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great by
deeds, not by
birth"

-Chanakya

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Validation of a Quick Engagement Inventory (QEI-9)¹

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Abstract

The nine items Utrecht Work Engagement Scale (UWES-9, Schaufeli, Bakker & Salanova, 2006) is arguably the most popular instrument in academic literature for assessing the construct of work engagement. However, several limitations of the measure have come to light, especially on its factor structure and construct validity. In response to these limitations, through this research we attempt to develop a nine item measure of work engagement named Quick Engagement Inventory (QEI-9). Towards that three studies are reported. We found acceptable evidence for convergent validity, discriminant validity, nomological validity and internal consistency reliabilities of the measure. The relevance and limitations of this work is also discussed.

Keywords: Scale development, Work Engagement, UWES-9, QEI-9, Vigor, Absorption, Dedication

Introduction

Research has shown that engaged employees are healthy, productive and have positive family life and manager-employee relations (Harter et al, 2002; Salanova et al, 2008). An engaged workforce is positively associated with better use of resources, including fewer quality errors, superior customer service, greater sales growth and higher earnings per employee (Harter et al., 2002; Bates, 2004; Xanthopoulou et al., 2009). However, despite organizations' continued efforts to strengthen engagement levels of their employees, and continuous deployment of resources and effort to foster engagement at work, the employees of today's organizations are hardly an engaged lot (Gallup 2013)⁵ and the practitioner literature is replete with concerns about a disengaged workforce (LaMotte, 2015; Graber, 2015; Harter & Adkins, 2015). This phenomenon has thus spurred wide research on work engagement and has garnered increased attention of research scholars.

In academic literature, previous work on this topic, has centered around four distinct themes – the Role Theory approach (Kahn, 1990; May et al, 2004), the Social Exchange Theory approach (Saks, 2006), the Empowerment approach (Pati & Kumar, 2010; Pati, 2012) and the Burnout theory approach (Schaufeli et al, 2002). Measurement instruments based on the above conceptualization have been developed and five main measures published in the scholarly literature are those by May et al (2004), Schaufeli et al (2002), Rich et al (2010), Pati (2012) and Saks (2006). Of these the UWES scale by Schaufeli et al (2002) and its nine item version (UWES-9, Schaufeli, Bakker & Salanova, 2006), which assess work engagement on the three dimensions of *vigor*, *dedication* and *absorption*, remains one of the most frequently used (Sonnentag 2003, 2011; Salanova & Schaufeli, 2008; Xanthopoulou et al., 2009).

The frequent use of UWES as a psychometric instrument, however, has two main challenges. First, the repeated use of an oft-used scale carries the risk of researchers ignoring issues of scale reliability and validity (Ryan & Ployhart, 2000). Second, the scale itself has been the subject of considerable debate. The dimensionality of the scale has been inconclusive with several studies reporting conflicting results. Researchers have raised concerns whether work engagement can be construed as a unidimensional construct (Rothmann et al., 2011; Shimazu et

⁵ Gallup's 142-country study on *State of the Global Workplace* in 2013 has reported that for the year 2011-12 only 13% of the employees worldwide are "highly engaged" and 24% are "actively disengaged" at work.

al., 2008; Sonnentag, 2003; Storm & Rothmann, 2003; Alok, 2013), as three separate (but correlated) dimensions i.e. *vigor*, *dedication* and *absorption* (Schaufeli et al, 2002), as a bi-factor concept comprising of one main dimension and two or more sub-dimensions (Reise et al., 2007; De Bruin & Henn, 2013) or as a two-factor interpretation (Naudé & Rothmann, 2004; Nerstad et al., 2010), for example, comprising of *absorption* and *vigor* or *dedication* (Viljevac et al, 2012).

Further, several items in UWES seem ambiguous or improperly worded. Studies have suggested improvements in the item wordings (Storm & Rothmann, 2003; Rich et al., 2010). E.g. ITEM-2 of the UWES-9 (“At my job, I feel strong and vigorous”) simultaneously explores two attributes - ‘strong’ & ‘vigorous’. Similarly ITEM-5 (“When I get up in the morning, I feel like going to work”) may not apply to all professions, especially employees working in alternate time-shifts such as Indian BPO workers. Another drawback of UWES cited by scholars is the high correlations among the three dimensions (DeBruin et al, 2013; Christian & Slaughter, 2007, Storm & Rothmann, 2003) with suggestions to use a composite unidimensional score of UWES rather than three separate scales for the dimensions of *vigor*, *dedication* and *absorption* (Schaufeli et al, 2006; Christian & Slaughter, 2007). Finally, the performance of UWES measure across cultures has not been rigorously demonstrated. Goliath-Yarde & Roodt (2011) have found difficult to interpret words and idiomatic expressions in the item wording to be a probable cause of differences in the engagement scores between cultural groups at the item level. Alok (2013) has suggested that culture could be the reason behind the variation in the factor structures of UWES across countries i.e. a three-factor structure was observed in Europe (Balducci et al., 2010; Schaufeli et al., 2006), while in India (Alok, 2013) and Japan (Shimazu et al., 2008) a mono-factor model emerged. Accordingly, he recommends that culture should be studied as a boundary condition while theorizing on work engagement, for culture impacts self-concept, and work engagement is a self-based construct.

Proposing to improve upon the above mentioned drawbacks, this study is undertaken to develop an easily comprehensible, theoretically sound and psychometrically robust measure of work engagement, anchored on the conceptualization of the construct by Schaufeli et al (2002). In subsequent sections, we present three studies that detail the method to arrive at this easy-to-use instrument comprising of short and specific items thus mitigating the problem of ambiguous wording besides requiring less time for completion as well as occupying little space on a

questionnaire (Malach-Pines, 2005). We also investigate the factor structure of the underlying construct of work engagement. In order to control for agreement response bias (Eisenberger et al, 1986), we designed the scale to comprise of positively as well as negatively worded items.

Study 1

The item development study focused on generating the items for the proposed scale based on extant literature. The items were then refined and subjected to content adequacy analysis to support and form a basis for the content validity of the proposed scale.

Item generation

In keeping with the overall aim of this study to develop a short measure with simple and easy-to-understand items to measure work engagement, the initial pool of items was designed to consist of single-worded adjectives or short clauses. The items described the state of the individual in their work settings (Pati, 2012; Saks, 2006; May et al, 2004; Rich et al, 2010; Schaufeli et al, 2002) and reflected the sub-constructs of work engagement - *vigor*, *dedication* and *absorption* (Schaufeli et al., 2002). Engagement is thus understood as a positive, fulfilling, work related state of mind that is characterized by *vigor*, *dedication*, and *absorption* (Schaufeli et al., 2002). *Vigor* is characterized by being highly energetic, resilient and investing effort in one's work while *dedication* is explained as being enthusiastic, feeling inspired and challenged. Finally, *absorption* is defined in terms of a "flow" where one is fully focused and immersed in one's work and has difficulty detaching oneself from work (Schaufeli et al., 2002). As a result of extensive review and study of empirical and theoretical literature in this domain, and based on the prior conceptualization and theoretical development of the construct of engagement in scholarly work, we identified 50 positively and negatively worded items (*vigor* – 16 items; *dedication* – 17 items; *absorption* – 17 items).

Sample and procedure

Guided by DeVellis (2012), these 50 items were tested for content adequacy. 14 doctoral scholars closely acquainted with the discipline of organizational behavior, and three senior faculty members in know of the literature on work engagement, were requested to participate in this study. The average age of doctoral scholar sample was 28.57 years (std. dev. = 3.31) with their average work experience being 4.05 years (std. dev. = 2.34). 29% of the sample comprised of female students.

The students were provided with Schaufeli et al's (2002) definitions of the sub-constructs of *vigor*, *dedication* and *absorption* together with the corresponding item pool for each dimension. They were requested to indicate the degree of relevance of each item in explaining the corresponding sub-construct (1 – Not at all relevant, 5 – Highly relevant).

Simultaneously, a description of the overall construct of work engagement (based on Schaufeli et al's (2002) definition) along with the 50-item pool was provided to the faculty members. They were requested to independently rate each of the items on its degree of relevance in representing the overall construct of work engagement. Their responses were collected on a 5-point Likert scale (1 – Not at all relevant, 5 – Highly relevant).

Analysis and findings

The content adequacy analysis was carried out in three steps. In Step 1, we averaged the ratings for each item provided by the doctoral students. For each sub-construct, positive items with mean scores > 3 were selected and ranked according to their scores (Rank 1 represents highest mean score among the item pool). This exercise eliminated a few unclear and unpersuasive items (e.g. “Galvanized” and “Zealous”).

In Step 2, the ratings provided by the faculty members were similarly averaged followed by ranking of items, with Rank 1 representing the highest mean score. Again, positive items with mean scores > 3 were selected and taken forward for Step 3.

For selecting most representative negative items for the sub-constructs, we adopted two criteria, i.e. (1) at least two faculty members must rate the item > 3 , and (2) the mean score of the item must be > 2.5 ⁶. This exercise was undertaken to ensure the selection of at least 3 negative items for each dimension.

Finally as part of Step 3, we engaged in exhaustive and detailed discussions (in person and over telephone) to select the most representative items among those identified at the end of Step 2. One of the authors argued that the items “Excited” and “Exhilarating” were quite close in meaning and could artificially enhance internal consistency of the scale. Hence we dropped “exhilarating” from the list. Another suggestion that emerged in our discussion was on a few items composed as short phrases. It was recommended that we exclude items comprising of short

⁶ We found that the mean scores for many negative items were < 3 . The reason for this might be the possible difficulty experienced by the participants in relating the negative items to the positive construct of work engagement.

phrases to ensure similarity in representation. After extensive deliberations, items such as “Work tirelessly” and “Consciously occupied” were dropped and instead single worded items with similar meaning such as “Driven” and “Immersed” were chosen. In the end, the above process helped us identify seven single-worded items (4 positives and 3 negatives) for each sub-construct that illustrates them most unambiguously. Together, they constituted the provisional scale of 21-items – QEI-21 (Quick Engagement Inventory-21) depicted in Table 1. These were taken to the next stage of analysis in Study 2.

---Insert Table 1 about here---
Study 2

The objective of the second study was to investigate the factorial validity and internal consistency of the new QEI-21 scale. In the first step, poorly performing items of QEI-21 were eliminated. This further testing and scale purification helps to reduce the number of items in an initial pool to a more manageable number. Items that do not meet certain psychometric criteria were deleted.

Subsequently the dimensionality and reliability of the resultant scale was investigated.

Participants

The participants in Study 2 were executives working in sectors such as Information Technology, Finance, Aeronautics, Power, Govt. organizations and Manufacturing. They were enrolled as participants in short or long duration management development programmes of a reputed business school in North India. All the participants were undergraduates or above with average age of 37.67 years (std. dev. = 7.27). The average work experience of the sample was calculated to be 13.74 years (std. dev. = 6.79). Two respondents had work experience below 2 years. 9 % of the respondents were females.

The data were gathered over a course of a month using a paper and pen survey that was circulated in person among the participants. The respondents were made aware of the objectives of the study and were assured of the confidentiality of their responses. Of the 247 questionnaires collated, 243 usable responses were identified.

Instrument

The administered survey comprised of items belonging to the QEI-21 instrument as well as a range of demographic related items. QEI-21 consisted of 7 items (4 positive items and 3 negative items) for each sub-construct of *vigor*, *dedication* and *absorption*. The participants were

requested to indicate on a Likert continuum (1 - Never to 5 - Always) as to how frequently they feel the way as described by the items. Since work engagement is conceptualized by Schaufeli et al (2002) as a “state of mind”, the individual is the appropriate judge to assess her/his state of mind. Consequently we designed the scale as a self-report.

Analysis and findings

Preliminary item screening: We adhered to the following guidelines for purification of the measure: (1) inter-item correlation coefficients between 0.30 and 0.70 (Mathiowetz, 2003; Kline, 1979) and (2) item-total and item-subscale correlation coefficients of 0.50 and above (Tian et al, 2001) with the assumption that the items have face validity for the corresponding dimension.

Initially we scanned the responses for missing data. All items except VIG1 were found to have less than 10% missing values (VIG1 had 24.7% missing values). Consequently, VIG1 was dropped from analysis. Hair et al (2017) recommend that Expectation Maximization (EM) imputation method be used if the missing values > 10 %. Since it is not the case we opted to replace the missing values with arithmetic mean.

Following this we calculated the correlation coefficients to determine inter-item, item-subscale and item-total correlation (Table 2). Thereafter, with due consultations among all the authors, the three best performing items⁷ for each sub-construct were retained.

---Insert Table 2 about here---

Upon scrutiny of the *vigor* subscale using the above stated guidelines followed by discussion, we eliminated VIG6(R) [*item-total correlation < 0.5*], VIG5(R) and VIG7(R)[*large number of low inter-item correlations*]. Similarly, DED3, DED5(R), DED6(R) and DED7(R) of *dedication* subscale were excluded owing to low correlations with the positive and negative items of *absorption*. Finally, a closer look at Table 2 reveals that for the *absorption* dimension, ABS5(R), ABS6(R) and ABS7(R) displayed the highest item-subscale and item-total correlations and also performed satisfactorily on the inter-item correlation criteria.⁸ In summary,

⁷ Costello & Osborne (2005) assert that latent variables with lesser than three items are unstable

⁸ Though ABS5(R) exhibited correlation values in the range of 0.225-0.26 with VIG4, DED1 and DED2, we retained it thanks to superior face validity. Further, the inter-item correlation between ABS5(R), ABS6(R) and ABS7(R) were on the higher side ranging from 0.711-0.839 indicating overlap. However we retained this combination for (1) it's the only dimension to have all reverse coded items, (2) the items exhibited superior face validity

we were left with a 9-item scale (QEI-9), containing 3 items for each dimension of work engagement at the end of this process. The scale is available in Annexure I.

Confirmatory Factor Analysis: Thereafter, QEI-9 was subjected to a confirmatory factor analysis (CFA) with maximum likelihood estimation through AMOS 20.0. CFA holds greater promise for scholars for it permits the measurement error associated with items to be explicitly modeled resulting in refined latent variables (Brahma & Chakraborty, 2009)

Two models were compared: (i) a mono-factor model where all nine items were made to load on a single underlying factor and (ii) a three-factor higher order model with the three dimensions of *vigor*, *dedication* and *absorption* as latent factors. The model fit is considered good when X^2/df (CMIN/df) < 3.0, the NFI, TLI, GFI and CFI values are > 0.9 and the values for SRMR and RMSEA are < 0.05 and 0.08 respectively (Hoe, 2008). After adjusting for error covariances between VIG2 and VIG3 and between DED2 and DED4, the 3-factor model displayed encouraging overall fit to data. The values obtained for our model were: $X^2/df = 2.732$; CFI = 0.976; TLI = 0.961; NFI = 0.963; GFI = 0.947; SRMR = 0.0376; RMSEA = .085 (Table 3).

---Insert Table 3 about here---

Further, each of the three dimensions also loaded strongly on the higher-order work engagement factor. All items for the three-factor second-order structure model loaded strongly on the corresponding dimension with the standardized factor loadings ranging from 0.71 to 0.97.

Internal consistency: Internal consistency was estimated through Cronbach α for the subscales and the total scale. The α value of *vigor* was calculated to be 0.879 for *vigor*, 0.833 for *dedication* and 0.913 for *absorption*. Also the α value for overall construct of work engagement was determined to be 0.896.

Study 3

The focus of Study 3 was to reconfirm the factor structure of QEI-9 on a distinct sample and re-investigate the internal consistency of the scale. Additionally, we also investigated evidence for its preliminary convergent, discriminant, and nomological validities.

Participants

An online questionnaire explaining the objective of the study and assuring the confidentiality of responses was presented to the participants. The questionnaire comprised of

QEI-9 and other relevant measurement instruments for inferring the validities. A total of 225 respondents (average age = 34.59 years, std. dev. = 5.08; average work experience = 11.72 years, std. dev. = 4.51; all graduates and above; 13% female respondents), took part in the survey during the course of one month. The participants were working executives from various sectors such as IT, Finance, Pharmaceuticals, Aeronautics, and Govt. sector. Approximately 73% of the respondents possessed an undergraduate degree while the rest had Master's degree or above. They were enrolled in executive education program of a premier business school in South India.

Instruments

The distributed survey comprised of items belonging to QEI-9 as well as multiple instruments assessing several variables for validity estimation of the new instrument.

For estimating convergent validity, it included existing measures of work engagement by Pati (2012), Rich et al (2010), Saks (2006), Schaufeli et al (2002) and May et al (2004). Other measures in the survey were those of Perceived Supervisor Support (items derived from Eisenberger et al, 1986) and Perceived Organizational Support (Eisenberger et al, 1986), Job Characteristics (as provided in Saks, 2006), Affective Organizational Commitment (Rhoades et al., 2001), Job Satisfaction (as provided in Saks, 2006), Turnover Intention (Colarelli, 1984), Occupational Self-Efficacy (Rigotti et al, 2008), Work Alienation Scale (Nair & Vohra, 2009), Oldenburg Burnout Inventory (Demerouti et al, 2001), Job Involvement Scale (items taken from Ramsey, Lassk & Marshall, 1995), Short Burnout Questionnaire (Malach-Pines, 2005) and Social Desirability Scale (available in Hollingworth & Valentine, 2015) .

Relevant details about the scales are available in Table 4 and the items for all scales employed in this study are listed in Annexure II.

---Insert Table 4 about here---

Analysis and findings

Factorial validity: We researched the dimensionality of QEI-9 through CFA. Similar to Study 2, two models of work engagement were compared: (i) a mono-factor model where all nine items were made to load on a single underlying factor and (ii) a three-factor higher order model with the three dimensions of *vigor*, *dedication* and *absorption* as latent factors. The results of various fit indices, depicted in Table 6, supported the acceptance of the three-factor higher order conceptualization of QEI-9 (model fit indices: $X^2/df = 2.025$; CFI = 0.986; TLI = 0.980;

NFI = 0.974; GFI = 0.954; SRMR = 0.0317; RMSEA = 0.068) over the mono-factor. Further the standardized factor loadings for each of the nine items ranged from 0.82 - 0.92.

---Insert Table 6 about here---

Social desirability: The social desirability measure did not correlate with QEI-9 or any of its subscales (Table 5). Hence it is inferred that QEI-9 is unaffected by social desirability bias.

Convergent validity: As a test of convergent validity, QEI-9 must exhibit a moderate to high positive correlation with the existing instruments of work engagement. Table 5 details the correlation coefficients of QEI-9 with the five prevailing measures of work engagement namely - UWES (Schaufeli et al., 2002; $r = 0.778$, $p < 0.01$), MAY (May et al., 2004; $r = 0.494$, $p < 0.01$), RICH (Rich et al., 2010; $r = 0.713$, $p < 0.01$), PATI (Pati, 2012; $r = 0.446$, $p < 0.01$), and SAKS (Saks, 2006; $r = 0.672$; $p < 0.01$).

It is evident that QEI-9 correlated moderately to highly with all these measures. Specifically, the scale correlated robustly with UWES ($r = 0.778$, $p < 0.01$), thus reinforcing the same theoretical root of both the measures.

Nomological validity: We established the nomological validity of QEI-9 through investigating its relationship with related constructs from extant research. We selected job satisfaction, perceived organizational support, perceived supervisor support, and turnover intention as related to work engagement based on the recurrence of these constructs in engagement literature (Saks, 2006). Of the above, literature suggests that only turnover intention relates negatively with work engagement (Halbesleben & Wheeler, 2008; Saks, 2006). Further, contingent on burnout theory that conceptualizes engagement as antithesis of burnout (Schaufeli, et. al. 2002), burnout was found to be negatively related with engagement (Schaufeli & Bakker, 2004). Similarly, Hirschfeld & Feild (2000) as well as Pati & Kumar (2015) have provided evidence indicating a negative relationship between work alienation and work engagement. On similar lines self efficacy is argued to be an important factor in engagement research, enjoying a positive relation with the construct (Malach-Pines, 2005; Pati & Kumar, 2010). Finally, Viljevac et al. (2012) had demonstrated that job involvement and organizational commitment are positively related to engagement.

Upon investigating the correlations of QEI-9 with the above mentioned variables, each of the correlation coefficient was in expected direction (Table 5). QEI-9 related negatively with

burnout [for BO (Malach-Pines, 2005): $r = -0.661$, $p < 0.01$]; for OLBI (Demerouti et al., 2001): $r = -0.694$, $p < 0.01$], work alienation ($r = -0.752$, $p < 0.01$), and turnover intention⁹ ($r = -0.428$, $p < 0.01$). Further the measure related positively with job satisfaction ($r = 0.753$, $p < 0.01$), self-efficacy ($r = 0.270$, $p < 0.01$), perceived supervisor support ($r = 0.437$, $p < 0.01$), perceived organization support ($r = 0.535$, $p < 0.01$), job characteristics ($r = 0.660$, $p < 0.01$), organization commitment ($r = 0.638$, $p < 0.01$) and job involvement ($r = 0.569$, $p < 0.01$).

---Insert Table 5 about here---

Discriminant validity: We adhered to the recommendation of Fornell & Larcker (1981) to investigate discriminant validity for QEI-9. Accordingly, the average variance explained (AVE) for each subscale was compared with the squared correlation (SQ-COREL) between that subscale and another subscale. Discriminant validity for the subscale is established if $AVE > SQ-COREAL$. Table 7 details the evidence of discriminant validity for ABS and DED as well as ABS and VIG. However no such evidence was found for VIG and DED.

---Insert Table 7 about here---

Internal consistency: The Cronbach α values for ABS, VIG and DED were calculated to be 0.895, 0.925 and 0.891 respectively. For the complete QEI-9, the Cronbach α was estimated to be 0.932 (Table 5). Thus the instrument exhibited acceptable internal consistency.

Discussion, limitations and future research direction

Our study sought to develop a short and easy-to-use measure for the assessment of work engagement anchored on Schaufeli et al's (2002) definition. The items constituting the scale are broadly based on earlier conceptualizations and extant literature on work engagement. However they are suitable modified to accurately and unambiguously reflect the theoretical foundations of the multi-dimensional nature of the construct comprising of the sub-dimensions of *vigor*, *dedication* and *absorption*. We utilized several established analytical tools in our attempt to develop QEI-9. Beginning with content analysis for establishing face validity of the items, we investigated correlations among variables as well as performed confirmatory factor analysis to validate the theoretically defined factor structure.

⁹ The Cronbach α for TOI scale was calculated to be 0.494. So the result must be interpreted with caution. We believe insufficient number of items is responsible for such low scores.

Our research has several strengths. First, the QEI-9 instrument is short, has easily understandable items and can be quickly administered. Further our analyses provided evidence of a clear factor structure, with acceptable reliability and established validity. Second, the presence of negatively worded items in the measure helps limit the possible negative effects of acquiescence bias among respondents. Third, by using single-worded items in our instrument, concerns related to difficult idiomatic expressions and ambiguous wordings, that plagued the UWES, have been addressed. This renders the instrument more suitable for studies in the oriental culture where lingual concerns regarding improper comprehension of an instrument's items may exist. Fourth, unlike several prior studies undertaken in this area, we were able to empirically establish social desirability independence of our measure. Last, the construction of the scale was accomplished by rigorously adhering to established psychometric processes.

Nevertheless, our study is not without its limitations. First, high inter-item correlations among the negative *absorption* items indicate item redundancy and hence possible narrow representation of the construct. Second, similar to prior studies in this area (e.g. Rothbard, 2001; Sonnentag, 2003; May et al., 2004; Schaufeli & Bakker, 2004), we assessed all our study variables through self-reports. Accordingly there could be possibility that the study results were affected by common method bias. Finally, the higher than expected correlation between the subscales of *absorption*, *dedication* and *vigor* warrant further research to establish the distinctiveness of the constructs, especially between *vigor* and *dedication*. This supports the view of Viljevac et al (2012) who have suggested work engagement as a construct with two latent factors, with the elimination of *dedication* dimension. We recommend that future studies on work engagement further investigate the dimensionality of the overall work engagement construct. Our study also did not explore the influence of culture on the concept of work engagement. We suggest that researchers probe this line of research to establish the construct of work engagement more strongly in academic literature.

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TABLE 1: QUICK ENGAGEMENT INVENTORY– INITIAL ITEM POOL (QEI-21)

Item No.	Item Name	Dimension
VIG1	Passionate	Vigor
VIG2	Energetic	
VIG3	Excited	
VIG4	Spirited	
VIG5 (R)	Lazy	
VIG6 (R)	Inertia	
VIG7 (R)	Lethargic	
DED1	Enthusiastic	Dedication
DED2	Driven	
DED3	Determined	
DED4	Motivated	
DED5 (R)	Purposeless	
DED6 (R)	Disheartened	
DED7 (R)	Meaningless	
ABS1	Engrossed	Absorption
ABS2	Immersed	
ABS3	Focused	
ABS4	Attentive	
ABS5 (R)	Distracted	
ABS6 (R)	Bored	
ABS7 (R)	Inattentive	

TABLE 2: INTER-ITEM, ITEM-SUBSCALE AND ITEM TO TOTAL CORRELATIONS (STUDY 2)

	VIG2	VIG3	VIG4	VIG5(R)	VIG6(R)	VIG7(R)	DED1	DED2	DED3	DED4	DED5(R)	DED6(R)	DED7(R)	ABS1	ABS2	ABS3	ABS4	ABS5(R)	ABS6(R)	ABS7(R)	VIG	DED	ABS	QEI-20	
VIG2	1																								
VIG3	.778	1																							
VIG4	.642	.708	1																						
VIG5(R)	.271	.229	.285	1																					
VIG6(R)	.248	.159	.168	.435	1																				
VIG7(R)	.289	.221	.311	.673	.524	1																			
DED1	.658	.715	.784	.285	.187	.319	1																		
DED2	.557	.576	.636	.210	.129	.224	.635	1																	
DED3	.595	.531	.541	.261	.188	.281	.536	.551	1																
DED4	.575	.610	.588	.238	.238	.259	.633	.616	.565	1															
DED5(R)	.396	.370	.419	.618	.365	.646	.352	.293	.280	.305	1														
DED6(R)	.370	.289	.306	.488	.327	.489	.249	.241	.269	.333	.730	1													
DED7(R)	.369	.343	.401	.554	.320	.570	.314	.253	.324	.297	.837	.801	1												
ABS1	.516	.516	.530	.093	.208	.143	.526	.561	.545	.627	.192	.197	.189	1											
ABS2	.519	.514	.572	.236	.173	.260	.595	.477	.522	.535	.246	.137	.255	.704	1										
ABS3	.578	.555	.573	.302	.107	.301	.531	.478	.641	.470	.332	.215	.338	.561	.665	1									
ABS4	.549	.447	.506	.321	.109	.377	.523	.410	.498	.449	.346	.245	.332	.445	.567	.744	1								
ABS5(R)	.365	.315	.260	.525	.318	.498	.239	.225	.365	.320	.676	.813	.777	.214	.201	.281	.285	1							
ABS6(R)	.412	.405	.388	.578	.357	.572	.392	.309	.367	.405	.737	.769	.821	.260	.272	.350	.320	.839	1						
ABS7(R)	.356	.299	.390	.593	.284	.659	.408	.295	.374	.334	.717	.633	.748	.195	.304	.360	.443	.711	.786	1					
VIG	.723	.688	.701	.718	.633	.754	.666	.523	.545	.569	.680	.547	.616	.447	.517	.549	.531	.551	.651	.626	1				
DED	.670	.650	.697	.545	.357	.570	.696	.665	.651	.709	.790	.757	.797	.525	.515	.565	.534	.706	.778	.715	.815	1			
ABS	.628	.581	.610	.546	.321	.575	.609	.519	.630	.599	.673	.639	.722	.621	.685	.733	.704	.748	.802	.786	.765	.866	1		
QEI-20	.715	.679	.712	.635	.453	.667	.700	.611	.653	.671	.764	.698	.766	.572	.613	.660	.632	.720	.799	.761	.908	.959	.942	1	

Note: ** $p < 0.01$; * $p < 0.05$; VIG (2-7): *vigor* items; DED (1-7): *dedication* items; ABS (1-7): *absorption* items; VIG: Total score of the *vigor* subscale; DED: Total score of *dedication* subscale; ABS: Total score of *absorption* subscale; QEI-20: Total score of Work Engagement construct (as measured by QEI-20); (R) against any item indicates that the said item is reverse coded in the measure.

TABLE 3: MODEL FIT INDICES COMPARISON (STUDY 2)

Model Fit Indices	Acceptable values (Hoe 2008)	Single factor model	Three factor model with a second order construct
X ² /df	< 3.00	20.83	2.732
CFI	0.9 - 1	0.654	0.976
NFI	0.9 - 1	0.644	0.963
TLI	0.9 - 1	0.555	0.961
GFI	0.9 - 1	0.654	0.947
RMSEA	< 0.08	0.286	0.085
SRMR	<0.05	0.1699	0.0376

Note: The guidelines for “Acceptable values” were borrowed from Hoe (2008). X²/df: Ratio of chi-square statistic to the degrees of freedom; CFI: Confirmatory Fit Index; NFI: Normed Fit Index; GFI: Goodness of Fit Index; CFI: Confirmatory Fit Index; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Mean Square Residual

TABLE 4: DETAILS OF VARIOUS INSTRUMENTS (STUDY 3)

S. No.	Constructs	Source	No. of items	Scale (Likert Scale)	Representative Item
1	Oldenburg Burnout Inventory (OLBI)	Demerouti et al, (2001)	16	4-point (1 = Strongly agree 4 = Strongly disagree)	After my work, I usually feel worn out and weary.
2	Perceived Supervisor Support (PSS) ¹⁰	Eisenberger et al. (1986)	4	5-point (1 = Strongly disagree 5 = Strongly agree)	The supervisor cares about my opinions.
3	Perceived Organization Support (POS) ¹¹	Eisenberger et al. (1986)	4		The organization values my contribution to its well-being.
4	Job Satisfaction (JS)	Saks (2006)	3		All in all, I am satisfied with my job.
5	Turnover Intention (TOI)	Colarelli, (1984)	3		I am planning to search for a new job during the next 12 months.
6	Work Engagement Scale (PATI)	Pati (2012)	7		I give my all to my job.
7	Work Engagement Scale (MAY)	May et al (2004)	13		Performing my job is so absorbing that I forget about anything else.
8	Work Engagement Scale (RICH)	Rich et al (2010)	18		I work with intensity on my job.
9	Work Engagement Scale (SAKS)	Saks (2006)	11		I really "throw" myself into my job.
10	Occupational Self-Efficacy (SE) ¹²	Rigotti et al (2008)	4		6-point (1 = Not At All true 6 = Completely true)
11	Affective Organizational Commitment (OC) ¹³	Rhoades, et al. (2001)	4	7-point (1 = Strongly disagree 7 = Strongly agree)	I feel a strong sense of belonging to my organization.
12	Job Involvement (JBINV) ¹⁴	Ramsey, Lask & Marshal (1995)	6		The most important things that happen to me involve my work.
13	Social Desirability (SDS)	Hollingworth & Valentine (2015)	4		I like to gossip at times.
14	Work Alienation (WA)	Nair & Vohra (2009)	8	7-point (1 = Totally disagree 7 = Totally agree)	I do not enjoy my work.

¹⁰ We selected four items with high factor loadings from SPOS-36 (Eisenberger et al, 1986) based on the process followed in Eisenberger et al (2002), where the authors selected high loading items from SPOS-36 and replaced the word "organization" with "supervisor" to construct a short form of PSS scale. These items are 10, 9, 25 and 27.

¹¹ We selected four items with high factor loadings from SPOS-36 (Eisenberger et al, 1986) based on the process followed in Eisenberger et al (2002), where the authors selected high loading items from SPOS-36 to construct a short form of POS scale. These items are Item 1, 9, 21 and 27.

¹² We selected the top four items in terms of factor loadings for this study

¹³ We selected the top four items in terms of factor loadings for this study

¹⁴ We used the short 6-item scale for this study.

15	Short Burnout Questionnaire (BO)	Malach-Pines (2005)	10	7 point (1 = Never 7= Always)	Disappointed with people.
16	Utrecht Work Engagement (UWES-9)	Schaufeli, Bakker & Salanova (2006)	9	7 point (0 = Never 6 = Always)	At my work, I feel bursting with energy.
17	Job characteristics (JBCHR)	Saks (2006)	6	7-point (various scale anchors)	How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work.

TABLE 5: INTER-CORRELATIONS BETWEEN VARIABLES (STUDY 3)

	PATI	MAY	RICH	SAKS	POS	JS	TOI	PSS	WA	JBCHR	SDS	OC	JINV	BO	SE	UWES	OLBI	VIG	DED	ABS	QEI-9	
PATI	(0.746)																					
MAY	.606-	(0.642)																				
RICH	.730-	.721-	(0.965)																			
SAKS	.610-	.659-	.802-	(0.843)																		
POS	.374-	.366-	.485-	.640-	(0.916)																	
JS	.385-	.444-	.683-	.662-	.648-	(0.769)																
TOI	-.150-	-.207-	-.277-	-.411-	-.473-	-.537-	(0.494)															
PSS	.365-	.304-	.394-	.480-	.636-	.477-	-.383-	(0.940)														
WA	-.231-	-.320-	-.567-	-.522-	-.492-	-.738-	.557-	-.408-	(0.935)													
JBCHR	.418-	.346-	.584-	.553-	.548-	.583-	-.311-	.542-	-.576-	(0.818)												
SDS	-0.054	-0.028	-0.04	0.038	-0.032	-0.052	0.094	-0.03	.151-	0.01	(0.632)											
OC	.432-	.472-	.582-	.729-	.720-	.669-	-.492-	.529-	-.511-	.541-	0.062	(0.948)										
JINV	.471-	.614-	.640-	.652-	.494-	.490-	-.331-	.380-	-.446-	.441-	-0.02	.641-	(0.825)									
BO	-.217-	-.223-	-.379-	-.371-	-.486-	-.628-	.494-	-.367-	.694-	-.452-	.163	-.473-	-.356-	(0.941)								
SE	.499-	.281-	.453-	.387-	.185-	.308-	-0.077	.185-	-.163-	.270-	0.004	.263-	.269-	-.171-	(0.814)							
UWES	.596-	.598-	.802-	.734-	.559-	.714-	-.423-	.518-	-.682-	.643-	-0.059	.683-	.698-	-.562-	.401-	(0.949)						
OLBI	-.321-	-.403-	-.532-	-.519-	-.560-	-.681-	.502-	-.466-	.735-	-.550-	0.107	-.556-	-.537-	.715-	-.352-	-.712-	(0.879)					
VIG	.479-	.483-	.706-	.662-	.505-	.698-	-.351-	.421-	-.646-	.647-	-.118	.628-	.577-	-.562-	.298-	.763-	-.631-	(0.925)				
DED	.447-	.463-	.702-	.666-	.585-	.733-	-.424-	.512-	-.682-	.656-	-.055	.679-	.586-	-.577-	.333-	.794-	-.656-	.906-	(0.891)			
ABS	.257-	.362-	.479-	.452-	.328-	.560-	-.356-	.229-	-.655-	.445-	-.018	.385-	.345-	-.604-	.090	.506-	-.548-	.541-	.543-	(0.895)		
QEI-9	.446-	.494-	.713-	.672-	.535-	.753-	-.428-	.437-	-.752-	.660-	-0.072	.638-	.569-	-.661-	.270-	.778-	-.694-	.923-	.923-	.796-	(0.932)	

Note: ** $p < 0.01$; * $p < 0.05$; UWES: Work Engagement scale (Schaufeli et al, 2002); JS: Job Satisfaction scale (Saks, 2006); POS: Perceived Organization Support scale (Eisenberger et al, 1986); TOI: Turnover Intention scale (Colarelli 1984); PSS: Perceived Supervisor Support Scale (Eisenberger et al, 1986); JBCHR; Job Characteristics Scale (Saks, 2006); OC: Affective Organizational Commitment Scale (Rhoades et al, 2001); JINV: Job Involvement Scale (Ramsey, Lassk & Marshal l, 1995); BO: Short Burnout Questionnaire (Malach-Pines, 2005) ; OLBI: Oldenburg Burnout Inventory (Demerouti et al, 2001) ; WA: Work Alienation scale (Nair & Vohra, 2009); SDS: Social Desirability Scale (Hollingworth & Valentine (2015); SE: Occupational Self Efficacy Scale (Rigotti et al, 2008); PATI: Work Engagement Scale (Pati, 2012); MAY: Work Engagement Scale (May et al, 2004); RICH: Work Engagement Scale (Rich et al, 2010); SAKS: Work Engagement Scale (Saks, 2006); VIG: *Vigor* subscale; DED: *Dedication* subscale; ABS: *Absorption* subscale; QEI-9: Quick Engagement Inventory (nine items). Numbers in diagonals are Cronbach α .

TABLE 6: MODEL FIT INDICES COMPARISON (STUDY 3)

Model Fit Indices	Acceptable values (Hoe 2008)	Single factor model	Three factor model with a second order construct
X ² /df	< 3.00	12.39	2.025
CFI	0.9 – 1	0.824	0.986
NFI	0.9 – 1	0.812	0.974
TLI	0.9 – 1	0.774	0.980
GFI	0.9 - 1	0.727	0.954
RMSEA	< 0.08	0.226	0.068
SRMR	<0.05	0.1226	0.0317

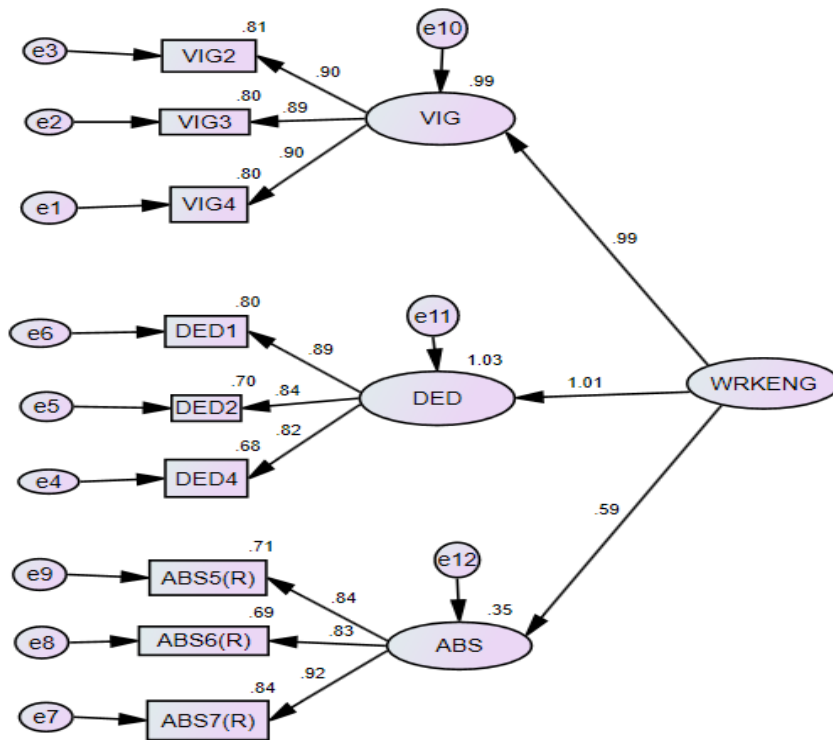
Note: The guidelines for “Acceptable values” were borrowed from Hoe (2008). X²/df: Ratio of chi-square statistic to the degrees of freedom; CFI: Confirmatory Fit Index; NFI: Normed Fit Index; GFI: Goodness of Fit Index; CFI: Confirmatory Fit Index; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Mean Square Residual

TABLE 7: ANALYSIS FOR DISCRIMINANT VALIDITY (STUDY 3)

	VIG	DED	ABS
VIG	(0.804)		
DED	0.821	(0.723)	
ABS	0.293	0.295	(0.747)

Note: The values within brackets are the Average Variance Extracted (AVE) for each subscale i.e. *Vigor* (VIG), *Dedication* (DED) and *Absorption* (ABS). The other values are squared correlations among the factors.

FIGURE 1: FACTOR STRUCTURE OF QEI-9 (STUDY 3)



Note: VIG is *vigor* dimension, DED is *dedication* dimension and ABS is *absorption* dimension.

ANNEXURE I

QUICK ENGAGEMENT INVENTORY (QEI – 9)

Please read each statement carefully and decide how frequently you feel this way. Please refer to the table below for indicating your response.

Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
<i>Almost Never</i>	<i>Once a month or less</i>	<i>Few times a month</i>	<i>Once or more in a week</i>	<i>Everyday</i>

Item No	Item Name	Scale				
		1	2	3	4	5
VIG2	Energetic	1	2	3	4	5
DED1	Enthusiastic	1	2	3	4	5
ABS7 (R)	Inattentive (R)	1	2	3	4	5
VIG3	Excited	1	2	3	4	5
DED2	Driven	1	2	3	4	5
ABS5 (R)	Distracted (R)	1	2	3	4	5
DED4	Motivated	1	2	3	4	5
VIG4	Spirited	1	2	3	4	5
ABS6 (R)	Bored (R)	1	2	3	4	5

Note: (R) indicates reverse-coded items; *Vigor* items are VIG2, VIG3 and VIG4; *Dedication* items are DED1, DED2, and DED4; *Absorption* items are ABS5 (R), ABS6 (R) & ABS7 (R).

ANNEXURE II

Work Engagement Scale – PATI

Passionate Task Performance

I give my all to my job.

I push myself really hard to meet any challenge in job performance.

I exert a lot of energy in performing my job.

Organizational Citizenship Behaviour

I frequently suggest coworkers on how the group can improve.

I voluntarily help new employees settle into their jobs.

For issues that may have serious consequences I express my opinions honestly even when others may disagree.

I show genuine concern and courtesy towards co-workers, even in most trying business or personal situations.

Work Engagement Scale – MAY

Performing my job is so absorbing that I forget about anything else.

I often think about other things when performing my job. (R)

I am rarely distracted when performing my job.

Time passes quickly when I perform my job.

I really put my heart into my job.

I get excited when I perform well on my job.

I often feel emotionally detached from my job. (R)

My own feelings are affected by how well I perform my job.

I exert a lot of energy performing my job.

I stay until the job is done.

I avoid working overtime whenever possible. (R)

I take work home to do.

I avoid working too hard. (R)

Work Engagement Scale – RICH

Physical engagement

I work with intensity on my job.

I exert my full effort to my job.

I devote a lot of energy to my job.

I try my hardest to perform well on my job.

I strive as hard as I can to complete my job.

I exert a lot of energy on my job.

Emotional engagement

I am enthusiastic in my job.

I feel energetic at my job.

I am interested in my job.

I am proud of my job.

I feel positive about my job.

I am excited about my job.

Cognitive engagement

At work, my mind is focused on my job.

At work, I pay a lot of attention to my job.

At work, I focus a great deal of attention on my job.

At work, I am absorbed by my job.

At work, I concentrate on my job.

At work, I devote a lot of attention to my job.

Work Engagement Scale – SAKS

Job engagement

I really “throw” myself into my job.

Sometimes I am so into my job that I lose track of time.

This job is all consuming; I am totally into it.

My mind often wanders and I think of other things when doing my job. (R)

I am highly engaged in this job.

Organization engagement

Being a member of this organization is very captivating.

One of the most exciting things for me is getting involved with things happening in this organization.

I am really not into the “goings-on” in this organization. (R)

Being a member of this organization make me come “alive.”

Being a member of this organization is exhilarating for me.

I am highly engaged in this organization.

Work Engagement Scale – UWES

Vigor

At my work, I feel bursting with energy.

At my job, I feel strong and vigorous.

When I get up in the morning, I feel like going to work.

Dedication

I am enthusiastic about my job.

My job inspires me.

I am proud on the work that I do.

Absorption

I feel happy when I am working intensely.

I am immersed in my work.

I get carried away when I’m working.

Perceived Organizational Support Scale

The organization values my contribution to its well-being.

The organization really cares about my well-being.

The organization cares about my general satisfaction at work.

The organization takes pride in my accomplishments at work.

Job Satisfaction Scale

All in all, I am satisfied with my job.

In general, I do not like my job. (R)

In general, I like working here.

Turnover Intention Scale

I frequently think of quitting my job.

I am planning to search for a new job during the next 12 months.

If I have my own way, I will be working for this organization one year from now. (R)

Perceived Supervisor Support Scale

The supervisor is willing to extend himself/herself in order to help me perform my job to the best of my abilities.

The supervisor really cares about my well-being.

The supervisor cares about my opinions.

The supervisor takes pride in my accomplishments at work.

Work Alienation Scale

I do not enjoy my work.

Facing my daily tasks is a painful and boring experience.

Work to me is more like a chore or burden.

I feel estranged / disconnected from myself.

I often wish I were doing something else.

Over the years I have become disillusioned about my work.

I do not feel like putting in my best effort at work.

I do not feel connected to the events in my workplace.

Job Characteristics Scale

How much variety is there in your job? That is, to what extent does the job require you to do many different things at work, using a variety of your skills and talents?

To what extent do managers or co-workers let you know how well you are doing on your job?

To what extent does doing the job itself provide you with information about your work performance? That is, does the actual work itself provide clues about how well you are doing – aside from any “feedback” co-workers or supervisors may provide?

How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work?

To what extent does your job involve doing a “whole” and identifiable piece of work? That is, is the job a complete piece of work that has an obvious beginning and end? Or is it only a small part of the overall piece of work, which is finished by other people or by automatic machines?

In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?

Social Desirability Scale

I like to gossip at times.

There have been occasions when I took advantage of someone.

I sometimes try to get even, rather than forgive and forget.

At times I have really insisted on having things my own way.

Affective Organizational Commitment Scale

I feel a strong sense of belonging to my organization.

I feel personally attached to my work organization.

I am proud to tell others I work at my organization.

Working at my organization has a great deal of personal meaning to me.

Job Involvement Scale

The major satisfaction in my life comes from my job.

The most important things that happen to me involve my work.

I'm really a perfectionist about my work.

I live, eat and breathe my job.

I am very much involved personally in my work.

Most things in life are more important than work.

Short Burnout Questionnaire

Tired

Helpless

Depressed

Disappointed with people

Hopeless

Trapped

Physically weak/Sickly

Worthless/Like a failure

Difficulties sleeping

“I’ve had it”

Occupational Self Efficacy Scale

I can remain calm when facing difficulties in my job because I can rely on my abilities.

When I am confronted with a problem in my job, I can usually find several solutions.

Whatever comes my way in my job, I can usually handle it.

My past experiences in my job have prepared me well for my occupational future.

Oldenburg Burnout Inventory

Disengagement

I always find new and interesting aspects in my work.

It happens more and more often that I talk about my work in a negative way. (R)

Lately, I tend to think less at work and do my job almost mechanically. (R)

I find my work to be a positive challenge.

Over time, one can become disconnected from this type of work. (R)

Sometimes I feel sickened by my work tasks. (R)

This is the only type of work that I can imagine myself doing.

I feel more and more engaged in my work.

Exhaustion

There are days when I feel tired before I arrive at work. (R)

After work, I tend to need more time than in the past in order to relax and feel better. (R)

I can tolerate the pressure of my work very well.

During my work, I often feel emotionally drained. (R)

After working, I have enough energy for my leisure activities.

After my work, I usually feel worn out and weary. (R)

Usually, I can manage the amount of my work well.

When I work, I usually feel energized.

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