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The psychometric properties of the Utrecht Work Engagement Scale on a Zimbabwean population

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Orientation: Work engagement has been found to be related to positive job attitudes such as job involvement, job satisfaction, organisational commitment, and low turnover intention.

Research purpose: The primary goal of this study was to test the psychometric properties of the Utrecht Work Engagement Scale (UWES) on a Zimbabwean sample.

Motivation for the study: The UWES is a widely used measure of work engagement. Therefore, there is a need to assess the reliability and construct validity of the UWES in a Zimbabwean sample owing to the paucity of studies on its psychometric properties in this setting.

Research approach/design and method: A cross-sectional survey research design was employed (N = 304). A non-probability sample of 304 participants from selected security organisations was studied. The UWES was used to measure work engagement, and its reliability was evaluated using SPSS. Construct validity was assessed through confirmatory factor analysis (CFA) using LISREL.

Main findings: Moderately high levels of reliability were found for the UWES subscales. A poor model fit with the data was found for first-order measurement models through CFA.

Practical/managerial implications: The UWES demonstrated a reasonable fit for the 9-item scale CFA model tested in this study. Moderately high reliability coefficients were recorded for all the subscales of the UWES.

Contribution/value-add: The study promotes the use of reliable and valid instruments in Zimbabwe by confirming the psychometric properties of the UWES.

Keywords: confirmatory factor analysis; Cronbach's alpha; construct validity; discriminant validity; work engagement.

Introduction

Recently, researchers have shown increased interest in work engagement owing to its positive influence on a wide range of organisational outcomes (Loscalzo & Giannini, 2018; Meng & Jin, 2017; Pandita & Ray, 2018). Previous studies have demonstrated a strong and consistent association between work engagement and positive work attitudes such as job involvement, job satisfaction, organisational commitment, and low turnover intention (Bakker, 2017; Demerouti et al., 2001; Hakanen et al., 2008; Hallberg & Schaufeli, 2006; Schaufeli & Bakker, 2004). Some studies have indicated that work engagement has a positive influence on the overall health of employees by reducing levels of distress, depression, and psychosomatic complaints (Demerouti et al., 2001; Schaufeli & Bakker, 2004). Several studies have documented significant correlations between work engagement and customer satisfaction, financial returns, high performance, and topics such as absenteeism (Chhetri, 2017; Davis & Van der Heijden, 2018; Gupta & Shukla, 2018; Gutermann et al., 2017; Meyer, 2017). Ouweneel et al. (2013) found that when organisations implemented programmes for people with low engagement in their work, it led to significant improvements in self-efficacy at work and increased the experience of positive emotions.

Work engagement is defined as 'a positive, fulfilling, work-related state of mind that is characterised by vigour, dedication, and absorption' (Schaufeli & Bakker, 2004; Schaufeli et al., 2002). Work engagement is characterised by the concurrent utilisation and demonstration of an individual's idealised identity in actions related to tasks that foster connections with work and colleagues. It involves exhibiting personal presence in terms of physical, cognitive, and emotional aspects along with active and complete performance (Kahn, 1990; Rich et al., 2010; Saks, 2017). Three psychological conditions are associated with work engagement or disengagement at work: availability, safety, and meaningfulness (Kahn, 1990). *Availability* refers

to individuals' psychological presence and ability to bring their whole selves to work (Soares & Mosquera, 2019). *Safety*, on the other hand, indicates the psychological sense of security and confidence individuals have in their work environment. *Meaningfulness* alludes to the perception that one's work is significant, purposeful, and aligned with personal values and goals (Soares & Mosquera, 2019). It is worth observing that the relationship between these psychological conditions and work engagement is complex and bidirectional. Engaged employees may perceive higher levels of availability, safety, and meaningfulness, and fostering these conditions can also contribute to increased work engagement (Yadav & Morya, 2019).

Research suggests that engaged employees tend to perform better than their non-engaged counterparts (Gallup, 2018; Luthans & Avolio, 2009; Opolot & Maket, 2020; Schaufeli, 2013). In a study examining the relationship between meaningful work, work engagement, and job resources, meaningful work was strongly associated with work engagement (Albrecht et al., 2021). Engaged employees were more likely to experience meaningful work, which, in turn, contributed to higher levels of work engagement. This finding implies a two-way relationship between work engagement and performance, whereby engaged workers are more likely to perform better. Improvements in performance can also lead to higher levels of employee engagement (Yadav & Morya, 2019). Overall, work engagement has been depicted as one of the means by which organisations create a competitive advantage. By cultivating a highly engaged workforce and leveraging the positive outcomes associated with work engagement, organisations can enhance their performance, productivity, and overall success.

Thus far, the evidence demonstrates how significant work engagement is in the overall success of organisations and the supposed need for its measurement to implement interventions that foster a conducive environment. The Utrecht Work Engagement Scale (UWES) is a widely used measure of work engagement that has shown evidence of validity in several countries, for example, China (Meng & Jin, 2017; Yi-Wen & Yi-Qun, 2005), Finland (Hakanen, 2002), Japan (Shimazu et al., 2008), the Netherlands (Schaufeli et al., 2002), Norway (Nerstad et al., 2009), and Spain (Schaufeli et al., 2002; Schaufeli & Bakker, 2003). The UWES has also been validated in Africa, for example, Nigeria (Ugwu, 2013), Sierra Leone (Vallières et al., 2017), and South Africa (De Bruin et al., 2013; Storm & Rothmann, 2003). In most studies, the 17-item UWES assumed a three-factor structure (Schaufeli et al., 2006; Storm & Rothman, 2003); however, not all factors were invariant across all countries. There are inconsistencies regarding the appropriate factor structure, with some studies failing to support the three-factor structure (Sonnentag, 2003; Wefald & Downey, 2009), arguing that a unidimensional structure is the best representation. Conflicting evidence was also found in the shortened versions of the scale (Fong, 2012; Mills et al., 2012; Vecina et al., 2012). While the literature on the validation of the work engagement questionnaire is increasing across the globe, a paucity of research exists in Zimbabwe; hence, there is a need to establish the psychometric properties in the current setting to ensure its accuracy, reliability, and credibility.

Research objectives

The main objective of this study was to determine the reliability of the UWES developed by Schaufeli et al. (2002) by computing Cronbach's alpha reliability coefficients for each subscale. The secondary objective was to perform a preliminary construct validity analysis of the scale to test the underlying theoretical model by using a Zimbabwean sample.

Contribution to the field

Work engagement has been linked to several positive outcomes that are beneficial to individuals and organisations. Highly engaged employees are likely to have a sense of meaning, enjoyment, and fulfilment from their work, leading to a higher propensity to experience job satisfaction and commitment (Albrecht et al., 2021; Meng & Jin, 2017). Work engagement is associated with increased productivity, profitability, and customer satisfaction (Nazir & Islam, 2020). Engaged employees tend to be more motivated, focused, and proactive in their work, leading to higher quality work output and better customer service (Milliman et al., 2018). Moreover, engaged employees tend to outperform their non-engaged counterparts. Evidence suggests that work engagement acts as a protective factor against negative outcomes, such as burnout and absenteeism. Engaged employees are less likely to experience burnout, which can help reduce the costs associated with absenteeism and turnover (Hakanen et al., 2008). The UWES is a widely used measure of work engagement. However, this measure was developed in America and validated in several countries in Europe, Asia, and some parts of Africa. Therefore, it was deemed necessary to ascertain the reliability and validity of the instrument in the Zimbabwean context. This study adds to the body of knowledge on the psychometric properties of the UWES.

Conceptualisation and definition of work engagement

Work engagement is described as a positive motivational and work-related state, characterised by vigour, dedication, and absorption (Schaufeli & Bakker, 2004). The vigour component encompasses various aspects of employee experience in the workplace. It is characterised by elevated levels of vitality and mental strength, strong eagerness to contribute sufficient effort to their work and a sense of determination even when faced with challenges (Hakanen et al., 2006; Schaufeli et al., 2002). *Vigour* represents a positive work-related state in which individuals exhibit high levels of energy, mental resilience, and a willingness to persist in their tasks (Meijerink et al., 2020). *Dedication* encompasses the experience of noteworthiness and meaning in one's work, motivation, pride, excitement, and ability to embrace challenges. It is characterised by a strong work ethic, loyalty, and a deep sense of connection to the organisation's mission and goals (Llorens et al., 2007). *Dedication* drives individuals to go the extra mile, continually improve themselves, and

contribute to the success of their organisation (Hakanen et al., 2006). *Absorption* refers to a state of intense focus, concentration, or motivation. This implies being fully engrossed in the tasks at hand with little distraction or interruption (Bakker et al., 2007). This state of absorption often leads to increased productivity and effectiveness in task completion. From this definition, it can be suggested that there is an overlap between vigour and work motivation in terms of their conceptualisations, while dedication is related to job involvement (Mauno et al., 2007).

Work engagement has also been conceptualised as the opposite of burnout, whereby employees fall between the poles of this continuum (Kahn, 1990; Schaufeli et al., 2002). Burnout is defined as a psychological state characterised by emotional exhaustion, cynicism, and reduced personal accomplishment (Leon et al., 2015). Work engagement is characterised by *high involvement*, the opposite of cynicism or low involvement; *high energy*, the opposite of exhaustion or low energy; and *high efficacy*, opposite to inefficacy or low efficacy.

Schaufeli and Salanova (2011) distinguished between two forms of work engagement: (1) *task engagement*, referring to the task at hand, and (2) *habitual engagement*, referring to the job in general. Schaufeli and Salanova believe that jobs are composed of various tasks that may induce different levels of employee engagement. Employees may be more engaged when attending to certain tasks compared to other tasks. For instance, research has shown a positive relationship between task engagement and an individual's task resources (Llorens et al., 2007). In addition, an assessment of day-level engagement indicated differences in levels of absorption with tasks performed early in the morning and evening with the highest levels and those performed between 14:00 and 16:00, which had the lowest levels of absorption (Rodríguez-Sánchez et al., 2011).

Saks (2006) conceptualised work engagement from the perspective of Social Exchange Theory (SET). This model of work engagement proposes that in an employer–employee relationship, there should be specific rules that evolve into trust and committed interactions over time. These rules include individual actions that evoke responses from other people (Saks, 2006). Thus, an employer's desirable actions may lead to employee work engagement. Although the phenomenon of work engagement can be viewed from different theories, the bottom line is that an engaged employee is one who is connected to their job, is dedicated to their work, and experiences personal fulfilment through their work (Heine, 2013). This study utilised the three-factor conceptualisation of work engagement as defined by Schaufeli et al. (2002).

Utrecht Work Engagement Scale

Originally, the 24-item UWES was used to measure work engagement. This original scale was then adapted by Schaufeli and Bakker (2003), who eliminated unsound items after factor analysis, leaving only 17 items. The remaining items describe vigour, absorption, and dedication. The 17-item UWES developed by Schaufeli et al. (2002) comprises six absorption items, five for dedication, and six items for vigour (Schaufeli & Bakker, 2003). This three-dimensional scale has high internal consistency, with Cronbach's alpha exceeding $\alpha = 0.70$ (Rothmann, 2003). According to Schaufeli et al. (2002), the UWES-17 had $\alpha = 0.80$ for vigour, $\alpha = 0.89$ for dedication, and $\alpha = 0.72$ for absorption. A high correlation was found between the factors ($r = 0.70$), especially between vigour and absorption ($r > 0.90$ for latent variables and $r > 0.70$ for observable variables). A validation study by Ugwu (2013) in a Nigerian sample found an internal consistency reliability of $\alpha = 0.85$ for the global scale. The same study obtained Cronbach's alpha of $\alpha = 0.73$ for the vigour dimension, $\alpha = 0.79$ for dedication and $\alpha = 0.70$ for absorption. Schaufeli et al. (2006) also developed a shorter 9-item version (UWES-9) with only three items per dimension to measure work engagement. Schaufeli et al. (2006) used data collected from 10 different countries ($N = 14\,521$) and their study concluded that UWES-9 has acceptable psychometric properties across all national samples, satisfying the value of Cronbach's alpha between 0.80 and 0.92. The psychometric quality of the UWES-9 has been corroborated by Balducci et al. (2010). In terms of model fit, a confirmatory factor analysis (CFA) conducted by Hallberg and Schaufeli (2006) obtained a root mean square error of approximation (RMSEA) of 0.07, standardised root mean square residual (SRMR) of 0.07 and comparative fit index (CFI) of 0.97. A validation study on a Chinese sample produced an RMSEA of 0.02, CFI of 0.99 and a goodness-of-fit-index of 0.97 for the 17-item UWES (Meng & Jin, 2017).

Research design

This study aimed to determine the psychometric properties of the UWES-17 in a Zimbabwean context. A cross-sectional research design was employed to achieve the objectives of this study. Data were gathered by administering the UWES, a self-administered survey, to employees within several Zimbabwean organisations.

Sample

The population comprised 5000 private security employees from 10 companies. The overall sample of the study consisted of 304 participants drawn from selected security organisations in Zimbabwe. The response rate was 76%. Females constituted 28.9% of the sample, while males constituted 69.9%. The majority (42.4%) fell within the 31–40 age category, and 28.9% fell within the 41–50 age category. All respondents were black Africans. A total of 89.1% of the respondents had an ordinary level certificate (equivalent to grade 11) as their highest level of education. A total of 64.5% of the participants were permanent employees, and 24.7% were on contract.

Measuring instrument

The original 17 items UWES was used to measure the participants' work engagement. The scale was developed by Schaufeli et al. (2002). The scale consists of three dimensions of work engagement: vigour, dedication, and absorption. The

UWES has demonstrated sound reliability and validity, and the three-factor structure of the UWES fits well with the data of various samples. Example items for the vigour subscale include 'At my job, I feel strong and vigorous'. Example items for the absorption subscale include 'When I am working, I forget everything else around me'. Example items for the dedication subscale include 'I find the work that I do full of meaning and purpose'. The internal consistency of the three scales of the UWES is relatively high, with Cronbach's alphas exceeding 0.70 (Schaufeli & Bakker, 2003). Acceptable Cronbach's alpha coefficients of the three scales have also been confirmed in South Africa and Nigeria (Rothmann, 2003; Ugwu, 2013).

Research procedure

The questionnaires were distributed face-to-face through human resource management (HRM) and operations units of the organisations. These two departments (HRM and operations) closely assisted in the study because they had easy access to all employees in the organisations. Convenience sampling was used and only willing participants were included. The participants were given 2 weeks to complete the questionnaire. The questionnaire was in English, and most of the employees were proficient in English, as the minimum recruitment criteria were five ordinary-level subjects, which included English. The researcher personally collected questionnaires directly from the participants to ensure confidentiality. Participants were assured that their responses would be treated with anonymity and that no names would be revealed in the study. Informed consent was obtained from the respondents before they completed the questionnaires, and voluntary participation in the study was emphasised.

Statistical analysis

In order to make sense of the data, preliminary analyses were performed. These included the use of item analyses to determine the reliability of the scales and the quality of the items comprising them. Next, the refined scales were subjected to an exploratory factor analysis (EFA) to determine the unidimensionality of each scale. Finally, the theoretical model underlying the UWES scale was tested using CFA. Confirmatory factor analysis is usually performed to determine the psychometric properties of the measurement and, more importantly, the extent to which the observed variables are true reflections of the underlying latent variables (Diamantopoulos & Siguaw, 2000; Hair et al., 2010). Confirmatory factor analysis falls under the structural equation modelling set of analyses, and in this case, LISREL 8.80 software was used to perform the analyses.

Confirmatory factor analysis was chosen instead of EFA because it allowed us to confirm the factor structure that was already given by the authors of the UWES. This factor structure was theoretically derived whereas EFA searches for structure among variables by allowing loadings between every observed variable (i.e. item or item parcel) and every factor (i.e. scale) (Williams et al., 2009). Confirmatory factor analysis is generally considered more appropriate than EFA for theory testing (Hair et al., 2010).

Results

Quantitative research instruments are often affected by participants' non-responses as they choose to respond to an item. There are various reasons attributed to this scenario, which range from failing to understand an item, deliberately omitting the item, and not believing in the contents of the item, among several other reasons. In the present study, missing values had no obvious patterns and were addressed using the multiple imputation method. This method replaces missing values with averages derived from the other responses for that case (Jöreskog & Sörbom, 1996). The final sample size was 304.

Item analysis

Item analysis was conducted on the UWES subscales to ascertain the extent to which the items contributed to the internal consistency of the scale. This was achieved using the SPSS reliability procedure (SPSS Inc., 2021) version 28 of the software. The inter-item correlations, the item-total correlations and Cronbach's Alpha if item deleted options, assisted in determining the quality of the scale items. As indicated in Table 1, all the UWES subscales had acceptable Cronbach's alpha values ($\alpha > 0.70$; Nunnally, 1978).

Dimensionality analysis

After ascertaining the reliability of the subscales, the next step was to confirm the unidimensionality of each of the three UWES subscales prior to the CFA (Williams et al., 2009). The unrestricted principal axis factor analyses with the direct oblimin rotation option were used to determine the factor structure of each of the subscales in accordance with the originally conceptualised factor structure provided by the authors of the instrument. Generally, when assessing the number of factors within a scale or subscale, the eigenvalue-greater-than-unit rule of thumb is used. The EFA per subscale indicated that all the subscales were uni-dimensional and explained more than 35% of the variances, and the factor loadings were above 0.30 (Pallant, 2016) (see Table 1).

Confirmatory factor analysis results

Confirmatory factor analysis was initially performed on the 17-item version of the UWES. One of the most informative indices of model closeness of fit, the RMSEA, indicated a

TABLE 1: Reliability and exploratory factor analysis output for the 17-item UWES dimensions.

Scale	Number of items	Cronbach's alpha	Factor loadings	Variance explained (%)
1. Vigour	6	0.78	0.55–0.68	36.20
2. Dedication	6	0.79	0.34–0.87	50.67
3. Absorption	5	0.80	0.51–0.75	42.00
Total scale	**17**	**0.92**	-	-

value of 0.102 for the first order model, indicative of poor fit. According to Diamantopoulos and Siguaw (2000), values below 0.05 indicate good fit; values between 0.05 and 0.08 indicate reasonable fit, while values above 0.08 indicate poor model fit. The standardised RMR value for the first order model was 0.0844, which was above the 0.05 cut-off indicative of a close fit. The goodness-of-fit indices (GFI) for the first order are below the 0.90 threshold. However, the Non-Normed Fit index (NNFI) = 0.95, Normed Fit index (NFI) = 0.94, Incremental Fit index (IFI) = 0.96, CFI = 0.96 and Relative Fit index (RFI) = 0.93, for the first order model, which generally indicated a good model fit. The values for the bi-factor model are illustrated in Table 2. The bi-factor model has a CFI value of 0.99. In terms of the SRMR, the bi-factor model has a value of 0.0445 indicative of good fit. The GFI values for the first order and bi-factor model missed the 0.90 cut-off. An overall look at the fit indices of the two models indicates that the bi-factor model fit indices are generally within the acceptable fit cut-off levels.

Owing to the poor model fit indices obtained for the 17-item model conceptualised using the three factors originally given by Schaufeli et al. (2002), a decision was made to test other competing models such as the 17-item uni-dimensional model, the 9-item three-factor model and the 9-item unidimensional model.

The CFA for the 17-item uni-dimensional model was subsequently performed because of the high correlations among the subscales as indicated in the phi-matrix. The RMSEA indicated a value of 0.100 indicative of poor fit. This was almost similar to the value obtained for the 17-item three factor model. The standardised RMR value of 0.0838 is above the 0.05 cut-off indicative of close fit. A GFI value of 0.746 is below the 0.90 threshold. However, the NNFI = 0.95, NFI = 0.94, IFI = 0.96, CFI = 0.96 and RFI = 0.93 generally indicated good model fit.

Given the poor model fit obtained for the 17-item models discussed above, a decision was made to conduct CFA on the corresponding 9-item models, beginning with the 9-item three-factor model, which is the short version of the original conceptualisation given by Schaufeli et al. (2002). The RMSEA value of 0.0772 indicates a reasonable fit. The standardised RMR value of 0.044 is good, as it is below the cut-off of 0.05, indicating a close fit. The GFI value of 0.93 is good, as it is above the 0.90 threshold. The NNFI = 0.98, NFI = 0.98, IFI = 0.99, CFI = 0.99 and RFI = 0.97 generally indicate a good model fit.

Confirmatory factor analysis for the 9-item unidimensional model was also performed. The RMSEA indicated a value of 0.081 indicative of poor fit. This was almost similar to the value obtained for the 17-item three factor model. The standardised RMR value of 0.0470 is indicative of a good fit, as it is below the cut-off of 0.05, indicating a close fit. The GFI value was 0.91, the NNFI = 0.98, NFI = 0.98, IFI = 0.98, CFI = 0.98 and RFI = 0.98 are generally indicating good model fit.

Table 3 contains the completely standardised factor loadings, indicating that most of the UWES 17-item questionnaire loadings were above 0.50, except for items UWES13, UWES14, UWES15, and UWES17. All factor loadings were above 0.30; hence it can be concluded that all items were reasonable indicators of their respective latent factors. Table 3 shows that six of the 17 items have higher loadings on the general factor, compared to the group factors. This indicates that although the influence of the general factor is not dominant, it still has some influence on the group factors.

Power analysis

The Rweb syntax developed by Preacher and Coffman (2006) was used to calculate the power estimates for the tests of exact and close fit using a significance level (α) of 0.05, a sample size of 304, and 116 degrees of freedom. The resulting

TABLE 3: Completely standardised factor loadings LAMBDA-X for the bifactor model (UWES, $N = 304$).

Item	General	Vigour	Dedication	Absorption
F1	0.65	0.14	-	-
F2	0.71	-	0.33	-
F3	0.65	-	-	0.13
F4	0.71	0.44	-	-
F5	0.74	-	0.45	-
F6	0.55	-	-	0.14
F7	0.71	-	0.40	-
F8	0.74	0.44	-	-
F9	0.74	-	-	0.28
F10	0.68	-	0.16	-
F11	0.71	-	-	0.08
F12	0.60	0.09	-	-
F13	0.56	-	0.41	-
F14	0.58	-	-	0.39
F15	0.59	0.39	-	-
F16	0.68	-	-	0.25
F17	0.53	0.18	-	-

F, factor loadings.

TABLE 2: Goodness-of-fit indices obtained for the UWES 17-item, 3-factor, and 1-factor first-order measurement models; 9-item 3-factor, 1-factor first order and bifactor measurement models.

Scale	Model	RMSEA	SRMR	GFI	NFI	NNFI	CFI	IFI	RFI
17-item	3-factor	0.1020	0.0844	0.765	0.942	0.948	0.956	0.956	0.933
17-item	1-factor	0.1000	0.0838	0.760	0.942	0.950	0.956	0.956	0.934
9-item	3-factor	0.0772	0.0444	0.931	0.979	0.979	0.986	0.986	0.968
9-item	1-factor	0.0809	0.0470	0.909	0.975	0.977	0.983	0.983	0.966
17-item	bifactor	0.0640	0.0445	0.880	0.970	0.980	0.990	0.990	0.960

RMSEA, root mean square error of approximation; SRMR, standardised root mean residual; GFI, goodness-of-fit index; NFI, normed fit index; NNFI, non-normed fit index; CFI, comparative fit index; IFI, incremental fit index; RFI, relative fit index.

TABLE 4: Power assessment for the measurement model for the tests of exact and close fit.

ALPHA	RMSEA (0)	RMSEA (A)	*N*	POWER	*df*
0.05	0.00	0.05	304	0.9974691	116
0.05	0.05	0.08	304	0.9989959	116

RMSEA, root mean square error of approximation; *df*, degrees of freedom.

TABLE 5: Inter-correlations between 17-item UWES latent dimensions, mean, standard deviations and average variance extracted (*N* = 304).

Subscales	M	SD	1	2	3
1. Vigour	27.97	7.481	**0.42**	0.96	0.98
2. Dedication	23.50	6.735	0.98*	**0.43**	0.84
3. Absorption	26.10	8.401	0.99*	0.92*	**0.52**

Note: *N* = 304. Phi matrix loadings (Correlations) are below the diagonal, squared correlations (shared variances) are above the diagonal and average variance extracted (AVE) estimates are presented on the diagonal.

M, mean; SD, standard deviation.

*, $p < 0.05$.

power values of 0.997 and 0.999 for the respective tests of exact fit and close fit imply that under the conditions that characterised this specific study, approximately 100% of incorrect models would be rejected (see Table 4).

Discriminant validity

A comparison of the average variance extracted (AVE) and the shared variance of the various indicator items assists in determining the discriminant validity of the scale (Farrell, 2010). According to Farrell (2010), discriminant validity is achieved when the AVE is greater than the shared variance estimates for each construct under consideration. In this case, none of the AVE estimates is greater than the shared variance, thereby indicating that the discriminant validity of the scale is not supported. This is not surprising given the high multicollinearity problem among the subscales of the 17-item version of the scale (see Table 5).

Discussion

This study sought to ascertain the reliability and construct validity of the 17-item UWES in Zimbabwe owing to the paucity of studies in this context. The Cronbach's alpha coefficients for the three dimensions of the UWES were above the minimum threshold, regarded as acceptable (Nunnally, 1978). The vigour subscale obtained a coefficient of α = 0.78, while the absorption and dedication subscales obtained coefficients of α = 0.80 and α = 0.79, respectively. When treated as a unidimensional scale, the UWES obtained a Cronbach's alpha coefficient of α = 0.92. These values are consistent with the range of estimates originally obtained by Schaufeli et al. (2002) and Rothmann (2003).

The inter-item correlation between the latent constructs obtained values of r^2 = 0.98 between vigour and dedication, r^2 = 0.99 between vigour and absorption and r^2 = 0.92 between absorption and dedication. These values corroborate the original values obtained by Schaufeli et al. (2002). The authors obtained a correlation of $r^2 > 0.90$ between the latent variables and $r^2 > 0.70$ for the observed variables. However, the inter-item correlations between the latent constructs, which were above 0.90 indicate multicollinearity. These high correlations confirm the suggestions of Sonnentag (2003) and Wefald and Downey (2009) that the UWES is better represented as a unidimensional scale and not as a three-factor structure, as initially suggested by the authors.

The three subscales of the UWES were found to be unidimensional and accounted for more than 35% of the variance. In terms of construct validity, CFA showed a poor fit for the 17-item three-factor structure (RMSEA = 0.102). An analysis of the one-factor structure of the 17-item UWES showed an RMSEA value of 0.100, which is indicative of a poor fit. These results conflict with the findings of Meng and Jin (2017), who obtained an RMSEA of 0.02 in a Chinese sample. However, several authors concede that not all factors have been invariant across the countries studied, and that there has been inconsistency in relation to the factor structure of the UWES (Sonnentag, 2003; Wefald & Downey, 2009). However, the bi-factor model for the 17-item scale has an RMSEA value of 0.064 indicative of reasonable fit. Generally, the fit indices for the bi-factor model are better than those for the first order models. An examination of the 9-item three-factor UWES showed an RMSEA value of 0.0772, indicative of a reasonable fit (Diamantopoulos & Siguaw, 2000). This result is consistent with the findings of Hallberg and Schaufeli (2006), who obtained an RMSEA of 0.07. Balducci et al. (2010) also found sound psychometric properties for the 9-item three-factor UWES.

The discriminant validity of the UWES was not supported, as indicated in Table 5. The values for the AVE are 0.42 for vigour, 0.43 for dedication and 0.52 for absorption. The shared variance values are above 0.90 for all the three subscales. For discriminant validity to be confirmed, the AVE should be above the shared variance (Farrell, 2010). The lack of support for the discriminant validity of the UWES may be explained by the high correlations between subscales.

Limitations and strengths of the study and suggestions for future research

The sample for the study comprised one group of professionals from the same industry (security officers), whose education may be limited, thereby compromising how they responded to the questionnaire. This may have affected their comprehension of some aspects of the questionnaire. This study used a non-probability convenience sample. Although the sample size was sufficiently large to assist in estimating the population parameters, the generalisability of the findings is not permissible. The sample was skewed in terms of gender and may not be representative of the Zimbabwean sample. Future studies should select representative samples across industries to generalise these findings. However, the current quantitative study is exploring a concept that has never been studied within this context.

Conclusion

Based on the item analyses and dimensional analyses output, which indicate the scales' reliability and unidimensionality, it can be inferred that the UWES meets the minimum requirements for usage in other settings. However, the results from the inter-item correlations show that all the dimensions are correlated above 0.90, suggesting that they all measure the same underlying construct. The preliminary construct validity, measured through the measurement models of the three and one-factor structures of the 17-item UWES, showed a poor fit. The measurement model of the 9-item three-factor UWES indicated a reasonable fit, while the 9-item one-factor UWES obtained a poor fit. Therefore, the UWES can be used in Zimbabwe as a unidimensional scale, given that the subscales are correlated above 0.90.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

N.G. was the project leader responsible for the data collection and article write-up. B.M. was responsible for the article write-up and statistical analyses. R.J. was also responsible for the article write-up.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of the Western Cape Research Ethics Committee on 15 April 2019. The ethics approval number is (HS18/8/9).

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Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

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