Received 19 November 2014
Revised 7 July 2015
Accepted 20 January 2016

The work engagement grid: predicting engagement from two core dimensions

Patrícia Lopes Costa
ISCTE-Instituto Universitário de Lisboa, Lisbon, Portugal
Ana Margarida Passos
Business Research Unit, ISCTE-Instituto Universitário de Lisboa, Lisbon, Portugal, and
Arnold B. Bakker
Erasmus University Rotterdam, Rotterdam, The Netherlands

Abstract

Purpose – The purpose of this paper is to test whether work engagement can be predicted by two core dimensions, energy and involvement, both at the individual and team levels.
Design/methodology/approach – Based on the circumplex model of affective well-being (Russell, 1980), the authors propose the work engagement grid and collect data on individual and team work engagement (TWE) from two different samples ($n = 1{,}192$ individuals).
Findings – Results show a significant positive relationship between the individual engagement grid and individual work engagement. However, only the energy dimension significantly predicted TWE. The authors also provide evidences for the relationship between the engagement grid and related variables (e.g. adaptive performance, team cohesion, satisfaction), and show that the combination of energy and involvement present smaller correlations with those variables than the complete engagement scales.
Research limitations/implications – Data were collected from simulation samples, therefore generalization of the findings must be done with caution. The findings allow for developing a brief measure of work engagement, particularly useful for longitudinal or diary study designs.
Practical implications – When teams are the work unit, the displays of energetic behaviors ought to be fostered in order to boost collective engagement.
Originality/value – The authors add to the existing literature on work engagement, concluding that individual and team-level work engagement have structural differences between them, with the collective construct being dependent on external manifestations of energy, and that individual work engagement needs a cognitive component of absorption in order to foster performance.

Keywords Engagement, Involvement, Energy, Work engagement grid
Paper type Research paper

Introduction

In the last decade, the scientific literature has validated the importance of considering work engagement for many relevant outcomes such as employees' performance (e.g. Demerouti and Cropanzano, 2010), leaders' creativity and charisma (e.g. Bakker and Xanthopoulou, 2013) and well-being (e.g. Bakker and Leiter, 2010), both at the individual and at the team level (e.g. Salanova *et al.*, 2003; Costa *et al.*, 2014b). Most of the research on work engagement at the individual level validated its three-factor structure, composed by vigor, dedication and absorption (e.g. Bakker and Leiter, 2010). At the team level, however, this three-factor structure has not been found in some studies (Costa *et al.*, 2014a), where those factors collapse into a single dimension. The dimensionality of the construct may, therefore, distinguish it between levels. Indeed, as team work engagement (TWE) is defined as an emergent phenomenon

Journal of Managerial Psychology
Vol. 31 No. 4, 2016
pp. 774-789

0268-3946
DOI 10.1108/JMP-11-2014-0336

(Kozlowski and Chao, 2012), it will develop from team members' interaction. On the contrary, individual work engagement is defined as an individual state of work-related well-being and therefore does not need any external manifestation to develop. It is likely, therefore, that the key theoretical dimensions of work engagement weigh differently at the individual and team levels.

What is more, some authors suggest that, to the extent that work engagement can be conceptualized as the antipode of job burnout, there are two main dimensions common to both constructs: an energy continuum (from exhaustion to vigor) and an involvement continuum (from cynicism to dedication) (Schaufeli and Bakker, 2004, 2010; González-Romá *et al.*, 2006). To our knowledge, this proposition has not yet been empirically tested.

The main goal of the present study is to test whether work engagement can be predicted by these two dimensions. Simultaneously, this study aims at exploring the construct at both the individual and team levels' and at unveiling what can structurally distinguish them. Our work contributes to the literature on employee engagement in two different ways. First, it tests a theoretical proposal related to two core engagement dimensions; and second, it explores whether they behave differently across levels.

Theoretical background

Work engagement is a positive, fulfilling, affective-motivational state of work-related well-being (Leiter and Bakker, 2010). In the last ten years, many studies have demonstrated its importance for both the performance and the well-being of employees (Halbesleben, 2010). For example, Schaufeli *et al.* (2008), in a study of middle managers, found that work engagement was related to working extra hours, job satisfaction, as well as good social functioning and positive health. Also, Bakker (2009) reports that engaged employees are self-efficacious individuals who actively act in order to influence events that are relevant for their lives. They are characterized by high energy and activity levels and by a positive attitude that allows them to create their own positive feedback and recognition. Work engagement has also important consequences for organizational outcomes (Schaufeli and Bakker, 2010), such as organizational commitment, personal initiative or extra-role behavior. For example, Salanova and Schaufeli (2008) in a study of a Spanish ($n = 386$ technology employees) and a Dutch ($n = 338$ telecom managers) samples found that work engagement mediated the relationship between job resources and proactive behavior and that this relationship was invariant across countries.

Work engagement is predicted by the existence of job resources, defined as physical, psychological, social or organizational aspects of the job that may be functional in achieving work goals, help reduce job demands and the associated physiological and psychological costs, and that stimulates personal growth and development (Bakker and Demerouti, 2007). Examples of job resources are job control, feedback, autonomy, variety and social support.

The relevance of work engagement is also found at the team level of analysis. TWE is defined as a shared and emergent state of work-related well-being (Costa *et al.*, 2014b). The distinction between individual and TWE is patent in this definition: first, whereas individual work engagement describes the perceptions of one individual about his or hers level of engagement, TWE represents a commonly held perception of the engagement of the team as a whole. Therefore, team members must agree on their perception of the collective level of engagement; second, it is an emergent state (Kozlowski and Klein, 2000) that, by definition, describes cognitive, motivational and affective states of teams and depends on the interaction between team members. The theoretical model of TWE highlights the relevance of affect management,

motivation building and conflict management processes for its emergence (Costa *et al.*, 2014b), whereas individual work engagement predictors are studied under the job demands-resources model (Demerouti *et al.*, 2001).

Empirical work on TWE reported evidences for the positive association between TWE and variables such as task and team performance, collective positive affect, efficacy beliefs and individual-level work engagement (e.g. Salanova *et al.*, 2003; Bakker *et al.*, 2006; Torrente *et al.*, 2012). Despite the theoretical differences between levels, the rationale behind the studies on TWE is that the team-level construct is equivalent to the individual level One on its function (as a mediator between certain resources and outcomes) and also on its dimensions (Costa *et al.*, 2014b). Therefore, researchers tend to assume that the core dimensions of engagement are the same across levels: vigor, dedication and absorption.

Following the last decade's empirical research on engagement, two theoretical developments have been put forward. First, Bakker and Oerlemans (2011) have suggested that work engagement can be positioned in the circumplex model of affective well-being (cf. Figure 1). This model was proposed by Russell (1980) and its basic premise is that affective states depend on two different neurophysiological systems that determine each emotion. Contrary to the perspective of discrete emotions (e.g. Ekman, 1973), Russell's two systems are best represented as two continua: a pleasure-displeasure axis and an arousal axis. For example, feeling irritated results from a combination of a high activation and unpleasant emotions, whereas feeling content results from the opposite combination: pleasant emotions and low activation. Work engagement is represented in the upper right quadrant of the circumplex model – a highly active and pleasant state.

The second conceptual development concerns engagement's core dimensions. Bakker *et al.* (2011) acknowledged that engagement has two core dimensions – energy and involvement. In 2003, Schaufeli and Bakker (2003) had proposed a three dimensional structure of work engagement, characterized by vigor (high levels of energy while working), dedication (being strongly involved in one's work, experiencing a sense of enthusiasm) and absorption (being fully concentrated in one's work).

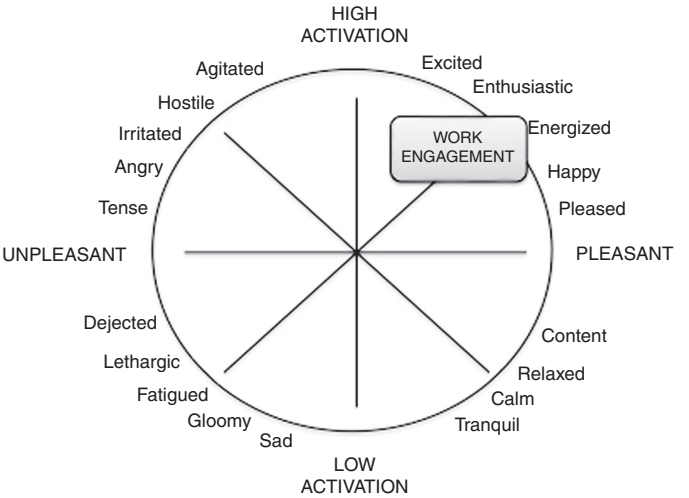

Figure 1.
Work engagement within the circumplex model of affect

Source: Adapted from Bakker and Oerlemans (2011)

Different conceptualizations had also been proposed in the literature. For example, Maslach (1999) defines engagement by other three dimensions, opposite to those of burnout: energy, involvement and efficacy. Nonetheless, two broad dimensions of engagement seem to have gathered the consensus of researchers: energy and involvement/identification (Schaufeli and Bakker, 2004, 2010; González-Romá *et al.*, 2006). Empirically, the three-factor structure was not found in some samples, at the team (Costa *et al.*, 2014a) and individual (Shimazu *et al.*, 2008; Sonnentag, 2006) levels. What is more, the three dimensions of the scale consistently show strong correlations between them as high as 0.80 or 0.90 between the latent factors (Schaufeli and Bakker, 2010), demonstrating that the three proposed dimensions are very closely related. As a consequence, Schaufeli *et al.* (2006) recommend the use of the total score in UWES as an indicator of engagement, instead of analyzing the three dimensions separately. Theoretically, then, "work engagement is a distinct psychological construct that consists of two core dimension energy and identification" (Bakker *et al.*, 2011, p. 9).

This proposal was developed for the individual level of analysis, and to our knowledge, no attempts have been made to consider those two dimensions as the determinants of the construct at the team level. Considering that TWE's existence depends on a shared perception of the collective level of engagement, and that it is rooted on individuals' interaction, team members need to rely on observable cues from others to infer that collective level, i.e., there is the need to consider more proximal antecedents of TWE in terms of behavioral expression. Energy is clearly demonstrated by behavioral indicators such as pace of speed or tone of voice, and therefore, should be one of the touchstones for evaluating the team's level of engagement. In what involvement is concerned, observable indicators could be less obvious. Nonetheless, talking enthusiastically about their tasks, discussing task-related issues during breaks or working overtime with eagerness can provide the necessary hints to infer whether or not the team, as a whole, is involved with their work.

The present study

Considering that, to our knowledge, there is no measure that encompasses both energy and identification/involvement, we developed an alternative one, based on the two theoretical developments already described. Our proposal (cf. Figure 2) reflects the two core dimensions of energy and involvement. The energy dimension is represented by the vertical axis (from high energy to low energy or exhaustion); the horizontal axis

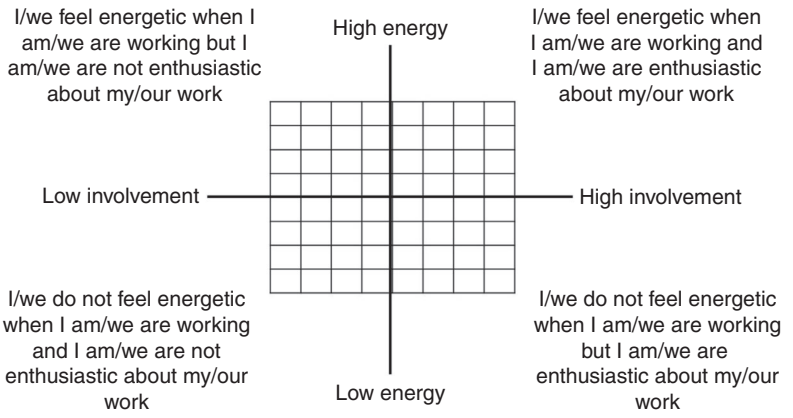

Figure 2.
Work engagement grid

represents the involvement dimension (from low involvement to high involvement). The circle was transformed into a grid, where respondents signal with a cross the place that best describes their work-related state in a given timeframe. The grid emerges, then, from the crossing of the two axis, each with eight points, and is therefore composed of 64 possibilities for answers. We have opted for an eight-point scale in order to, in future studies, be able to define four quadrants, and to position work engagement in the upper right one, as defended by Bakker and Oerlemans (2011). In the extreme of each quadrant, a brief description of what it represents is provided (e.g. in the lower right corner, representing low activation and high involvement: "I/we do not feel energetic when I am/we are working but I am/we are enthusiastic about my/our work"):

H1a. The interaction between energy and involvement is positively related to work engagement.

H1b. The interaction between collective energy and collective involvement is positively related to TWE.

If the two core dimensions of the grid capture the essence of the construct, it is expected that measuring individual engagement both with UWES and with the work engagement grid will reflect similar relationships between this and other constructs. The same reasoning is applied to TWE: we expect that the value of engagement derived from the scale and the value of engagement reported by the team engagement grid will have similar patterns of correlations with related variables.

First, and following previous research it is expected that engagement, both individual and team level, correlates positively with performance and with individuals' satisfaction. Being a positive state of well-being, worked engaged employees will also tend to report a tendency for feeling positive emotions.

Adaptive performance (Pulakos *et al.*, 2000) is a multidimensional construct defined by the capacity for creative problem solving, dealing with uncertain and unpredictable work situations, learning new tasks, technologies and procedures, interpersonal, cultural and physical adaptability. Since adapting to new situations requires a certain degree of change (that requires cognitive, physical, emotional and interpersonal resources), when the levels of energy are high, adapting might be facilitated. Moreover, the more individuals identify with their work and are involved in it, the more likely they are to invest in changing their behavior or attitudes, if required by their job. Therefore, adaptive performance and work engagement are likely to be positively related, both at the individual and team levels.

Team cohesion is the "tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of members' affective needs" (Carron *et al.*, 1998, p. 213). Specifically at the team level, team cohesion may be related to the teams' level of engagement: the more team members want to stay together and work for the satisfaction of their members' needs, the more they are likely to be involved in their teams tasks and invest energy while working:

H2a. The overall UWES score and the engagement grid score (i.e. interaction between energy and identification) have equivalent positive relationships with performance, individual satisfaction, positive emotions and individual adaptive performance:

H2b. The overall TWE scale score and the team engagement grid score (interaction between team energy and team identification) have equivalent positive relationships with performance, positive emotions, team adaptive performance and team cohesion, analyzed at the team level.

Method

Participants and procedure

Data on individual and team-level work engagement was collected from two different samples, in order to avoid common method biases (Podsakoff *et al.*, 2003). Both samples were similar in terms of demographic characteristics and on the tasks they were performing. Participants were competing in the "Global Management Challenge®" (GMC®), a management simulation provided by a company specialized in developing management simulations. During a five-week period, participants must manage a virtual company. They all start with the same stock market share value and will have to make five strategic and management major decisions throughout the competition, each one comprising 66 micro decisions in issues such as prices of products, marketing channels, production volume, human resources practices. Each week, the teams receive an individual report with the consequences of their decisions, both in terms of stock market share value and relative position considering all teams. For the present study, data were collected in the 2011 (individual work engagement) and 2012 (TWE) editions through electronic questionnaires, sent to all team members individually, immediately after the submission of the decisions and before receiving feedback. In 2011, data were collected in week 3, on individual-level variables (in this sample, we did not collect data on cohesion, as it is, by definition, a team-variable only); in 2012, data were collected both in weeks 3 and 5. Since TWE is a team construct, teams might need some more time for it to emerge within them. The sample from 2011 consisted of 764 individuals organized in 167 teams (average team size = 4.7 members; SD = 0.60). Teams were composed either by graduate and undergraduate students (39.5 percent), full-time workers (43.7 percent) or by a mix of students and workers (16.8 percent); 67.8 percent of participants were men and 27.5 percent were over 33 years. In this sample, 40.8 percent of workers had a university degree. The sample from 2012 consisted of 428 individuals organized in 96 teams (average team size = 4.6 members; SD = 0.61). Individuals were mostly over 33-years old (32.5 percent) or and between 18 and 21 (28.7 percent), and only 10 percent of workers did not have a university degree. Teams were composed either by graduate and undergraduate students (46 percent), full-time workers (50.5 percent) or by a mix of students and workers (3.5 percent); 64.6 percent of participants were men.

Measures

Individual work engagement was measured by UWES (Schaufeli *et al.*, 2002). Example of items are "I feel bursting with energy when I am working"; "I feel strong and vigorous when I am working"; "I get carried away when I am working" (1 = never to 7 = always).

TWE was measured by TWES (Costa *et al.*, 2014a). Example of items are "At our work, we feel bursting with energy"; "At our work, we feel strong and vigorous"; "We get carried away when we are working") (1 = never to 7 = always).

Energy and involvement were measured using the work engagement grid. For data analysis purposes, each point on the grid was transformed in order to code each dimension separately (energy and involvement), each in an eight-point scale. Later, the interaction between the two dimensions was computed. Therefore, for each individual answer, we had three values: a value for energy, a value for involvement and the interaction value. At the individual level, the sentences in each corner of the grid were referring to individuals (e.g. "I do not feel energetic when I am working but I am enthusiastic about my work") whereas at the team level they referred to the collective (e.g. "We do not feel energetic when we are working but we are enthusiastic about our work").

In order to address *H2a* and *H2b*, we collected data on other variables. In the sample from 2011 (individual work engagement), we collected data on individual adaptive performance, positive emotions, satisfaction and objective performance. In the 2012 (TWE) sample, we collected data on team adaptive performance, positive emotions, team cohesion and objective performance. With this sample, for addressing *H2*, all variables were aggregated to the team level of analysis.

Objective performance was assessed at the end of the competition, whereas the other variables were assessed at the same time as work engagement. It was operationalized using each team's share price at the end of the competition. We recoded the share price through the percentile values, by asking for cut points for eight equal groups. Therefore, each team's performance was coded in a scale of 1-8, depending on their percentile. The lowest share prices correspond to lower values and the highest share prices correspond to higher values. This measure was discussed and constructed on the basis of recommendations of the developers of the Global Management Challenge®.

Individual adaptive performance was measured with 15 items derived from Pulakos *et al.* (2000) adaptive performance dimensions. Items were adapted based on the definitions being provided by the authors to describe each dimension of adaptive performance efficacy (e.g. "During this competition, I had to solve problems for which there were no easy or straightforward answers") (1 = I totally disagree to 7 = I totally agree).

Satisfaction was measured using eight items developed for this competition. Individuals were asked to evaluate their degree of satisfaction with several aspects of their work (e.g. work team, their decisions, their strategy, the team leader (1 = extremely dissatisfied to 7 = extremely satisfied).

Positive emotions were measured using two different scales, one in each sample. In sample 1, they were measured using five items from PANAS (Watson *et al.*, 1988): enthusiastic, active, interested, inspired and attentive (1 = I totally disagree to 7 = I totally agree). In sample 2, we used five items derived from the job-related affective well-being scale (Van Katwyk *et al.*, 2000): enthusiastic, satisfied, proud, calm and at ease (1 = I totally disagree to 7 = I totally agree).

Team adaptation was measured with ten items derived from Pulakos *et al.* (2000). Example of items is "My team is effective in learning new ways of analyzing the relevant information to make decisions") (1 = I totally disagree to 7 = I totally agree).

Team cohesion was measured with five items from Careless and DePaola (2000). Example of the items is "Our team likes to hang out after we are working in the competition." (1 = I totally disagree to 7 = I totally agree).

Results

Individual work engagement

Table I presents the means, standard deviations and correlations between the variables measured with sample 1.

Our approach to test *H1* was as follows: we converted the three values obtained from the grid (involvement, energy and the interaction between the two) in standardized values (*z*-values) and regressed them on the values obtained with the work engagement scale. First, we regressed the values from the two axes and then we entered the interaction into the model. The results of this regression analysis tell us whether the individuals' answers to the UWES scale can be predicted by their responses to the engagement grid.

When considered individually, only the involvement axis significantly predicts work engagement ($B = 0.27$; $p < 0.001$). When the interaction was entered in the model, both axis became significant ($B = 0.34$; $p < 0.001$ for involvement and $B = 0.38$, $p < 0.001$ for energy). The interaction, depicted in Figure 3, is also significant ($B = 0.35$; $p < 0.001$). Therefore, high-work engagement, as measured by the UWES, corresponds to a high involvement with work, especially when there are also high levels of energy. Therefore, *H1a* was supported.

We than addressed *H2a*, by inspecting the correlations of UWES, each dimension of the grid considered separately and the interaction value with the chosen variables.

The correlations of those four values with individual adaptation, positive emotions and satisfaction was significant and positive. The magnitude of the correlations for UWES is approximately twice as large as the correlations with the interaction of the two grid dimensions. In what performance is concerned, only the UWES shows a significant correlation, and not the values obtained from the grid. *H2a* was, then, only partially supported.

TWE

Prior to any analysis, data were aggregated to the team level in order to guarantee we were actually in the presence of collective constructs, following Chan's (1998) rationale

	Mean	SD	1	2	3	4	5	6	7	8
1. Work engagement	5.39	1.06	(0.97)							
2. Involvement	5.86	1.88	0.31**							
3. Energy	6.17	1.82	0.25**	0.73**						
4. Involvement×Energy	38.95	17.41	0.37**	0.93**	0.88**					
5. Individual adaptation	5.49	0.84	0.59**	0.20**	0.21**	0.27**	(0.98)			
6. Positive emotions	5.41	1.15	0.79**	0.32**	0.26**	0.37**	0.56**	(0.95)		
8. Satisfaction	5.9	0.96	0.59**	0.18*	0.18**	0.25**	0.62**	0.58**	0.62**	(0.97)
9. Performance	5.29	2.13	0.13**	0.16	0.00	0.021	0.10*	0.12**	0.18**	0.19**

Notes: Cronbach's α for each scale between brackets. $^{**}p < 0.01$; $^{*}p < 0.05$

Table I.
Means, standard deviations and correlations between all variables in sample 1

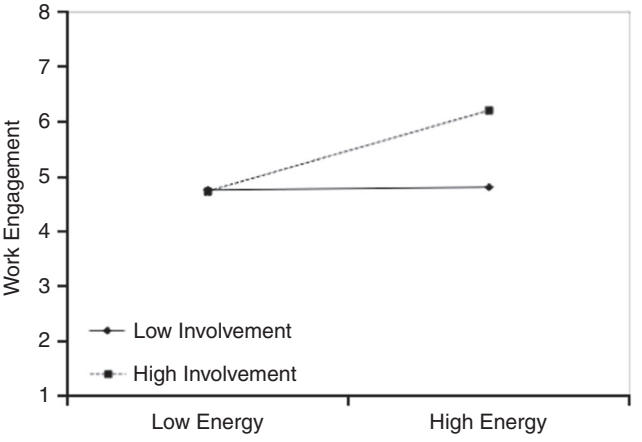

Figure 3.
Interaction between the energy and involvement axis in predicting work engagement, as measured by the UWES

on composition models (a comprehensive review of these models is beyond the scope of this paper and the reader is referred to the original paper). Table II presents the means, standard deviations, $rwg_{(j)}$'s, $ICC_{(1)}$, $ICC_{(2)}$ values for all the variables, both in times 3 and 5.

At time 3, some aggregation indices for the grid dimensions (i.e. $ICC_{(1)Energy} = 0.03$; $ICC_{(1)Involvement} = 0.05$), for the interaction of both ($ICC_{(1)A\times B} = 0.05$; $rwg_{(j)A\times B} = 0.68$), and for cohesion ($ICC_{(1)} = 0.25$) were not within the acceptable values of above 0.70 for $rwg_{(j)}$ (James *et al.*, 1984) and within 0.05 and 0.20 for $ICC_{(1)}$ (DeShon *et al.*, 2004). This may suggest that, after only three weeks of the competition, teams had not yet developed a common perception of these issues. Therefore, and considering that team constructs depend on the agreement between team members and that this agreement has to be statistically justified prior to any other analysis, only the results from time 5 were considered.

We followed the same procedure used with sample 1 to test *H1b*. When only the dimensions were entered in the model, the regression of TWE on each one of them was significant ($B = 0.15$; $p < 0.05$ for involvement and $B = 0.59$; $p < 0.001$ for energy). When the interaction was entered in the model, a similar result was found for each dimension ($B = 0.17$, $p = 0.044$ for involvement and $B = 0.58$, $p = 0.000$ for energy). The interaction was not significant ($p = 0.64$) when controlling for the two dimensions and also if considered alone ($B = 0.03$, $p = 0.59$). Therefore, *H1b* was not supported. At the team level, work engagement is defined essentially by high levels of energy: the individuals' answers to the TWES scale are predicted only by their answers to the energy dimension of the engagement grid, and not to the involvement dimension.

In Table III, we present the correlations between all of the variables in time 5, used to test *H2b*. The TWES score correlated positively and significantly with all variables, with the exception of objective performance. The involvement dimension only positively and significantly correlated with one variable (team adaptation). The energy dimension positively and significantly correlated with all the variables, excluding team

	Mean	SD	$rwg_{(j)}$	$ICC_{(1)}$	$ICC_{(2)}$
Time 3					
TWE	5.51	0.72	0.84	0.11	0.35
Involvement	6.54	0.87	0.81	0.05	0.21
Energy	6.49	0.84	0.77	0.03	0.13
Involvement×Energy	42.91	9.26	0.68	0.05	0.20
Team adaptation	5.63	0.64	0.86	0.10	0.32
Positive emotions	5.03	0.71	0.83	0.09	0.31
Cohesion	5.30	0.94	0.82	0.25	0.60
Time 5					
TWE	5.48	0.82	0.83	0.13	0.42
Involvement	6.67	1.00	0.87	0.10	0.32
Energy	5.70	0.90	0.80	0.12	0.38
Involvement×Energy	38.6	9.85	0.75	0.13	0.20
Team adaptation	5.74	0.65	0.88	0.17	0.48
Positive emotions	5.09	0.77	0.85	0.09	0.34
Cohesion	5.35	0.92	0.76	0.11	0.36
Performance	5.29	2.14	–	–	–

Table II.
Means, standard deviations and aggregation indexes between the variables in sample 2, in times 3 and 5

	1	2	3	4	5	6	7
1. TWE	(0.97)						
2. Involvement	0.28**	–					
3. Energy	0.58**	0.48**	–				
4. Involvement×Energy	0.54**	0.80**	0.90**	–			
5. Team adaptation	0.68**	0.29*	0.50**	0.46**	(0.97)		
6. Positive emotions	0.80**	0.22	0.46**	0.44**	0.42**	(0.87)	
7. Cohesion	0.51**	0.23	0.22	0.25*	0.43**	0.41**	(0.70)
8. Performance	0.16	0.17	0.37**	0.32**	0.27**	1.0	0.01

Notes: Cronbach's α for each scale between brackets. The values are aggregated to the team level. **$p < 0.01$; *$p < 0.05$

Table III.
Correlations between the variables in sample 2, in time 5

cohesion. Only the interaction between the two dimensions correlated positively and significantly with all variables. *H2b* was, then, partially supported.

Discussion

This study tested whether the dimensions of energy and involvement predict work engagement, both at the individual and at the team levels, using two distinct but equivalent samples of a total of 1,192 individuals. The present work contributes to the understanding of work engagement at different levels of analysis, as well as to the distinction between the individual and team-level construct, considering its structure. Indeed, we had already different theoretical models for understanding work engagement at the individual (e.g. Demerouti *et al.*, 2001) and team (e.g. Costa *et al.*, 2014b) levels, which implied different specific predictors for each. We also had empirical work focussing on the structural part of the construct that had failed to confirm the three-factor structure at the team level (Costa *et al.*, 2014a). This work provides a possible framework for understanding the structural differences between levels, suggesting that individual and team-level work engagement differ in the predominance of one or two core dimensions: energy and involvement. The results support the claim that both dimensions predict individual work engagement. At the team level, engagement seems to be essentially defined by the existence of high levels of energy.

Our findings have theoretical, empirical and practical implications.

Theoretical implications

At the individual-level engagement is predicted by the interaction of energy and involvement, which is in line with the theoretical proposal of Bakker *et al.* (2011). It is possible that, as suggested by the authors, absorption may be a consequence of energy and identification and not a core dimension of the construct. Moreover, involvement seems to be the "baseline" necessary for individual engagement: when involvement is low, the level of energy does not influence individual engagement. When the involvement is high, the existence of high levels of energy will result in engaged employees.

The individual engagement grid correlates positively with individual adaptive performance, satisfaction and positive emotions. However, the magnitude of the correlations between the grid and these variables is smaller than the magnitude of the correlation of the UWES and the same variables and the engagement grid failed to show significant correlations with performance. Therefore, at the individual level, even if work engagement can be predicted by a combination of high energy and high

involvement, these two dimensions, *per se*, do not account for explaining its positive relation with performance. Nonetheless, one possible limitation of this study that is related to this finding is the use of a team-level index of performance (the team's stock market share price in the competition). The grid may be more sensitive to these level-issues than the nine-item scale. Future research is needed to understand whether using the individual-level performance as an outcome yields a different result. Other possible explanation implies going back to the absorption construct. At the individual level, absorption may be relevant for understanding performance, whether it is conceptualized as an outcome of engagement or as one of its core dimensions: when I am working alone, the concentration in what I am doing may be a crucial factor for success, and not just my energy and dedication. We incite researchers to explore whether absorption does indeed have this mediation role between engagement and performance.

The fact that TWE is essentially predicted by the shared perceptions of energy reflects the definition of TWE as an emergent state. According to Marks *et al.* (2001), emergent states are properties of the team, typically dynamic in nature, that describe cognitive, motivational and affective states of teams and that vary as a function of team context, inputs, processes and outcomes. They come to existence during and because of the interaction between team members. When people work together, they are likely to base their judgments on the cognitive, affective and motivational states of their team on observable cues and behaviors. The dimension of energy is subject to have more observable demonstrations (e.g. more gesturing, rapid pace of speech, higher tone of voice, etc.) than the dimension of involvement. Even though both individual and team engagement are functionally equivalent in leveraging performance and promoting work-related well-being, they may have a different structure across levels. At the higher (team) level, engagement may structurally be a more one-dimensional construct reflecting a common global evaluation of the team.

Similarly to what happens at the individual level, at the team level the magnitude of the correlations between the grid and other variables is smaller than the magnitude between the nine-item scales and the same variables. However, in what performance is concerned, we observe an inverse pattern than the one found at the individual level: it is the grid, and not the scale, that has significant correlations with objective team performance. This result may occur because the TWE scale used was extremely close to the individual level one, with only the referent shift (Chan, 1998). It is possible that the scale does not entirely reflect the construct of team work, engagement, since energy/vigor may be its central component. Again, further studies are needed to address this issue.

Practical implications

The original UWES scale is widely used to measure engagement. While being a solid and broadly validated instrument, in some occasions, it may be better to use a very brief measure of work engagement, for example, in studies with a longitudinal, repeated measures design in which participants need to fill out the items several times. These studies involve the risk of participants dropping out if scales are too long, because they get bored or have time constraints. Also, and since most measures used in the field of organizational psychology involve these types of scales, researchers may be prone to common method biases (Podsakoff *et al.*, 2003). Indeed, when presented with many items to answer to, individuals may engage in automatic cognitive processing. For example, the respondents may have the tendency to agree or disagree with questionnaire items regardless of content (the acquiescence bias, Winkler *et al.*, 1982)

that may result in inaccurate responses. Even when scales have reverse-coded items, individuals may not attend to the positive or negative wording of those items, which can result in an artificial "second factor" of the scale (Schmitt and Stults, 1986). Based on the results of this study, future research using this alternative measure of work engagement can be pursued, acknowledging that it does not represent the whole construct and can be considered more as a proxy.

Following the results of the present study about the dimensions of engagement the individual and team levels, some guidelines for managers can be considered, depending on whether their employees tend to work primarily individually or within work teams. In order to guarantee a high level of engagement, we incite team leaders and managers to guarantee employees' involvement especially when they are working individually: for example, by providing meaningful tasks, clearly stating the organization's vision or highlighting the purpose of work. However, when teams are the work unit, the displays of energetic behaviors ought to be fostered in order to boost collective engagement. This can be done, for example, by defining emotional display rules focussed on energetic demonstrations or by modeling behaviors from the leader or key elements.

Limitations and future research

The present study also has some limitations. Both of our samples were from a simulation situation and therefore generalizations of the results must be done with caution and a subsequent study with a "real life" sample is called upon. Another limitation may be having only team, and not individual performance as the outcome, which may have compromised the findings for the individual work engagement grid.

It would be interesting for future research to focus on the specific predictive power of each dimension considering different variables and distinct tasks. May be involvement is more relevant for engagement in highly cognitive tasks – reports writing, calculations, usually done individually – whereas energy is fundamental for the engagement in idea generation, creative tasks, managing others, etc. Future research should also focus on the integration of this new measure of engagement with the theoretical framework of work engagement – the job demands-resources model (Bakker and Demerouti, 2007) – and of TWE. Again, there may be specific resources, demands and other variables that are more related either to the energy or the involvement dimensions.

References

Bakker, A.B. (2009), "Building engagement in the workplace", in Burke, R.J. and Cooper, C.L. (Eds), *The Peak Performing Organization*, Routledge, Oxon, pp. 50-72.

Bakker, A.B. and Demerouti, E. (2007), "The job demands-resources model: state of the art", *Journal of Managerial Psychology*, Vol. 22 No. 3, pp. 309-328.

Bakker, A.B. and Leiter, M.P. (2010), *Work Engagement: A Handbook of Essential Theory and Research*, Psychology Press, Hove.

Bakker, A.B. and Oerlemans, W. (2011), "Subjective well-being in organizations", in Cameron, K.S. and Spreitzer, G.M. (Eds), *The Oxford Handbook of Positive Organizational Scholarship*, Oxford University Press, New York, NY, pp. 178-189.

Bakker, A.B. and Xanthopoulou, D. (2013), "Creativity and charisma among female leaders: the role of resources and work engagement", *The International Journal of Human Resource Management*, Vol. 24 No. 14, pp. 2760-2779.

Bakker, A.B., Albrecht, S.L. and Leiter, M.P. (2011), "Work engagement: further reflections on the state of play", *European Journal of Work and Organizational Psychology*, Vol. 20 No. 1, pp. 74-88.

Bakker, A.B., van Emerik, H. and Euwema, M.C. (2006), "Crossover of burnout and engagement on work teams", *Work and Occupations*, Vol. 33 No. 4, pp. 464-489.

Careless, S.A. and DePaola, C. (2000), "The measurement of cohesion in work teams", *Small Group Research*, Vol. 31 No. 1, pp. 71-88.

Carron, A.V., Brawley, L.R. and Widmeyer, W.N. (1998), "The measurement of cohesiveness in sport groups", in Duda, J. (Ed.), *Advances in Sport and Exercise Psychology Measurement*, Fitness Information Technology, Morgantown, WV, pp. 213-226.

Chan, D. (1998), "Functional relations among constructs in the same content domain at different levels of analysis: a typology of composition models", *Journal of Applied Psychology*, Vol. 83 No. 2, pp. 234-246.

Costa, P., Passos, A.M. and Bakker, A. (2014a), "Empirical validation of the team work engagement construct", *Journal of Personnel Psychology*, Vol. 13 No. 1, pp. 34-45.

Costa, P., Passos, A.M. and Bakker, A.B. (2014b), "Team work engagement: a model of emergence", *Journal of Occupational and Organizational Psychology*, Vol. 87 No. 2, pp. 414-436.

Demerouti, E. and Cropanzano, R. (2010), "From thought to action: employee work engagement and job performance", in Bakker, A.B. and Leiter, M.P. (Eds), *Work Engagement: A Handbook of Essential Theory and Research*, Psychology Press, New York, NY, pp. 147-163.

Demerouti, E., Bakker, A.B., Nachreiner, F. and Schaufeli, W.B. (2001), "The job demands-resources model of burnout", *Journal of Applied Psychology*, Vol. 86, pp. 499-512. doi: 10.1037/0021-9010.86.3.499.

DeShon, R.P., Kozlowski, S.W.J., Schmidt, A.M., Milner, K.R. and Wiechmann, D. (2004), "A multiple goal multilevel model of feedback effects on the regulation of individual and team performance in training", *Journal of Applied Psychology*, Vol. 89 No. 6, pp. 1035-1056.

Ekman, P. (1973), *Darwin and Facial Expression; A Century of Research in Review*, Academic Press, New York, NY.

González-Romá, V., Schaufeli, W.B., Bakker, A.B. and Lloret, S. (2006), "Burnout and work engagement: independent factors or opposite poles?", *Journal of Vocational Behavior*, Vol. 62 No. 2, pp. 165-174.

Halbesleben, J.R.B. (2010), "A meta-analysis of work engagement: relationship with burnout, demands, resources and consequences", in Bakker, A.B. and Leiter, M.P. (Eds), *Work Engagement: A Handbook of Essential Theory and Research*, Psychology Press, Hove, pp. 10-27.

James, L.R., Demaree, R.G. and Wolf, G. (1984), "Estimating within-group interrater reliability with and without response bias", *Journal of Applied Psychology*, Vol. 69 No. 1, pp. 85-88.

Kozlowski, S.W.J. and Chao, G.T. (2012), "The dynamics of emergence: cognition and cohesion in work teams", *Managerial and Decision Economics*, Vol. 33, pp. 335-354. doi: 10.1002/mde.2552.

Kozlowski, S.W.J. and Klein, K.J. (2000), "A multilevel approach to theory and research in organizations – contextual, temporal and emergent processes", in Klein, K.J. and Kozlowski, S.W.J. (Eds), *Multilevel Theory, Research and Methods in Organizations*, Jossey-Bass, San Francisco, pp. 3-90.

Leiter, M.P. and Bakker, A.B. (Eds) (2010), *Work Engagement: A Handbook of Essential Theory and Research*, Psychology Press, Hove.

Marks, M.A., Mathieu, J.E. and Zaccaro, S.J. (2001), "A temporally based framework and taxonomy of team processes", *Academy Management Review*, Vol. 26 No. 3, pp. 356-376.

Maslach, C. (1999), "A multidimensional theory of burnout", in Cooper, C.L. (Ed.), *Theories of Occupational Stress*, University Press, Oxford, pp. 68-85.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.-Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903.

Pulakos, E.D., Arad, S., Donovan, M.A. and Plamondon, K.E. (2000), "Adaptability in the workplace: development of a taxonomy of adaptive performance", *Journal of Applied Psychology*, Vol. 85 No. 4, pp. 1618-1624.

Russell, J.A. (1980), "A circumplex model of affect", *Journal of Personality and Social Psychology*, Vol. 39 No. 6, pp. 1161-1178.

Salanova, M. and Schaufeli, W.B. (2008), "Job resources, engagement and proactive behavior", *International Journal of Human Resource Management*, Vol. 19 No. 1, pp. 116-131.

Salanova, M., Llorens, S., Cifre, E., Martinez, I.M. and Schaufeli, W.B. (2003), "Perceived collective efficacy, subjective well-being and task performance among electronic work groups: an experimental study", *Small Group Research*, Vol. 34 No. 1, pp. 43-73.

Schaufeli, W.B. and Bakker, A.B. (2003), *Utrecht Work Engagement Scale: Preliminary Manual, Version 1*, Occupational Health Psychology Unit, Utrecht University, Utrecht.

Schaufeli, W.B. and Bakker, A.B. (2004), "Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study", *Journal of Organizational Behavior*, Vol. 25 No. 3, pp. 293-315.

Schaufeli, W.B. and Bakker, A.B. (2010), "Defining and measuring work engagement; bringing clarity to the concept", in Bakker, A.B. and Leiter, M.P. (Eds), *Work Engagement: A Handbook of Essential Theory and Research*, Psychology Press, Hove, pp. 10-24.

Schaufeli, W.B., Bakker, A.B. and Salanova, M. (2006), "The measurement of work engagement with a short questionnaire: a cross-national study", *Educational and Psychological Measurement*, Vol. 66 No. 4, pp. 701-716.

Schaufeli, W.B., Salanova, M., Gonzalez-Roma, V. and Bakker, A.B. (2002), "The measurement of burnout and engagement: a confirmatory factor analytic approach", *Journal of Happiness Studies*, Vol. 3 No. 1, pp. 71-92.

Schaufeli, W.B., Taris, T.W. and Van Rhenen, W. (2008), "Workaholism, burnout, and engagement: three of a kind or three different kinds of employee well-being?", *Applied Psychology: An International Review*, Vol. 57 No. 2, pp. 173-203.

Schmitt, N. and Stults, D.N. (1986), "Methodology review. Analysis of multitraitmultimethod matrices", *Applied Psychological Measurement*, Vol. 10, pp. 1-22.

Shimazu, A., Schaufeli, W.B., Suzuki, A., Kosugi, S., Nashiwa, H., Kato, A., Sakamoto, M., Irimajiri, H., Amano, S., Horohata, K. and Goto, R. (2008), "Work engagement in Japan: validation of the Japanese version of the Utrecht Work Engagement Scale", *Applied Psychology: An International Review*, Vol. 57 No. 3, pp. 510-523.

Sonnentag, S. (2006), "Recovery, work engagement, and proactive behavior: a new look at the interface between nonwork and work", *Journal of Applied Psychology*, Vol. 88 No. 3, pp. 518-528.

Torrente, P., Salanova, M., Llorens, S. and Schaufeli, W.B. (2012), "From 'I' to 'We': the factorial validity of a team work engagement scale", in Neves, J. and Gonçalves, S.P. (Eds), *Occupational Health Psychology: From Burnout to Well-Being*, Edições Sílabo, Lisboa, pp. 334-355.

Van Katwyk, P.T., Fox, S., Spector, P.E. and Kelloway, E.K. (2000), "Using the Job-related Affective Well-being Scale (JAWS) to investigate affective responses to work stressors", *Journal of Occupational Health Psychology*, Vol. 5 No. 2, pp. 219-230.

Watson, D., Clark, L.A. and Tellegen, A. (1988), "Development and validation of brief measures of positive and negative affect: the PANAS scales", *Journal of Personality and Social Psychology*, Vol. 54 No. 6, pp. 1063-1070.

Winkler, J.D., Kanouse, D.E. and Ware, J.E. (1982), "Controlling for acquiescence response set in scale development", *Journal of Applied Psychology*, Vol. 67, pp. 555-561.

Further reading

Bakker, A.B., Demerouti, E. and Euwema, M.C. (2005), "Job resources buffer the impact of job demands on burnout", *Journal of Occupational Health Psychology*, Vol. 10 No. 2, pp. 170-180.

Bakker, A.B., Demerouti, E. and Verbeke, W. (2004), "Using the job demands resources model to predict burnout and performance", *Human Resource Management*, Vol. 43 No. 1, pp. 83-104.

Bakker, A.B., Demerouti, E., Taris, T., Schaufeli, W.B. and Schreurs, P. (2003), "A multi-group analysis of the job demands-resources model in four home care organizations", *International Journal of Stress Management*, Vol. 10 No. 1, pp. 16-38.

Billings, D.W., Folkman, S., Acree, M. and Moskowitz, J.T. (2000), "Coping and physical health during caregiving", *Journal of Personality and Social Psychology*, Vol. 79 No. 1, pp. 131-142.

Breevaart, K., Bakker, A.B., Demerouti, E. and Hetland, J. (2012), "The measurement of state work engagement: a multilevel factor analytic study", *European Journal of Psychological Assessment*, Vol. 28 No. 4, pp. 305-312.

Cohen, A.B., Tenenbaum, G. and English, R.W. (2006), "Emotions and golf performance: an IZOF-based applied sport psychology case study", *Journal of Behavioral Modification*, Vol. 30 No. 3, pp. 259-280.

Cronin, M.A., Weingart, L.R. and Todorova, G. (2011), "Dynamics in groups: are we there yet?", *The Academy of Management Annals*, Vol. 5 No. 1, pp. 571-612.

Falk, J.H. and Gillespie, K.L. (2009), "Investigating the role of emotion in science center visitor learning", *Visitor Studies*, Vol. 12 No. 2, pp. 112-131.

Hakanen, J.J., Bakker, A.B. and Schaufeli, W.B. (2006), "Burnout and work engagement among teachers", *Journal of School Psychology*, Vol. 43 No. 6, pp. 495-513.

Hallberg, U.E. and Schaufeli, W.B. (2006), "Same, same, but different? Can work engagement be empirically separated from job involvement and organizational commitment?", *European Psychologist*, Vol. 11 No. 2, pp. 119-127.

Hatfield, E., Cacioppo, J.T. and Rapson, R.L. (1994), *Emotional Contagion*, Cambridge University Press, New York, NY.

Karasek, R.A. (1979), "Job demands, job decision latitude, and mental strain: implications for job redesign", *Administrative Science Quarterly*, Vol. 24 No. 2, pp. 285-308.

Parker, S.K. and Griffin, M.A. (2011), "Understanding active psychological states: embedding engagement in a wider nomological net and closer attention to performance", *European Journal of Work and Organizational Psychology*, Vol. 20 No. 1, pp. 60-67.

Sonnentag, S., Dormann, C. and Demerouti, E. (2010), "Not all days are created equal: the concept of state work engagement", in Bakker, A.B. and Leiter, M.P. (Eds), *Work Engagement: A Handbook of Essential Theory and Research*, Psychology Press, Hove, pp. 25-38.

Sweetman, D. and Luthans, F. (2010), "The power of positive psychology: psychological capital and work engagement", in Bakker, A.B. and Leiter, M.P. (Eds), *Work Engagement: A Handbook of Essential Theory and Research*, Psychology Press, Hove, pp. 54-69.

Ten Brummelhuis, L.L. and Bakker, A.B. (2012), "A resource perspective on the work-home interface: the work-home resources model", *American Psychologist*, Vol. 67 No. 7, pp. 545-556.

Xanthopoulou, D., Bakker, A.B., Demerouti, E. and Schaufeli, W.B. (2007), "The role of personal resources in the job demands-resources model", *International Journal of Stress Management*, Vol. 14 No. 2, pp. 121-141.

Xanthopoulou, D., Bakker, A.B., Demerouti, E. and Schaufeli, W.B. (2012), "A diary study on the happy worker: how job resources relate to positive emotions and personal resources", *European Journal of Work and Organizational Psychology*, Vol. 21 No. 4, pp. 489-517.

About the authors

Patrícia Lopes Costa is a Post-Doctoral Researcher at the ISCTE-IUL. Her research focusses on team effectiveness, namely, on the relevance of affective and motivational interactions between team members for team performance and viability. Patrícia Lopes Costa is the corresponding author and can be contacted at: patricia_costa@iscte.pt

Ana Margarida Passos is an Assistant Professor at the Department of Human Resources and Organisational Behaviour of the ISCTE-IUL. She has a PhD in Social and Organizational Psychology. Her research interests focus on team effectiveness over time and in different contexts.

Arnold B. Bakker is a Professor of Work and Organizational Psychology at the Erasmus University of Rotterdam, The Netherlands. He has worked on the construct of work engagement for over 15 years, and is interested on developing employees' strengths, contributing to effective organizations.