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Measurement of work engagement with single-item measure

Abstract: In recent years, the construct of work engagement as well as methods for its measurement have generated growing interest in the field of occupational psychology. In this study, we aim to contribute to the current work engagement literature by investigating the possible advantages of single-item measures of work engagement by analysing their psychometric feasibility. Testing the validity of a single-item measure tool within the framework of the Job Demands-Resources theory, we have found similar pattern of correlations of single-item measures of work engagement with exhaustion, disengagement, job resources and job demands as for the well-established multi-item measure the Utrecht Work Engagement Scale. The reliability of single-item measures tested with factor analysis and the attenuation formula was estimated to be in the range of between .60 and .70, the figure depending on the particulars of the estimation methods. Our findings provide an initial modicum of evidence that, if a research purpose requires it, or if the use of a multi-item measurement tool is overly restrictive or costly, then a single-item measure of work engagement could be effectively adopted.

Keywords: measurement, work engagement, the UWES, single-item

Work engagement

Even though there is still no overwhelming consensus about how to define and measure work engagement (see Schaufeli & Bakker, 2010; Shuck, 2011; Saks & Gruman, 2014 for a detailed discussion), according to Saks and Gruman (2014), one of the most well-known definitions of work engagement, coupled with its own measurement instrument, comes from Schaufeli et al. (2002). Schaufeli et al. (2002, p. 74) define work engagement as “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption. Rather than a momentary and specific state, engagement refers to a more persistent and pervasive affective-cognitive state that is not focused on any particular object, event, individual, or behaviour”; alongside this definition, a tool to measure work engagement, the Utrecht Work Engagement Scale (UWES) has also been developed. In its first version, UWES had 17 items (Schaufeli et al., 2002), then a shortened version of UWES consisting of

9 items was introduced (Schaufeli, Bakker, & Salanova, 2006), and lastly, a reliable and valid, ultra-short version of UWES, comprised of only 3 items, has recently been created (Schaufeli, Shimazu, Hakanen, Salanova & De Witte, 2017). UWES, as with all types of self-descriptive psychological measures, is not immune from criticism concerning: its factorial validity (Mills, Culbertson, Fullagar, 2012), its redundancy in relation to job burnout (Cole, Walter, Bedeian, & O’Boyle, 2011), and its overlap with other well-known measures from the field of organizational psychology such as job satisfaction or organizational commitment (Newman & Harrison, 2008; Viljevac, Cooper-Thomas, & Saks, 2012; Wefald, Mills, Smith, & Downey, 2012). However, despite these reservations, UWES has become a ‘gold standard’ for work engagement measurement and, in most contemporary research, work engagement is operationalized via the UWES score (Saks & Gruman, 2014).

In recent years, work engagement measurement has attracted special attention in the fields of psychology,

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management and occupational medicine, thanks to its links to employee performance (Reijseger, Peeters, Taris, & Schaufeli, 2017), health (Seppälä et al., 2012) and well-being (Innstrand, Langballe, & Falkum, 2012). Given that interest in the measurement of work engagement has grown both in academia and business, this study seeks to test the feasibility of an alternative method of work engagement measurement, namely, single-item measurement.

Is there any necessity for a single-item measure of work engagement?

In our estimation, there are important practical and theoretical considerations prompting an investigation into the utility of single-item work engagement measures. The most intuitive advantages of using single-item measures are: economisation in research costs, the shortening of survey lengths, a decrease in participant refusal rates, a reduction in the time taken to complete a survey, an increase in participant motivation to complete a survey by lessening its monotony, and the greater opportunity to enquire into a larger number concepts within a single research study. Thus, using a single-item measure of work engagement might allow for the collection of work engagement data in a more economical and effective way, which might be of especial importance in applied settings.

Single-item measures of work engagement might also be more appropriate in panel studies and longitudinal research projects, for instance, *Baltimore Longitudinal Study of Aging*, *National Longitudinal Surveys*, or in the case of Poland, *Social Diagnosis*, which currently, as far as is known, seems to overlook work engagement. Panel studies pave the way for more robust psychological findings, but typically this category of research project investigates a myriad of variables, and the addition of any new question is invariably given careful consideration. Thus, the potential use of single-item measures might facilitate the introduction of work engagement into longitudinal research projects without drastic increases in costs and total survey length.

An added benefit associated with a single-item measure of work engagement is the opportunity to introduce methodologies which might otherwise be more complex if carried out using long multi-item measures, such as the experience sampling method (Csikszentmihalyi & Larson, 2014). Combining the single-item measurement with experience sampling methods might make possible the analysis of fluctuations in work engagement over longer periods; for example, by asking employees to briefly assess their momentary work engagement on a single scale over the course of a random selection of work days.

Yet another factor encouraging the use of single-item measurement is the inexorable rise of Internet-based research, or Smartphone studies, which provide new research opportunities in terms of the heterogeneity of samples and the access to thousands of respondents, but which frequently require the use of measurement methods that are deployed in as brief a time as possible.

Last but not least, using a single-item measure might lead to improved standardization in work engagement research both in academia and business. Nowadays, in order to measure work engagement, researcher/organization A may use a measure from consulting firm X, researcher/organization B may use a measure Y drawn from the scientific literature, and researcher/organization C may use a self-developed measure, Z. These three entities might label what they are measuring 'work engagement', but whether the same feature is being measured in each case is a matter of some serious doubt. In contrast, the use of the same standardized, free-to-use and easy-to-implement single-item measure might facilitate the gathering of comparable results across various measurement samplings. From a theoretical perspective, greater standardization in work engagement measurement might lead to a better understanding of this phenomenon. From a practical point of view, improved standardization of measurement methods might engender more precise work engagement benchmarking across diverse companies or industries.

Although it is commonly assumed that multi-item measures outperform single-item ones, Jordan and Turner (2008) suggest that a single-item measure might offer some advantages. It might establish higher face validity by clearly stating an issue in a question, and this might create an understanding of the research topic among participants, possibly motivating them to complete the survey at hand. Single-item measures might provide a more accurate assessment of general constructs, and thus might increase the validity of the construct being researched. The use of single-item measures might also reduce common-method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) as the use of a single-item measure reduces the numbers of items with a similar response format and question wording in a survey (Jordan & Turner, 2008).

Work engagement: a single- or multidimensional construct?

One of the most challenging aspects of measuring work engagement with single-item measures might be that work engagement is defined as a multifactor construct, so it would seem to follow that a single-item measure could not provide a good representation of a multidimensional construct. The definition of work engagement put forward by Schaufeli et al. (2002) states that work engagement consists of three dimensions: vigor, dedication and absorption; however, the dimensionality of work engagement is somewhat unclear (Viljevac, Cooper-Thomas, & Saks, 2012). Schaufeli, Bakker and Salanova, (2006) in their article introducing UWES-9, overtly suggest that both the three-factor and one-factor structure of work engagement might be utilized in research studies. This conclusion was based on the finding that a one-factor structure of work engagement presented a reasonable fit to the data in confirmation factor analysis. Secondly, the correlations between the 'separate' dimensions of work engagement were high. Thirdly, the internal consistency of the overall scale consisting of all

nine items was also very high. Thus, Schaufeli, Bakker and Salanova (2006, p. 712) conclude that: “*So, practically speaking, rather than computing three different scores (...) researchers might consider using the total nine-item score as an indicator of work engagement*”. Echoing this, Hallberg and Schaufeli (2006, p. 123) claim that “*(...) the one-dimensional representation and the three-dimensional representation of work engagement are equivalent. However, the latent intercorrelations, ranging between .88 and .99 (see Table 5) indicate a substantial overlap between the different aspects of work engagement, which could be interpreted in favour of the one-dimensional approach*”. In a similar vein, Seppälä et al. (2009, p. 476) have found that: “*(...) work engagement can be considered both as a one-dimensional and as a three-dimensional construct, depending on the research purpose*”. Finally, Littman-Ovadia and Balducci (2013, p. 61) state that: “*(...) work engagement as measured by the UWES-9 may be conceptualized in terms of the three correlated factors of Vigor, Dedication, and Absorption. However, the high intercorrelations between factors suggest that they can hardly be differentiated in practical terms, which means that an overall measure of work engagement can also be justified*”. Adding further weight to this conclusion, in the report *Work Engagement in Europe* (Schaufeli, 2017) and also through the introduction of UWES-3 (Schaufeli, Shimazu, Hakanen, Salanova, & De Witte, 2017), work engagement has been measured as a one-dimensional construct represented by one general score.

To sum up, it seems that the currently available research studies provide evidence that work engagement can indeed be measured via both a multi-dimensional and one-dimensional construct (see Kulikowski, 2017). The use of a single general score for work engagement could be more appropriate when using multiple regression in order to avoid multicollinearity (Schaufeli, Bakker, & Salanova, 2006). In practical terms, it could also be more applicable when a research question addresses a state of general work engagement, whereas using separate dimensions might be reasonable only for structural equation modelling (Seppälä et al., 2009). Given these various justifications for the notion that work engagement can be measured as a one-dimensional construct, it seems reasonable to posit that a single-item measure is of potential use in the representation of a state of general work engagement. This state of general work engagement can be defined as “*persistent and pervasive affective-cognitive state that is not focused on any particular object, event, individual, or behaviour*” (Schaufeli et al., 2002, p. 74). Moreover according to Schaufeli, Shimazu, Hakanen, Salanova and De Witte (2017) work engagement as a general construct is a unitary construct that is constituted by three closely related aspects: energy (vigor), feeling of a sense of work significance and challenge (dedication) and deep concentration on work (absorption). These three aspects of work engagement do not create separated dimensions, but it is rather a combination of vigor, dedication and absorption that constitutes general work engagement (Schaufeli, 2013). This operational definition is supported by a wide

body of research showing a validity of unidimensional structure of work engagement (for review see Kulikowski, 2017) and also nicely summarized by empirical findings by de Bruin and Henn (2013): “*(...) the results show that failure to model the group factors leads to little distortion in the definition of the general Work Engagement factor. Put differently, the meaning of the general factor remains constant, with or without the group factors*” (de Bruin & Henn, 2013, p. 796). In short, general work engagement can be defined as a persistent and pervasive affective-cognitive work-related positive state of mind in which work vigor, work dedication, and work absorption interpenetrate each other and merge creating general work engagement.

Single-item measures of work engagement

As the deployment of single-item measures of work engagement seems not to be without merit on conceptual grounds, and in fact, may confer numerous advantages to research design, the main aim of this study is to answer the question of whether we can use single-item measures to reliably and validly measure work engagement. We intend to address this question by comparing one of the most widely used multi-item work engagement measures, UWES, to a single-item measure of work engagement. To gain more insight, we decided to compare a single-item measure of work engagement with three different versions of UWES. First of all, UWES-9, as it is most often used to measure work engagement (Schaufeli, Bakker, & Salanova, 2006); next, UWES-6, consisting only of vigor and dedication subscales, which has shown some advantages over UWES-9 in contexts in Poland (Kulikowski, 2017); and lastly, UWES-3, a newly developed ultra-short measure of work engagement (Schaufeli, Shimazu, Hakanen, Salanova, & De Witte, 2017).

To estimate the reliability of a single-item measure of work engagement, we follow the recommendation of Wanous and Hudy (2001) for the use of two methods: (a) the correction for attenuation formula, and (b) item communalities from factor analysis (we use the principle axis method), for when multi-item measures items are introduced together with single-item measures (for details see: Wanous & Hudy, 2001; Jordan & Turner, 2008). Both of these methods need multi-item measures as a reference point, so we chose scores from UWES as a well-established multi-item measure of work engagement. Moreover, when using the correction for attenuation formula, it is necessary to assume a true correlation between the constructs being measured by multi-item and single-item measures. In our study, in order to err on the side of caution, we assumed three possible correlations: 1/.9/.85.

To test the validity of a single-item work engagement measure, we applied Job Demands-Resources theory (JD-R) (Bakker & Demerouti, 2017), one of the most meaningful contemporary theories explaining work engagement. In general, this theory postulates that work characteristics related to work engagement can be classified into one of two categories: job demands and job resources. Job resources are the most important predictors of work

engagement, whereas job demands are predictors of burnout. Hence, we (1) compared the relationship between multi-item measures (UWES) and single-item measures, with regards to (1a) job demands and job resources, (1b) job burnout. In addition, we (2) tested the feasibility of single-item measures in the motivational process described by JD-R theory in which job resources predict work engagement. Since this motivational process has been confirmed in many research studies (Bakker & Demerouti, 2017), investigating whether single-item measures might be used as an explanatory variable within the framework of JD-R theory could act as a critical test of its validity. Throughout the study, we operate under the assumption that similar patterns of correlations among single-item and multi-item measures of work engagement indicate single-item measure validity as a measurement instrument.

Measures and procedure

The data under analysis was collected as part of a research project devoted to gaining a better understanding of the phenomenon of work engagement by investigating the link between employee cognitive functioning and work engagement. During the research procedure, participants completed a set of working memory and fluid intelligence tests as well as surveys on job demands, job resources, burnout and work engagement. Additionally, at the end of the study, participants were presented with a single-item measure of work engagement and single-item measure of job burnout. Detailed information concerning the research procedure is available upon request from the author. In the present study, we analyzed data solely related to the question of the feasibility of single-item measures of work engagement. Other data collected which is not pertinent to this paper will be analyzed elsewhere.

Participants

In this research project, 400 volunteers were recruited through ads placed on internet portals, and each participant received a reward of approximately €12. To take part in the study, each participant was required to present documents confirming employment status. Finally, after a data cleaning procedure, a total of 383 records (66% women) were obtained; the mean age was 30.4 (SD 7.8); the mean of current work tenure was 3.6 years (SD 4.6), and the mean monthly net wage was 2219 PLN (approx. €515) (SD 915 PLN); 289 (75.5%) participants were working on a job contract, while 94 (24.5%) were working on other forms of job agreement. Among the participants, 261 (68.2%) had a university degree, and 122 (31.8%) had a lower level of education; 240 (62.6%) position in their organization might be described as specialist or managerial, and 143 (37.4%) as ordinary worker.

Measurement

To measure work engagement with a single-item measure, we introduced the widely-used single-item measurement method called Cantril-ladder (Glatzer & Gulyas, 2014). Participants using an 11-point response scale (ladder)

answered the following question: "Please take a look at the scale below. The bottom of the scale rating 0 – represents the lowest possible level of work engagement, the top of the scale rating 10 – represents the highest possible level of work engagement. Please select on this scale a number representing your level of engagement in your work".

Multi-item work engagement was measured with a shortened version of the Utrecht Work Engagement Scale (UWES-9). The UWES-9 questionnaire consists of nine questions designed to capture: vigor (e.g. 'At my work, I feel bursting with energy'), dedication (e.g. 'I am enthusiastic about my job'), and absorption (e.g. 'I am immersed in my work'). The subjects answered on a 7-point frequency scale, ranging from 0 = never to 6 = always/every day. Furthermore, to gain fuller insight into the multi-item measure of work engagement from the results of UWES-9, we computed scores in UWES-6 and UWES-3. The UWES-6 score consists of only six questions representing vigor and dedication, and the UWES-3 consists of three questions – one from each of the three UWES-9 dimensions (Schaufeli, Shimazu, Hakanen, Salanova, & De Witte, 2017).

Burnout was measured with the Polish version of the Oldenburg Burnout Inventory (OLBI) (Baka & Basińska, 2016). This scale measures two dimensions: exhaustion (a sample item is: 'After my work, I usually feel worn out and weary'), and disengagement (a sample item is: 'I happens more and more often that I talk about my work in a negative way'). There were eight items in each subscale, with the items being scored on a four-point Likert scale, ranging from 1 = totally disagree to 4 = totally agree.

Job resources. To assess the level of co-worker support and supervisory support we used items from the Polish version of the Karasek Job Content questionnaire (Żołnierczyk-Zreda & Bedyńska, 2014). To measure performance feedback, we used three items based on feedback from another scale (Morgeson & Humphrey, 2006), (a sample item: 'I receive information about the quality of my work'). All job resources items were scored on a 4-point Likert scale ranging from 1 = totally disagree to 4 = totally agree.

Job demands. We measured organizational constraints with four items from the Polish version of the Spector and Jex organizational constraints scale (Baka & Basińska, 2016); (a sample item: 'How often do you find it difficult or impossible to do your job because of poor equipment or supplies?'). Negative work-home interaction (Geurts et al., 2005) was measured with a four-item self-constructed short negative work-family conflict scale, (a sample item: 'How often do you have too little time for people close to you because of your work?'). Emotional demands were measured using a four-item self-constructed general emotional demands scale. Two items were created based on the Xanthopoulou, Bakker and Fischbach (2013) emotional demands scale, and two items were newly developed (a sample item: 'How often do you face emotionally charged situations in your work?'). All job demands items were scored on a 5-point frequency scale ranging from 1 = less than once per month or never, to 5 = several times per day. All scales used in this study present good

psychometric properties demonstrated by theoretically expected patterns of correlation with other scales used in this study, and good reliability (see Table 1).

Results

Descriptive analysis

Mean, standard deviation, reliabilities and correlations for all measures used in this study are presented in Table 1.

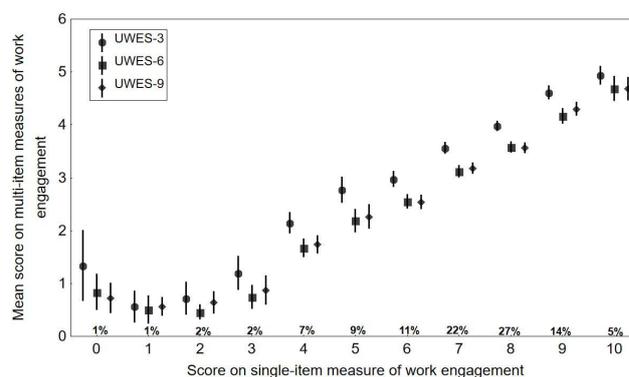
From Table 1, it can be seen that all of the measured variables present quite good reliability as represented by Cronbach's alpha coefficient. Furthermore, there is a theoretically expected pattern of correlation between the constructs measured i.e. job demands negatively correlate with work engagement and job resources, while job resources positively correlate with work engagement, and negatively with job demands.

The Pearson correlation between single-item and multi-item measures of work engagement is statistically significant ranging from .69 to .7 and can be judged as moderate to strong i.e. supporting a strong correlation between both types of measures. Additionally, we computed Spearman rank correlations of multi-item and single-item measures resulting in .65 for UWES-3, .65 for UWES-6 and .67. for UWES-9, not far from Pearson correlation estimates.

The results obtained from the single-item measure might be seen as a categorical variable forming eleven groups of results (from 0 to 10). Thus, to gain more insight into the relationships between multi-item and single-item measures of work engagement, we have plotted the mean scores in multi-item measures for groups of participants

choosing each of the eleven options on the single-item measure scale. This might yield more detailed insights than mere correlation coefficients. This analysis is depicted in Figure 1. Thanks to this sort of examination of the data, we are in a better position to ascertain how scores on a single-item measure and multi-item measures correspond to each other. Additionally, Figure 1 presents a percentage

Figure 1. Mean scores on three types of multi-item measures of work engagement using the Utrecht Work Engagement Scale (UWES) among groups of employees with scores ranging from 0 to 10 on a single-item work engagement measure, vertical lines represent standard errors.



Note. The percent figure placed on the horizontal axis represents the percentage of participants choosing each given option on the single-item measure from among the total number of participants, 100% = 383, due to a rounding percentages not add up to 100%.

Table 1. Mean standard deviation, reliabilities and correlations for the analyzed variables

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Co-worker support	2.94	0.46	0.75											
2. Supervisor support	2.62	0.60	0.43	0.78										
3. Performance feedback	2.76	0.61	0.34	0.45	0.75									
4. Emotional demands	2.96	1.15	-0.07 ^{ns}	-0.18	-0.06 ^{ns}	0.87								
5. Occupational constraints	2.12	0.86	-0.17	-0.31	-0.16	0.50	0.72							
6. Work-home interaction	1.93	0.85	-0.20	-0.24	-0.11	0.48	0.47	0.84						
7. Exhaustion OLBI	2.48	0.52	-0.34	-0.40	-0.33	0.35	0.40	0.53	0.83					
8. Disengagement OLBI	2.59	0.53	-0.37	-0.46	-0.34	0.16	0.28	0.23	0.65	0.81				
9. UWES 3	3.53	1.34	0.31	0.39	0.25	0.07 ^{ns}	-0.14	-0.03 ^{ns}	-0.45	-0.69	0.78			
10. UWES 6	3.10	1.37	0.36	0.42	0.30	-0.02 ^{ns}	-0.26	-0.14	-0.58	-0.79	0.90	0.90		
11. UWES 9	3.15	1.34	0.34	0.41	0.27	-0.01 ^{ns}	-0.21	-0.11	-0.55	-0.79	0.92	0.98	0.92	
12. Single-item	6.97	1.91	0.28	0.38	0.33	0.01 ^{ns}	-0.21	-0.13	-0.42	-0.61	0.69	0.69	0.70	-

Note. OLBI = Oldenburg Burnout Inventory; UWES = Utrecht Work Engagement Scale; all coefficients are significant $p < .05$ except those marked ns, alpha Cronbach reliabilities on diagonal.

distribution of participants choosing each option on a single-item measure.

Visual analysis of Figure 1 gives rise to interesting observations. Firstly, a relatively small number of participants chose the options from the lower part of the single-item measure: 94% of participants assessed their work engagement as higher than 3. In other words, on an 11-point scale, the four lower options (from 0 to 3) were rarely chosen. Then, in Figure 1, we can see that, starting from the number 4 point on the scale on the single-item measure, mean scores in multi-item measures trend upwards as the score on the single-item measure increases. Employees scoring from 0 to 3 on the single-item measure seem to indicate a low level of work engagement, and similar scores can be seen on multi-item measures. Finally, it is worth noticing that all of the three types of multi-item measures of work engagement perform comparably across groups of single-item measure scores. This lends further support to the comparable validity of all three types of UWES; this is a notable finding, especially for UWES-3, since this measure has not previously been tested with Polish employees, to the best of our knowledge.

Reliability of single-item measure of work engagement

A detailed analysis of the reliability of the single item-measure of work engagement is presented in Table 2. Its reliability was estimated using attenuation formula ranges from .53 to .85, and estimated using factor analysis with ranges from .53 to .60, depending on the multi-item measure adopted as a reference point, and with an assumption of true correlation between single-item and multi-item measures of work engagement. The average reliability across different methods of estimation presented in Table 2 is about .64.

Table 2. Estimates of single-item work engagement measure reliabilities

Reference point multi-item measure	Estimation method		Average
	Attenuation formula*	Factor analysis communalities	
UWES-9	.54/.66/.74	0.53	0.62
UWES-6	.53/.65/.73	0.52	0.61
UWES-3	.61/.76/.85	0.60	0.71

Note. * estimated reliability depends on the assumed underlying true construct correlation between reference point multi-item measures and the single-item measure; three correlations were tested: 1/.9/.85, UWES – Utrecht Work Engagement Scale.

When computing single-item measure reliability based on the attenuation formula, it is necessary to refer to a multi-item measure with known reliability estimates and adopt a magnitude of true correlation between constructs measured by a single-item measure and multi-item measures. Following Wanous and Hudy (2001), we postulate that it might be sensible to expect that the true

correlation between the constructs underlying a single-item measure and multi-item measures will not be perfect. The main reason for this is that multi-item measures will always be weaker in comparison to single-item measures when capturing a general construct (Wanous & Hudy, 2001). This is due to the fact that when a single question is posed to directly enquire about overall work engagement level, the participant is required to assess his/her overall work engagement level. In contrast to this, multi-item measures aim to produce an overall work engagement score by summing a set of items, none of which refers explicitly to work engagement. Thus, to expect a perfect correlation of 1 between the measured constructs is unrealistic; a more pragmatic assumption would be .9 or .85. Taking all of this into account, based on the findings presented in Table 2, in this study the reliability of the single-item measure of work engagement is safely estimated to be between .60 and .70.

The validity of a single-item measure of work engagement

To test the validity of a single-item measure of work engagement, using JD-R theory as a conceptual basis, the rationale here is that for a valid single-item measure of work engagement, we might be expected to find a similar pattern of Spearman rank correlation with job demands and job resources to that of well-established multi-item measures i.e. UWES. To clearly highlight any possible disparities (with regards to job demands and job resources) between single-item and multi-item measures of work engagement, we subtracted values of the correlation coefficient for multi-item measures from values of the correlation coefficient for the single-item measure. This allows us to quantify the absolute differences in the relationship between single- and multi-item measures for job demands and job resources. These analyses are presented in Table 3.

As can be seen in Table 3, the multi-item measures and single-item measures of work engagement present similar and, from a JD-R theoretical perspective, expected patterns in relation to job demands and job resources. The absolute differences between correlations for multi-item and single-item measures are rather small, ranging from .01 to .09, and thus support the validity of single-item measures.

The second test of validity of the single-item measure of work engagement was the comparison of single- and multi-item measures in terms of two dimensions of job burnout: exhaustion and disengagement. The results of this analysis are also presented in Table 3. Single-item and multi-item measures of work engagement present negative and statistically significant correlations with the dimension of job burnout, and again, this is a theoretically expected pattern. Correlations with job burnout for multi-item measures were larger in magnitude than for single-item measures, with the absolute difference in correlations between single-item and multi-item measures ranging from .06 to .24. However, overall it appears that this finding is congruent with predictions based on JD-R theory concerning the negative relationship between burnout

Table 3. Comparison of Spearman rank correlations of multi-item and single-item measures of work engagement with job demands, job resources and job burnout

	UWES-3	UWES-6	UWES-9	Single-item
Job resources				
Co-worker support	.29 (.03)	.35 (.09)	.33 (.06)	.27
Supervisor support	.35 (.02)	.40 (.07)	.38 (.05)	.33
Performance feedback	.23 (.08)	.29 (.01)	.26 (.04)	.30
Job demands				
Emotional demands	.10 (.04) ^{ns}	-.01 (.07) ^{ns}	.00 (.06) ^{ns}	.06 ^{ns}
Occupational constraints	-.11 (.03)	-.23 (.08)	-.18 (.04)	-.14
Work-home interaction	-.02 (.09) ^{ns}	-.13 (.02)	-.10 (.01)	-.11
Job burnout				
Exhaustion	-.42 (.06)	-.57 (.21)	-.54 (.18)	-.36
Disengagement	-.65 (.11)	-.78 (.24)	-.78 (.24)	-.54

Note. Absolute difference between correlations for multi-item and single-item measurement in brackets. All coefficients are significant on $p < .05$ except those marked ns.

and work engagement, and again bolsters support for the validity of a single-item measure of work engagement.

To further test the validity of a single-item measure of work engagement, we constructed a structural equation model with latent variable job resources created with three indicators: supervisor support, co-worker support and performance feedback, acting as predictors of work engagement. This model is based on the robust, empirically established motivational processes outlined in JD-R theory which, in short, states that job resources predict work engagement (Bakker & Demerouti, 2017). We wished to compare how a single-item measure performs in such a structural equation model in comparison to multi-item measures. As we can see in Table 4, latent job resources predict work engagement as measured by both the single-item measure (standardized regression weights $\beta = .51$) and by the multi-item measures (UWES-9 $\beta = .53$; UWES-6 $\beta = .56$; UWES-3 $\beta = .50$). Job resources account for about 26% of the variance in the single-item measure of work engagement, and from 25% to 31% of variation in

work engagement as captured by multi-item measures. Fit indices: GFI, NCFI, CFI, and RMSEA suggest a acceptable and comparable model fit for all of the tested models, including the single-item measure (Schreiber, Nora, Stage, Barlow & King, 2006). These findings again underpin the validity of single-item measures within the framework of the JD-R theory.

Discussion

The major concern of many researchers regarding a single-item measurement tool is its reliability; however, Wanous and Hudy point out that this concern is somewhat unjustified (2001, p. 374): “Unfortunately, too many people have assumed two things about single-item measures: (a) that the reliability of single-item measures cannot be estimated, and (b) that the reliability would be unacceptably low, if it could be estimated. When it comes to the reliability of single-item measures of work engagement, we estimate it to be somewhere between .60 and .70 (see

Table 4. Four structural equation models, in which job resources account for work engagement, as measured by single-item or multi-item measures

Model	β	R^2	χ^2	p	GFI	NFI	RMSEA 90
job resource → single-item	.51	.26	.4	.818	.999	.998	.000–.061
job resource → UWES-9	.53	.28	2.1	.341	.997	.992	.000–.103
job resource → UWES-6	.56	.31	1.7	.434	.998	.994	.000–.096
job resource → UWES-3	.50	.25	1.6	.441	.998	.993	.000–.095

Note. job resources = latent factor consisting of supervisor support, co-worker support, and performance feedback; UWES = Utrecht Work Engagement Scale; RMSEA 90 = two-sided 90% confidence interval for the population RMSEA; GFI = Goodness-of-fit index; NFI = Normed fit index.

Table 2), a value which, admittedly, is not extremely high but, on the other hand, definitely not unacceptably low. Moreover, this reliability figure parallels one which has been found for single-item measurement of job satisfaction (Wanous, Reichers, & Hudy, 1997), a concept similarly related to work engagement, representing as it does an aspect of work-related well-being. All in all, it is also difficult to definitively state what degree of reliability is to be deemed sufficient for a single-item measure (Postmes, Haslam, & Jans, 2013); how satisfactory the reliability of a measure is also depends on how it is being used (Drost, 2011) rather than whether it passes a precise reliability threshold. In our view, instead of seeking a ‘satisfactory’ threshold for the acceptable reliability of a single-item measure, it might be much more advisable to see reliability as simply supplying information about the ratio of true score variance to the total variance of test scores, informing us about the magnitude of measurement errors, instead of seeing it as a categorical variable with just two values: acceptable/not acceptable. This would counter a common and very human tendency to look for simple binary yes/no answers on complicated questions of reliability, a tendency which can be a source of misconceptions and “legendary” rules of thumb (for details see: Lance, Butts, & Michels, 2006). To reiterate, the reliability of a single-item measure of work engagement, as gauged in our study, ranged from .60 to .70. This is a modest level of reliability so it is clear that there remains a certain degree of error in this type of measurement; however, in our opinion, as part of particular research designs, single-item measures, despite their lesser reliability, can still provide us with useful information.

When we analyzed the validity of single-item measures of work engagement, this analysis was based on the well-established theoretical framework of JD-R theory. Firstly, it can be noted (see Table 3) that a single-item measure of work engagement performs comparably to multi-item measures in relation to the assessment of perceived job demands and job resources. Co-worker support, supervisor support and performance feedback are positively and correspondingly related to scores in both single- and multi-item measures of work engagement. Also, occupational constraints, work-home interactions, and emotional demands were related to work engagement in a comparable fashion, regardless of measurement method, whether single- or multi-item. Moreover, latent variable job resources (constructed from: co-worker support, supervisor support and performance feedback) quite similarly predict work engagement in the structural equation model, whether it was quantified via single- or multi-item measurements (see Table 4). Additionally, when we tested the relationship between single- and multi-item measures with the burnout dimensions of exhaustion and disengagement, we generally found a similar pattern for both types of work engagement measures, even though the link to burnout for multi-item measures of work engagement was slightly larger in magnitude than for a single-item measure. Taken together, it seems that our findings give some initial support for the position that a single-item measure might be a valid work engagement measure as undergirded by JD-R theory.

Our findings seem to favour an acceptance of single-item measures of work engagement when the research questions and/or design are conducive to this kind of measurement. We are of the view that, for the purposes of various practical and theoretical research problems discussed in details in introduction part of this article, e.g. longitudinal panel studies, Internet or Smartphone research, experience sampling method, highly time and cost consuming research projects, pilot or exploratory studies, a single-item measure of work engagement might provide us with useful information, reduce uncertainty, as well as lead to the reduced expenditure of time, money and effort. Having said this, although single-item measures possess a degree of utility in certain research contexts, we should bear in mind that multi-item measures of work engagement, such as UWES, probably perform better than single-item ones in most research contexts. We are therefore not in favour of opting for the replacement of multi-item measures by single-item ones across the board, but instead, we recommend that if a research purpose requires it, or if the use of a multi-item measurement tool is overly restrictive, then a single-item measure of work engagement might be adopted. However, the decision concerning any methodology of measurement of work engagement ought always to derive from in-depth theoretical considerations, and the actual research aims.

On the whole, it seems that our results provide the first pieces of evidence for the feasibility of single-item measurements of work engagement as a measurement tool in work and organizational psychology contexts. It is of note that the acceptable psychometric properties of single-item measures have already previously been provided for a variety of psychological constructs, namely: organizational justice (Jordan & Turner, 2008), job satisfaction (Wanous et al., 1997; Dolbier et al., 2005), life satisfaction (Cheung & Lucas, 2015), stress (Elo et al., 2003), social identification (Postmes et al., 2013), fatigue (Van Hooff et al., 2007) and self-efficacy (Hoepfner, Kelly, Urbanoski, & Slaymaker, 2011), among others. As a result of this study, it now appears that work engagement is yet another construct which might be reasonably well captured by single-item measurements.

Limitation and further research

Our study is not free from limitations. First of all, it was conducted with the use of the convenient sampling of volunteers. Although there is no theoretical reason to predict that single-item measurement captures work engagement among the participants of our study differently than it would among employees who did not take part, further research would need to be conducted on a larger and more representative random sample to confirm the validity of our findings. The second limitation is the fact that a relatively small number of participants chose low-ranking scores on the single-item scale; this suggests that in future research, it might be desirable to shorten the response scale e.g. from 11 to 7 response options. Thirdly, our single-item measure directly asks participants to assess their work engagement level, whereas in multi-item UWES there is

no direct reference to work engagement, and subjects are not made explicitly aware that what is being measured is their work engagement level. The direct question for self-assessment of work engagement might have both benefits (Jordan & Turner, 2008) and side effects. Among the benefits that might be considered is the potential increase in motivation to answer a well-understood question with a clear purpose, and the opportunity to capture the general construct of work engagement as seen by employees themselves. However, a possible side effect of such a direct enquiry concerning work engagement is that it could lead to the inflation of work engagement scores if employees felt that the results of the measurement might have an impact on them personally. This inflation might arise if, for example, employees held the belief that their individual or team work engagement score might affect their future work rewards or promotion. In light of this, it is important to be aware that our study was a fully anonymous academic research project, conducted outside the context of any particular organization. Thus, participants almost certainly had no motivation to inflate their true work engagement level as their scores would never be presented in any way to their employers. Therefore, our study provides some evidence for the feasibility of a single-item measure of work engagement in research studies conducted on a multilocational sample, outside the context of any particular organization e.g. panel studies on general population. Nevertheless, in future research of this kind, it might be desirable to replicate our findings in the context of a homogenous group from the same organization.

Other fruitful line of research might be also an analysis of the meaning of the general work engagement construct in a qualitative study. An operational definition of general work engagement (Schaufeli, Shimazu, Hakanen, Salanova, & De Witte, 2017) constitutes a reference point for validity testing in this paper, based on in-depth interviews (Schaufeli et al., 2002) and was inspired by ethnographic perspective of personal engagement submitted by Khan (1990) (see: Schaufeli & Salanova, 2007). However, it might be a worthwhile attempt to scrutinize how employees see, perceive and understand the concept of general work engagement in further qualitative study (see: Gioia, Corley, & Hamilton, 2013).

In short, single-item measurement tools are not free from limitations, and more research is called for on this topic; still, it is the opinion of the author that they might be successfully used in a variety of research contexts, and we anticipate that the work presented here might spur further debate on the role of single-item measurement of work engagement in the field at large and a meaning of work engagement.

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