

A cross-national study of work engagement as a mediator between job resources and proactive behaviour

M. Salanova^{a*} and W.B. Schaufeli^b

^a*Universitat Jaume I, Castellón, Spain;* ^b*Utrecht University, Utrecht, the Netherlands*

This study investigates the mediating role of work engagement (i.e. vigour and dedication) among job resources (i.e. job control, feedback and variety) and proactive behaviour at work. This mediating role was investigated, using Structural Equation Modelling in two independent samples from Spain (n = 386 technology employees) and the Netherlands (n = 338 telecom managers). Results in both samples confirmed that work engagement fully mediates the impact of job resources on proactive behaviour. Subsequent multigroup analyses revealed that the strengths of the structural paths of the mediation model were invariant across both national samples, underscoring the cross-national validity of the model

Keywords: job resources; work engagement; proactive behaviour; cross-national study

Introduction

The current labour market is characterized by flexibility, rapid innovation and continuous changes, and organizations are therefore looking for specific competencies and behaviours in employees that facilitate adaptation to these new labour requirements. Proactive behaviour is one of these specific behaviours and it is defined as ‘taking initiative in improving current circumstances or creating new ones... Employees can engage in proactive activities as part of their in-role behaviour in which they fulfil basic job requirement Extra-role behaviours can also be proactive, such as efforts to redefine one’s role in the organization’ (Crant 2000, p. 436).

Although there is reasonable agreement about the salience of active rather than passive behaviours in proactive work behaviour (Ashford and Cummings 1983, 1985; Bateman and Crant 1993), there is no agreement on the operationalization of proactive behaviour. Some researchers consider proactivity as a personal disposition akin to personality (Bateman and Crant 1993; Parker 2000), whereas others focus on its contextual factors, considering proactive behaviour as a function of situational cues (Morrison and Phelps 1999). This article follows the latter view and considers proactive behaviour in terms of personal initiative (Frese, Fay, Hilburger, Leng and Tag 1997), which is a behavioural pattern whereby the individual takes an active self-starting approach to work, thereby going beyond formal job requirements. Proactive employees show personal initiative and are action-directed, goal-directed, seek new challenges, and are persistent in the face of obstacles.

The aim of the current study is to show that job resources (i.e. situational cues) have an indirect impact on proactivity through work engagement, which is considered

*Corresponding author. Email: Marisa.Salanova@uji.es

to be an indicator of intrinsic work motivation. Hence, our study seeks to uncover the (intrinsic) motivational underpinnings of proactive employee behaviours.

Job resources and motivation

According to Crant's (2000) integrative framework of the antecedents and consequences of proactive behaviour, two broad categories of antecedents can be identified: contextual (i.e. job resources such as job control, feedback, and variety) and individual factors (i.e. intrinsic motivation). It appears that both factors are related since challenging and enriched jobs, in which employees can draw upon many resources, generate high levels of intrinsic motivation, which *in turn* spurs proactive work behaviour (Parker 2000). In a similar vein, Frese and Fay (2001) present a comprehensive model of antecedents and consequences of personal initiative in which, among others, job control, job complexity and support are considered to be 'environmental supports' that enhance employees' levels of personal initiative. They argue that these environmental supports, along with personality factors such as achievement motivation and action orientation, positively influence levels of personal initiative through increased motivation and skill development.

Finally, on a more general level, it was found that job resources are related to intrinsic work motivation (Janssen, De Jonge and Bakker 1999; Houkes, Janssen, De Jonge and Nijhuis 2001). In a similar vein, Demerouti, Bakker, Nachreiner and Schaufeli (2001) successfully tested the so-called Job Demand-Resources (JD-R) model in a German sample. The JD-R model posits that job demands (i.e. physical demands, time pressure, shift work) are associated with exhaustion, whereas lacking job resources (i.e. performance feedback, job control, participation in decision making, social support) are associated with disengagement. Recently, Schaufeli and Bakker (2004) also tested the JD-R model in the Netherlands but instead of disengagement as a dimension of burnout, they included 'work engagement' (see below). Their results, later replicated in a Finnish sample (Hakanen, Bakker and Schaufeli 2006), showed that the availability of job resources functions as an antecedent of a motivational process that, via work engagement, results in greater organizational commitment. Hence, the absence of job resources fosters disengagement, whereas the presence of job resources stimulates personal development and increases work engagement. Furthermore, recent research shows that engagement has a positive impact on performance in different contexts such as: academic performance (Schaufeli, Martínez and Marqués-Pinto 2002a); group performance (Salanova, Llorens, Cifre, Martínez and Schaufeli 2003) and quality of service of customer's contact employees (Salanova, Agut and Peiró 2005a).

Work engagement as intrinsic motivation

The fact that job resources have motivational potential signifies that work fulfills basic human needs for employees, such as the needs for autonomy (deCharms 1968), competence (White 1959) and relatedness (Baumeister and Leary 1995). According to self-determination theory (Deci and Ryan 1985), work contexts that support psychological autonomy, competence and relatedness enhance intrinsic motivation and increase well-being (Ryan and Frederick 1997). For instance, proper feedback fosters learning thereby increasing job competence, whereas decision latitude satisfies the need for autonomy. This intrinsic motivational potential of job resources is also recognized by more traditional theories, such as Job Characteristics Theory (JCT) (Hackman and Oldham 1980). According to JCT, every job has a specific motivational potential that depends on the presence of five

core job characteristics: skill variety, task identity, task significance, autonomy and feedback. Furthermore, JCT hypothesizes that these job characteristics are linked – through so-called critical psychological states – with positive outcomes such as high quality work performance, job satisfaction, low absenteeism and low staff turnover. On balance, previous empirical findings agree with Hackman and Oldham's model (Hackman and Oldham 1980).

In the current study we use work engagement as an indicator of intrinsic motivation at work. Work engagement is defined as a 'positive, fulfilling, work-related state of mind that is characterised by vigor, dedication, and absorption' (Schaufeli, Salanova, González–Romá and Bakker 2002b, p. 74). Rather than a momentary and specific state, such as an emotion, engagement refers to a more persistent affective-motivational state that is not focused on any particular object, event or behaviour. *Vigour* is characterized by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. *Dedication* is characterized by a sense of significance, enthusiasm, inspiration, pride and challenge. Basically, dedication refers to a particularly strong psychological identification with one's job. The final dimension of engagement, *absorption*, is characterized by being fully concentrated and engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work. However, mounting evidence suggests that absorption – which is akin to the concept of flow (Csikszentmihalyi 1990) – should be considered a consequence of work engagement, rather than one of its components (Salanova et al. 2003). In contrast, vigour and dedication are considered the core dimensions of engagement that are the direct opposites of the burnout dimensions, exhaustion and cynicism respectively, that constitute the 'core of burnout' (Green, Walkey and Taylor 1991, p. 463).

Therefore, in the present study, vigour and dedication are used as indicators of work engagement. This agrees with the way that motivation is usually considered, namely as a psychological process that includes activation or energy, effort or persistence, as well as the direction towards a goal (Campbell and Pritchard 1976; Naylor, Pritchard and Ilgen 1980; Katzell and Thompson 1990; Locke and Latham 1990). Since vigour reflects activation and energy, effort and persistence of the motivated behaviour, as well as goal-directness in terms of concentration on a specific work goal, it is considered a motivational concept. However, the concept of vigour is rather generic and may apply to intrinsically as well as extrinsically motivated behaviour. The second dimension of work engagement – dedication – is more clearly related to the intrinsic nature of motivation as defined by Warr, Cook and Wall (1979) as the degree to which a person wants to work well in his or her job in order to achieve personal satisfaction. By definition, intrinsic motivation is concerned with the task content; with the job activity in itself, and with the fulfilment of personal needs such as autonomy or learning. In this sense, dedication refers to enthusiasm, feeling proud because of the work done, being inspired by one's job, and feeling that one's work is full of meaning and purpose. In fact, dedication refers to satisfying higher order needs such as the need for competence or the need of control (Bandura 1986; Kanfer 1990).

It follows from the reasoning above that work engagement covers the basic dimensions of intrinsic motivation, which ensures goal oriented behaviour and persistence in attaining objectives along with high levels of activation (i.e. vigour) as well as feeling enthusiastic, identifying with and being and proud of one's job (i.e. dedication). Since work engagement refers to high levels of energy, persistence, identification and goal-directness, it can be expected that high levels of engagement increase proactive work behaviour in the sense of personal initiative.

The current study

It is our intention to contribute to the ongoing discussion about the (intrinsic) motivational potential of job resources by showing that they have an indirect impact on employee proactivity through work engagement. More specifically, this article deals with exploring the role of work engagement, as a mediating variable, between job resources such as job control, feedback, and job variety on the one hand, and proactive behaviour on the other hand. These specific job resources were included because previous research (e.g. Frese et al. 1996) demonstrated that these are relevant environmental supports for proactive behaviour and personal initiative at work. For instance, job control stimulates initiative as it has an impact on employee's motivation to redefine their tasks in a broader way (thus including extra role goals) and on their sense of responsibility for their job. However, previous research did not uncover the process that mediates the relationship between job resources and proactive behaviour. Our study is designed to fill this gap by assuming that work engagement as an indicator of intrinsic motivation plays a key mediation role. Specifically, we hypothesize (see Figure 1) that:

Hypothesis 1: Job resources are associated with high levels of work engagement.

That is, favourable job characteristics foster high levels of energy and persistence in the face of obstacles (i.e. vigour), as well as the fulfilment of personal needs and identification with the job (i.e. dedication).

Hypothesis 2: In its turn, work engagement is positively associated with proactive behaviour, thus playing a full mediating role between job resources and proactive behaviour (see Figure 1).

We will test this mediating role of work engagement in two independent samples of employees from Spain and the Netherlands, using the same psychological constructs with slightly different measures in each sample, in order to show the robustness of the research model.

This leads to:

Hypothesis 3: The proposed full mediation model will be invariant across both national samples.

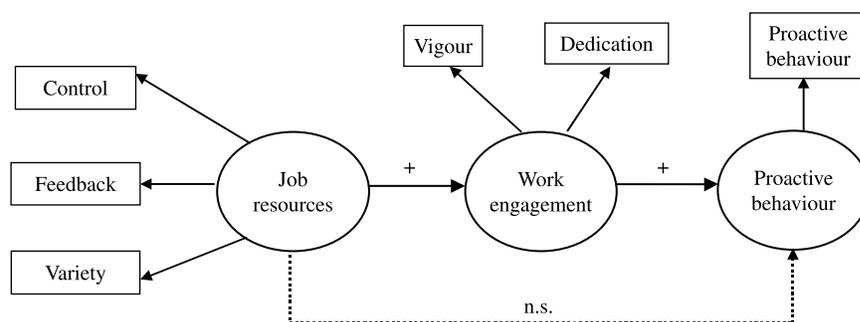


Figure 1. The research model.

Method

Samples and procedure

We used two samples in order to test our hypotheses. Both samples contain employees who are dealing with changes and innovations at work. They work in innovative and rapidly changing jobs that require continuous adaptation so that proactive behaviour plays a relevant role. The first sample is composed of Spanish employees working with new Information and Communication Technologies (ICT) who have to adapt to rapid technological changes. The second sample is composed of managers from a large Dutch telecom company that was going through a privatization process so that its managers have to adapt to a highly competitive and dynamic business and consumer market. So, also for them, proactive behaviour is important in order to adapt successfully to their work role.

Sample 1. A questionnaire was distributed in a sample of 800 employees from public and private Spanish organizations from different occupational sectors (i.e. tile industry, public administration and health care). A total of 624 employees returned the questionnaire (response rate = 78%), from which 524 used ICT in their jobs, and 386 used ICTs at least 50% or more of their work time. The latter group was selected to be included in the current study.

Most employees used Enterprise Integrating Networks (EIN) (82%) such as computing tools (i.e. word and data processors) and communications tools (i.e. internet). The remaining 18% used Advanced Manufacturing Technology (AMT), such as Computer-Aided Design (CAD) and Computer Numerical Control. These employees were working in various jobs and occupational fields, such as clerical jobs (37%), technical and support staff (30%), sales (6%), human services (8%), management (7%), laboratory settings (7%), and as operators (5%). Finally, 199 are woman (52%) and 187 men (48%). The mean of age was 30 years (SD = 7.9) ranging from 20 to 59 years.

Subjects were asked to answer a set of self-report questionnaires. Risk prevention experts or personnel from Human Resources Departments distributed the questionnaires, which were delivered in an envelope. A covering letter explained the purpose of the study, that participation was voluntary, and guaranteed confidentiality. Respondents were asked to return the completed questionnaires in a sealed envelope, either to the person who had distributed them or directly to the research team.

Sample 2. A questionnaire was distributed in a sample of 420 managers from a large Dutch telecom company. This questionnaire was part of a voluntary, bi-annual physical and psychosocial check-up programme that was carried out by an Occupational Health and Safety Service. A booklet, including the scales used in the current study, was sent by surface mail to the home addresses of the managers and a total of 338 returned the booklet using a pre-stamped envelope (response rate 80%). The majority are men (91%); 94% live together with a partner; 57% hold at least a college degree; 35% completed a vocational training programme, and 8% visited high school. The mean age is 43 years (SD = 7.9) and, on average, the managers worked 18.4 years for the company (SD = 10.7). Thus, we deal with is a typical managerial sample consisting of predominantly highly educated, experienced, middle-aged males, living with a partner.

Instruments

Job resources

Three types of job resources were assessed in each sample, i.e. job control, feedback and task variety. These concepts were operationalized slightly differently in both samples.

1. Job control

Sample 1: Task control and timing control were used as comprehensive and specific indicators of job control specially indicated for work with new technologies (Jackson, Wall, Martin and Davis 1993). The scale included five items; example items are: 'I have the discretion to decide what tasks I will do at my workday' (task control), 'I have the discretion to decide when to start a task' (timing control). Participants responded on a 5-point scale which ranged from 1 (not at all) to 5 (a great deal). The internal consistence (Cronbach's α) was .89.

Sample 2: A brief three-item version of the autonomy scale of the Dutch Questionnaire on the Experience and Evaluation of Work (Van Veldhoven and Meijman 1994; Van Veldhoven et al. 2002) was used to assess job control (e.g. 'Can you decide how to carry out your tasks'). Participants responded on a 5-point scale which ranged from 1 (never) to 5 (always). The internal consistence (Cronbach's α) was .78.

2. Feedback

Sample 1: Feedback was measured with the 4-items scale of Hackman and Oldham (1975). This scale assesses feedback from the job itself (e.g., 'Doing the job itself provides me with information about my work performance'), as well as feedback from others (e.g., 'The supervisors and co-workers on this job almost never give me any feedback about how well I am doing in my job' (reversed). Participants responded on a 7-point scale that ranged from 1 (totally disagree) to 7 (totally agree). Cronbach's $\alpha = .65$.

Sample 2: A brief 3-item version of the feedback scale of the Dutch Questionnaire on the Experience and Evaluation of Work (Van Veldhoven and Meijman 1994; Van Veldhoven et al. 2002) was used (e.g. 'I receive sufficient information about the results of my work'). Participants responded on a 5-point scale which ranged from 1 (never) to 5 (always). The internal consistence (Cronbach's α) was .83.

3. Task variety

Sample 1: Variety was measured with a 3-item self-constructed scale that assesses the degree to which the job includes different kinds of tasks, activities and duties (e.g., 'My job is varied'). Participants responded on a 5-point scale that ranged from 1 (not at all) to 5 (in great deal). Cronbach's $\alpha = .75$.

Sample 2: The 6-item task variety scale of the Dutch Questionnaire on the Experience and Evaluation of Work (VBBA; Van Veldhoven and Meijman 1994; Van Veldhoven, de Jonge, Broersen, Kompier and Meijman 2002) was used (e.g. 'Do you need creativity in your job?'). Participants responded on a 5-point scale which ranged from 1 (never) to 5 (always). Cronbach's $\alpha = .80$.

Work engagement was assessed in both samples with the Utrecht Work Engagement Scale (UWES; Schaufeli et al. 2002b), including:

1. Vigour (VI) (5 items; e.g. 'At my work, I feel bursting with energy'). Cronbach's $\alpha = .76$ in Spain and .81 in the Netherlands.
2. Dedication (DE) (5 items; e.g. 'My job inspires me'). Cronbach's $\alpha = .88$ in Spain and .91 in the Netherlands. Participants responded on a 7-point scale that ranged from 1 (never) to 7 (always).

Previous research among university students suggested cross-national validity of the UWES across Spain, the Netherlands and Portugal (Schaufeli et al. 2002a).

Proactive behaviour

Sample 1: A self-constructed three-item scale was used referring to employee's behaviour in a changing technological environment. Participants responded on a 5-point scale that ranged from 1 (never) to 5 (always) how they managed with organizational changes: During technological changes in my company: (1) 'After attaining a goal, I look for another, even more challenging goal'; (2) 'When things are wrong, I search for a solution immediately', and (3) 'I take risks because I feel fascinated because of the challenges of the job' (Cronbach's $\alpha = .71$).

Sample 2: The seven-item 'personal initiative' scale as developed by Frese et al. (1997) was used to assess proactivity. An example item is 'Whenever something goes wrong, I search for a solution immediately'. The personal initiative scale is available in Dutch, German and English (Fay 1998). Participants responded on a 5-point scale which ranged from 1 (never) to 5 (always) (Cronbach's $\alpha = .80$).

Data analyses

Structural Equation Modelling (SEM) methods as implemented by the AMOS program (Arbuckle and Wothke 1999) were used to test three competitive models: the full research mediating model (M1), the partial mediating model (M2), and an alternative model (M3) that assumes that proactive behaviour is mediating between job resources and engagement. Before performing SEM, the frequency distributions of the scales were checked for normality and multivariate outliers were removed. First, M1, M2 and M3 were tested in each sample separately (Spain and the Netherlands) and next a multiple group analyses (Byrne 2001, pp. 173–199) was performed in order to assess invariance across both national samples.

Fit indices: maximum likelihood estimation methods were used and the input for each analysis was the covariance matrix of the items. The goodness-of-fit of the models was evaluated using absolute and relative indices. The absolute goodness-of-fit indices calculated were (cf. Jöreskog and Sörbom 1986): (1) the χ^2 goodness-of-fit statistic; (2) the Root Mean Square Error of Approximation (RMSEA); (3) the Goodness of Fit Index (GFI); (4) the Adjusted Goodness of Fit Index (AGFI). Non-significant values of χ^2 indicate that the hypothesized model fits the data. However, χ^2 is sensitive to sample size, so that the probability of rejecting a hypothesized model increases when sample size increases. To overcome this problem, the computation of relative goodness-of-fit indices is strongly recommended (Bentler 1990). Values of RMSEA smaller than .08 indicate an acceptable fit and values greater than 0.1 should lead to model rejection (Cudeck and Browne 1993). In contrast, the distribution of the GFI and the AGFI is unknown, so that no statistical test or critical value is available (Jöreskog and Sörbom 1986).

The relative goodness-of-fit indices computed were (cf. Marsh, Balla and Hau 1996): (1) Non-Normed Fit Index (NNFI) – also called the Tucker Lewis Index; (2) Incremental Fit Index (IFI); (3) Comparative Fit Index (CFI). The latter is a population measure of model misspecification that is particularly recommended for model comparison purposes (Goffin 1993). For all three relative-fit indices, as a rule of thumb, values greater than .90 are considered as indicating a good fit (Hoyle 1995).

Results

Descriptive analyses

First, descriptive analyses were performed and internal consistencies were computed for the six scales in each sample separately (see Table 1). With one exception, feedback in the

Table 1. Means (M), standard deviations (SD), correlations (r) and internal consistencies (Cronbach's α) of the study variables) in the Spanish (n = 386) and the Dutch sample (n = 338).

	Spain		NL		1	2	3	4	5	6
	M	SD	M	SD						
1. Control	3.51	0.99	3.94	.56	(.89/.78)	.33***	.57***	.37***	.48***	.31***
2. Feedback	4.65	.93	3.83	.72	.18***	(.65/.83)	.49***	.39***	.45***	.23***
3. Variety	3.88	.62	3.60	.75	.23***	.09#	(.75/.80)	.38***	.58***	.28***
4. Vigour	4.01	.99	4.25	.73	.12*	.17***	.20***	(.76/.81)	.72***	.58***
5. Dedication	3.65	1.24	4.38	.87	.22***	.28***	.37***	.61***	(.88/.91)	.40***
6. Proactive B.	3.68	.80	3.73	.54	.08	.16***	.15**	.38***	.47***	(.71/.80)

Notes. Correlations for the Dutch employees below the diagonal. Cronbach's α for Spanish/Dutch sample on the diagonal. * p < .05; ** p < .01; *** p < .001.

Spanish sample, values of α meet the criterion of .70 (Nunnally and Bernstein 1994). Since the α -value for feedback approaches the critical value of .70 it is considered sufficient as well. As can be seen from Table 1, in both samples, job control, feedback and variety are positively related to both engagement dimensions, as well as to proactive behaviour. Except for the correlation between variety and feedback ($r = 0.09$; $p = 0.06$), and between control and proactive behaviour ($r = 0.08$; $p = 0.09$) in the Spanish sample, all correlations are significant. Specifically, the interrelations among both engagement dimensions are rather strong, thus confirming the assumption that they refer to the same underlying motivational construct. Finally, the fact that the correlations in both samples between job resources (i.e. job control, feedback and variety) and engagement (i.e. vigour and dedication) are significant seems to agree with hypothesis 1.

Testing the research model

According to Baron and Kenny (1986) and Judd and Kenny (1981), when a mediational model involves latent constructs, structural equation modelling is to be preferred as data analysis strategy. In order to test hypothesis 2 about the mediating role of engagement, we fitted our research model (M1), as depicted in Figure 1, to the data of both samples separately. We did so in four consecutive iterations as proposed by the authors mentioned above. Three latent variables were used in our model. (1) 'Job resources' included three indicators (i.e. job control, feedback and variety), (2) 'Engagement' included two indicators (i.e. vigour and dedication), and (3) 'Proactive behaviour' included a single indicator (the average total score of the corresponding scale) which incorporates information on the reliability of the scale (i.e. the error variance was estimated by using the formula $((1-\alpha) * \sigma^2)$).

Results, as depicted in Table 2, show that the research model fits the data well, with all fit indices meeting their respective criteria, and with all path coefficients being significant ($t > 1.96$). These results suggest that engagement mediates the relationship between job resources and proactive behaviour in both samples. Hence, hypothesis 2 is supported. The significant positive path coefficient linking job resources with work engagement is in accordance with hypothesis 1. The full mediation model explains on average 50.5% of variance in engagement (46% in Spanish and 55% in the Dutch sample) and an average of 36.5% of variance in proactive behaviour (37% in Spanish and 36% in the Dutch sample).

However, in order to test whether the impact of job resources on proactive behaviour is fully or partially mediated by engagement, additional analyses were carried out. Three competitive models were fitted to the data in both samples separately. The full mediation research model (M1) was compared with a partial mediation model (M2) that assumes an

Table 2. Model fit in the Spanish ($n = 386$) and the Dutch sample ($n = 338$).

		χ^2	df	p	GFI	AGFI	RMSEA	NFI	IFI	CFI
Spain	M1	18.833	8	.01	.98	.95	.05	.95	.97	.97
	M2	17.121	7	.01	.98	.95	.06	.95	.97	.97
	M3	50.333	8	.00	.95	.89	.11	.86	.88	.88
Netherlands	M1	84.373	8	.00	.92	.80	.16	.90	.90	.90
	M2	83.859	7	.00	.92	.78	.18	.89	.90	.90
	M3	143.677	8	.00	.89	.71	.22	.82	.83	.83

Notes. χ^2 = Chi-square; df = degrees of freedom; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; RMSEA = Root Mean Square Error of Approximation; NFI = Normed Fit Index; IFI = Incremental Fit Index and CFI = Comparative Fit Index. M1 = Research full mediation model. M2 = Partial mediation model. M3 = Alternative model.

additional direct path from job resources to proactive behaviour. As can be seen from Table 2, in both samples the fit of M2 is *not* superior to that of M1. Besides, the direct path from job resources to proactive behaviour lacks significance ($t = 1.13$ in the Spanish sample and $t = 0.73$ in the Dutch sample). Hence, as assumed in hypothesis 2, it is concluded that engagement fully mediates the relationship between job resources and proactive behaviour among Spanish and Dutch employees.

Next, in order to rule out the possibility of proactive behaviour mediating between job resources and engagement, the corresponding alternative model (M3) was fitted to the data of both samples separately. As can be seen from Table 3, in both samples the fit of M3 was inferior to that of M1. Hence, it is concluded that proactive behaviour does not play a mediating role.

Finally, in order to test Hypotheses 3 about the invariance of the model across both national samples, a multiple-group analysis was carried out including both samples simultaneously. This method provides more efficient parameter estimations than either of the two single-group models (Arbuckle 1997). Besides, using a multiple-group analysis the equivalence of path coefficients across samples can be assessed. As expected from the previous analyses, M1 provides a good fit to the data across both samples, with all fit indices meeting their corresponding critical values (see Table 3). However, the fit deteriorated significantly when all path coefficients were constrained to be equal in both samples (M1_c). This means that, although the underlying structure of latent and manifest variables is similar in both samples, the sizes of the path coefficients differ.

Next, in order to assess the invariance of M1 in greater detail, two additional models were fitted to the data: (1) M1_{st} that assumes only the structural paths between resources and engagement and between engagement and proactivity to be invariant, and (2) M1_{fa} that assumes only paths running from latent factors to manifest variables (i.e. factor loadings) to be invariant. As can be seen from Table 3, the fit of M1_{fa} is inferior compared to that of M1, whereas that of M1_{st} is not. This means that the structural paths between the three latent constructs are invariant across both samples, whereas the factor loadings differ systematically.

In the final step, an iterative process was used as recommended by Byrne (2001) in order to assess the invariance of each factor loading separately (see also Schaufeli et al. 2002b). That is, the invariance of each factor loading was assessed individually by comparing the fit of the model in which a particular loading was constrained to be equal across both samples with that of the previous model in which this was not the case. When the fit did *not* deteriorate, this constrained factor loading was included in the next model in which another constrained estimate was added, and so on.

The final model (M1_f) showed that the structural paths between the latent variables as well as the factor loading of feedback on job resources proved to be invariant across both samples (see Figure 2). Hence, hypothesis 3, that assumes the invariance of the mediation model, is partly supported.

Discussion

The current study researched the mediating role played by work engagement in the relationship between job resources (i.e. job control, feedback and variety) and proactive behaviour (see Figure 1). It was found that, as hypothesized, work engagement fully mediates the impact of job resources on proactive behaviour at work: that is, an increase in job resources is related to an increase in work engagement, which, in its turn, is positively related to proactive work behaviour. No direct relation between job resources and proactive behaviour

Table 3. Model fit, multiple group analyses including the Spanish (n = 386) and the Dutch samples (n = 338).

	χ^2	df	p	GFI	AGFI	RMSEA	NFI	IFI	CFI	$\Delta\chi^2$	Δdf
M1	103.219	16	.00	.91	.88	.08	.91	.92	.92		
M1 _c	136.831	20	.00	.94	.87	.09	.88	.90	.89	M1 _c -M1 = 33.61***	4
M1 _{st}	105.956	18	.00	.95	.89	.08	.91	.92	.92	M1 _{st} -M1 = 2.73	2
M1 _{fa}	121.797	18	.00	.94	.87	.09	.89	.91	.91	M1 _{fa} -M1 = 18.481***	2
M1 _{fi}	106.366	19	.00	.95	.90	.08	.91	.92	.92	M1 _{fi} -M1 = 3.147	3

Notes. χ^2 = Chi-square; df = degrees of freedom; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; NNFI = Non-Normed Fit Index; IFI = Incremental Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation. *** p < .001. M1 = Research model (freely estimated); M1_c = Fully constrained model. M1_{st} = Constrained structural paths; M1_{fa} = Constrained latent factors paths; M1_{fi} = Final model.

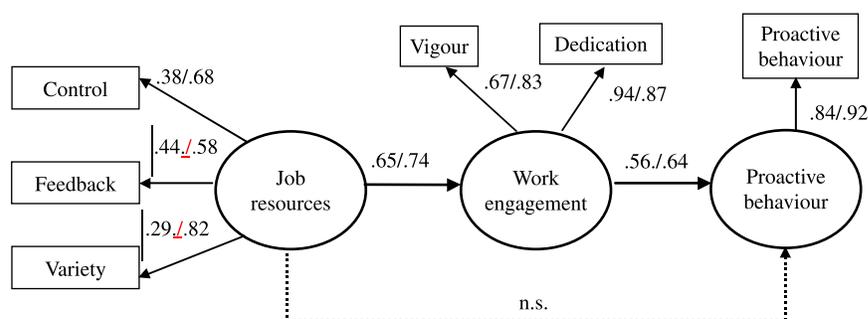


Figure 2. The final model (standardized path coefficients). Results of the multigroup analysis (Spain/the Netherlands).

was observed, and an alternative model that assumes a mediating role of proactive behaviour between job resources and work engagement, did not fit the data well. This means that hypothesis 1, assuming a positive relationship between job resources and work engagement, as well hypothesis 2, assuming full mediation of work engagement, are confirmed.

The robustness of the research model is illustrated by the fact that the model fits about equally well in two different occupational samples (ICT workers and telecom managers) that originate from two different countries (Spain and the Netherlands, respectively). Moreover, the structural paths running from job resources to engagement and from engagement to proactive behaviour are equally strong in both samples. Also, the fact that in both samples slightly different measures of resources and proactive behaviour were used strengthens our findings. Hence, despite the fact that proactive behaviour refers to slightly different work behaviours in both samples (i.e. coping with technological demands for ICT workers and performing managerial tasks in a changing business environment for managers) the motivational mechanism seems to be similar across both work-settings and countries. Although the robustness of the model itself does neither explain its usefulness nor its contribution it does add to the confidence that we have in the generalizability of the results. In jobs where new technologies are continuously implemented (ICT employees) as well as in modern, rapidly changing organizations (where telecom managers are employed) proactive behaviour is essential in order to cope effectively with change. In addition, our results exemplify the crucial role of job resources that foster intrinsic motivation (i.e. vigour and dedication) and – indirectly – proactive behaviour at work.

Theoretical implications

Our results agree with recent research about how job resources increase intrinsic motivation and – in their turn – increase specific positive behaviours, such as proactive behaviour at work (Crant 2000; Parker 2000; Houkes et al. 2001) or job performance (Salanova et al. 2005a). But also, our findings suggest that instead of directly affecting proactive behaviour, job resources indirectly affect proactivity via increasing levels of work engagement. In fact, on a more general level this agrees with Hackman and Oldham's (1980) Job Characteristics Theory that assumes that so-called critical psychological states (i.e. meaningfulness, responsibility, and knowledge of the results) mediate between job characteristics (i.e. resources such as variety, task identity, task significance, autonomy and feedback) and outcomes (i.e. motivated proactive behaviour). In our study, work engagement seems to play a role analogously to critical psychological states. In a similar vein, in their comprehensive theoretical model of personal initiative,

Frese and Fay (2001) hypothesized that job resources ('environmental supports' such as job control, job complexity, and feedback) have an indirect impact on personal initiatives through so-called 'orientations' (i.e. self-efficacy, control appraisals, handling errors, change orientation, and active coping). In other words, our results confirm that similar job resources that are included in the models of Hackman and Oldham (1980) and of Frese and Fay (2001) are indirectly related to proactive behaviour. More specifically, our measures of job control and variety are quite similar to those termed 'autonomy' and 'complexity' in both other models, respectively.

On the other hand, our findings also go beyond both models, because in their cases the intermediate psychological states or orientations are primarily cognitive in nature (e.g. knowledge of the results, self-efficacy, control appraisals), whereas engagement is also an affective state. Hence, it appears that job resources not only affect employee's cognitions, but also his or her feelings about the job, which in turn seems to spur proactive behaviour. The fact that positive affects, such as engagement seems to lead to proactive behaviour in employees agrees with the so-called 'Broaden-and-Build' theory of positive emotions (Fredrickson 2001). This theory posits that the experience of positive emotions broadens thought-action repertoires and builds enduring personal resources. Although Fredrickson's theory is about emotions such as joy, interest and contentment, it can be speculated that work engagement, that includes enthusiasm, pride, inspiration and challenge might have a similar effect in broadening habitual modes of thinking and acting, and thus increasing the likelihood of displaying proactive work behaviour.

Practical implications

Our findings suggest that rather than considering proactivity as a personal disposition that is relatively stable across time and across work situations (e.g. Bateman and Crant 1993; Parker 2000), it may also be considered as specific work behaviour (i.e. in terms personal initiative) that is related to perceived levels of job resources. Practically speaking in terms of Human Resources Management, the former view calls for recruitment and selection, whereas in the latter view proactivity may be fostered by an appropriate job (re)design; that is, particularly by increasing or supplying additional job resources.

Our findings also suggest that job resources do not directly impact on proactivity but *indirectly* through increased levels of work engagement. The finding that engagement is directly related to proactive behaviour offers the possibility to increase engagement through other means than through increasing job resources, in order to boost proactive work behaviour. For instance Salanova et al. (2005b) showed that engagement may be increased by enhancing levels of efficacy beliefs in two samples of Spanish and Dutch university students, respectively. An upward positive spiral was found in which past academic success reinforces efficacy beliefs and engagement, resulting in more positive future efficacy beliefs. In this way, efficacy beliefs may boost engagement levels' among students. Hence, a training programme aimed at increasing levels of efficacy might result in increasing employees' work engagement as well.

Limitations and further research

First, our results may partly be influenced by common method variance because self-report questionnaires were used to measure job resources, work engagement and proactive behaviour. Although most studies in the field exclusively rely on self-reports, job resources might also be assessed by observer ratings that are based on a thorough job analysis (e.g. Demerouti et al. 2001), whereas for the measurement of personal initiative an interview

based measure exists (Frese et al. 1997; Fay 1998). Hence, our research model could be tested in future using expert ratings and interviews to assess job resources and proactive behaviour, respectively. It should be noted in favour of the present study, however, that correlations between self-reported and observed job resources (i.e. feedback and job control; Demerouti et al. 2001) and between a personal initiative questionnaire and an interview (Fay and Frese 2001) are consistently positive, thus confirming their congruent validity.

Second, our study used a cross-sectional design, which means that the arrows that are depicted in Figures 1 and 2 should not be interpreted as causal relations but as associations that might suggest a certain causal ordering that should be confirmed in future longitudinal research. The fact that the alternative model with its assumption that instead of engagement, proactivity would play a mediating role, showed a poor fit to the data, suggested that this alternative causal ordering is less likely. However, only longitudinal research can adequately disentangle cause and effect. Such longitudinal research could also uncover reciprocal causal relationships, particularly between proactive work behaviour and job resources. According to the COR-theory (Hobfoll and Shirom 2000), employees are motivated to obtain and accumulate resources in order to effectively deal with future stressors and strains. Viewed from this perspective, our conceptualization of proactivity can be seen as a way of proactive coping as described by COR-theory: by acting proactively employees increase their job resources such as control, variety and feedback, which makes them less vulnerable in cases they find themselves under stress (Westman, Hobfoll, Chen, Davidson and Laski 2005). Moreover, these increased resources would enhance proactive behaviour (via engagement), thus setting a so-called 'gain spiral' in motion leading to a progressive accumulation of resources (Hobfoll and Shirom 2000). In other words, future longitudinal research should investigate the dynamic, reciprocal nature of job resources, work engagement, and proactive behaviour and thus expand the results of our cross-sectional study.

Final note

The current research contributes to the ongoing debate about the motivational potential of job resources. In accordance with previous models, such as Hackman and Oldham's (1980) Job Characteristics Theory, an intermediate psychological state was found to play a mediating role between job resources and a specific type of work behaviour (i.e., proactivity). However, unlike in previous models, this psychological state – work engagement – is not cognitive but affective and motivational in nature.

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