal relationships among resources and work engagement received the strongest empirical support. The findings clearly indicate that the relationships between different types of resources and work engagement are best explained when all potential effects are simultaneously taken into account. In addition, the current study shows that job and personal resources relate reciprocally.

4.1. Unique effects

The present findings replicate and expand previous studies (Hakanen et al., 2006; Mauno et al., 2007; Schaufeli & Bakker, 2004) on the role of job resources as main correlates of work engagement. The results show that employees who experience autonomy at work, have supportive colleagues, receive proper coaching and high-quality feedback, and have opportunities for professional development possess the instrumental means and are intrinsically motivated to achieve their work goals (Bakker & Demerouti, 2007). Therefore, they are more likely to be vigorous, dedicated, and absorbed in their work tasks over the course of time (Schaufeli & Bakker, 2004). This result may also be explained by social exchange theory (Cropanzano & Mitchell, 2005). One of the basic tenets of this theory is that advantageous and fair social exchanges lead to strong relationships that produce effective work behaviors and positive employee attitudes. Most importantly, social exchange relationships involve a series of interactions that generate unspecified obligations. In this context, Saks (2006) suggested that one way for employees to repay their organization for the resources they receive is through their levels of engagement. Accordingly, when employees are autonomous, receive support, and have opportunities for development, they are likely to reciprocate by showing higher levels of engagement.

Personal resources seem to play an equally crucial role as job resources in explaining work engagement (Llorens et al., 2007; Xanthopoulou et al., 2007). The empirical evidence of the positive relationship between personal resources and work engagement across time supports those theories that acknowledge personal resources or core self-evaluations as crucial determinants of employee well-being (Judge et al., 2005). Results suggest that employees who are self-efficacious, optimistic and believe that are important for the organization are most likely to experience high levels of work engagement. Further, the present findings emphasize the involvement of the self as a prerequisite for the experience of engagement, an assumption that is in line with several conceptual definitions of work engagement (for a review, Macey & Schneider, 2008), including the one adopted in the present study.

Additionally, the results of the present study show that work engagement related to both job and personal resources over time. This finding is in line with Fredrickson's (2003) Broaden- and Build theory by demonstrating that employees who are in a positive affective state (i.e. work engagement) may build personal (i.e. self-efficacy, OBSE, optimism) and psychosocial (i.e. job) resources. Apparently, engaged employees do not only feel good about themselves, but also they are best able to mobilize support from colleagues, receive feedback, and to create opportunities at work.

4.2. Cycles

Importantly, the current study clearly indicates that none of the supported relationships can be considered in isolation. In other words, job resources, personal resources, and work engagement cannot be labeled solely as hypothetical antecedents or outcomes of the psychological processes under study. Rather, these psychological processes are dynamic. The strong empirical evidence regarding reciprocity suggests that job and personal resources are mutually related with work engage-

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ment, and also with each other. This prominent dynamic relationship supports the assumption of COR theory (Hobfoll, 2002) that resources and well-being act in cycles. When job resources are available for employees, they feel more able in dealing with their work goals (i.e. they have personal resources). Similarly, employees who feel self-efficacious, valuable and optimistic (i.e. they have high levels of personal resources) may create a resourceful work environment. In both cases, it is likely that these employees will end up engaged in their work tasks. When employees experience work engagement, they tend to easily recognize, activate or create resources.

The finding that job and personal resources are reciprocal across time is in line with the learning-generalization model of Kohn and Schooler (1982), according to which individuals tend to generalize their work-related learning experiences to their off-job situation, and vice versa. Thus, it is argued that over time, individuals, through learning experiences, form stronger positive beliefs about themselves and comprehend or create resourceful work environments. Furthermore, job and personal resources are equally strong correlates of each other and of work engagement. This finding provides a straightforward answer to the ongoing discussion regarding the sequence of effects in explaining work-related well-being. On the on hand, work psychological models have established the role of work characteristics as the main initiators of the process that leads to employee wellness (Bakker & Demerouti, 2007). Other scholars suggest that self-evaluations are the most crucial antecedents of employee well-being, which may also determine the perception of the work environment (Judge et al., 2004, 2005). The present study clearly implies that the discussion about the most prominent *sequence* of effects is not of main importance since effects are cyclical. Instead, the crucial issue is to explain how and why the factors constituting this cycle reinforce one another.

Although our findings provide substantial support for COR theory (Hobfoll, 1989, 2002), it is crucial to note that there was no significant *increase* in the levels of resources and engagement over time. Therefore, even though our study supports the idea of cycles, it does not suggest that these are also, level-wise, *gain* cycles or spirals. Namely, it cannot be deduced from our study that the occurrence of resources or engagement leads to higher levels of resources or engagement. Such a hypothesis may be tested if the study design includes a systematic intervention regarding the promotion of resources and engagement after T1, or by using more than two waves of data collection. However, this does not downgrade the importance of the present study, which supports that resources and engagement may *activate* and *conserve* positive conditions, beliefs and affective states. This conclusion is substantial for theory because it outlines underlying psychological mechanisms, and for practice since it implies that resourceful environments and workforces flourish over time.

4.3. Limitations and future studies

Despite obtaining interesting results, the present study has certain limitations. Although the longitudinal design allows time interval among hypothesized predictors and outcomes, strictly speaking, it does not allow conclusions about causality. For instance, an effect of Time 1 predictor on Time 2 outcome might also be due to the influence of an unmeasured third variable. Nevertheless, our results provide evidence that job resources, personal resources, and work engagement are reciprocal, since they do not contradict such an explanation.

A second limitation is that observations were based solely on self-reports, which might have inflated the relationships among the variables. Again, the longitudinal design overcomes some of the problems of common method variance and unmeasured third variables, because previous levels of the variables are controlled for to a degree. Also, Harman's single-factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) resulted in the expected three factors (50% of explained variance at T1 and 52% at T2) with the first factor (i.e. job resources) accounting only for 20% of the variance at T1 and 21% at T2. This empirical evidence together with the consistency of the present findings with theory and previous research supports that mono-method bias is not a major drawback of this study. We should also keep in mind that job incumbents are the most important source of information regarding their job conditions and beliefs (Mäkikangas, Kinnunen, & Feldt, 2004), and that other-ratings can also be problematic due to stereotyping and the halo effect (Kerlinger & Lee, 2000). In spire of that, it would be interesting for future studies to incorporate additional objective ratings, particularly when it comes to job resources (Bakker & Demerouti, 2007).

Another limitation of the present study is that it is based on a small number of employees working in one single organization, which limits the generalizability of our results. However, note that the sample was not strictly homogeneous since participants were working in three different divisions, and had various job positions and tasks. Furthermore, the current study was mainly interested in psychological processes and not in comparisons of groups, where the use of representative samples is of crucial importance. Nevertheless, future studies should try to replicate results to other occupations. Next, although the longitudinal character of the study is an obvious advantage, the choice of the specific time interval was based on pragmatic rather than theoretical reasons. Although pragmatic, the two-year time lag applied in the study is in line with the study of Dormann and Zapf (2002) regarding the appropriateness of time lags in longitudinal studies. These authors suggested that time lags of at least two years are required to demonstrate effects between work characteristics and well-being.

Notwithstanding these limitations, the present findings advance our knowledge on the dynamic relationships among job resources, personal resources, and work engagement and as such have certain practical implications. The main message for organizations is that job and personal resources lead to engaged workforces, who seem able to mobilize additional resources. Therefore, organizations should focus on creating resourceful work environments and on training programs that enhance employees' positive self-beliefs.

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