AOSIS

Exploring the factor structure of the Passion Scale: Are the dualistic types of passion relevant for workers in the South African context?

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Orientation: It is not clear from research whether the dualistic model holds true across binary ethnic and gender groups in the South African organisational context.

Research purpose: The present research aimed to test the validity and reliability of the two-factor Passion Scale and to assess for measurement invariance of the two-factor scale across binary ethnic and gender groups in the South African context.

Motivation of the study: The construct of passion helps to better understand some of the psychological attributes that contribute to experiences of either well-being or strain at work and is therefore an important attribute to measure.

Research approach, design and method: The study involved a convenience sample ($N = 550$) of managerial and staff-level South African employees from various industries with a mean age of 34 years (SD = 10.95). Confirmatory factor analysis, exploratory structural equation modelling, t-tests and tests for measurement invariance were performed.

Main findings: The results confirmed the validity and measurement invariance of the two-factor structure of the Passion Scale in the South African work context. The observed differences between the ethnic groups and men and women were practically small.

Practical/managerial implications: Well-being interventions should consider the use of the Passion Scale as a measure of the psychological attributes that explain differentiating experiences of harmonious and obsessive passion in the workplace.

Contribution/value-add: The findings provided encouraging evidence for the relevance and usefulness of the Passion Scale's dualistic model of passion for people of different binary ethnic and gender groups in South African organisations.

Keywords: harmonious passion; obsessive passion; Passion Scale; dualistic model of passion; two-factor structure of the Passion Scale in South Africa; measurement invariance of the Passion Scale.

Introduction

Employees' passion is known to fuel or hinder their motivation, work performance capability and general sense of well-being in everyday life because it is anchored in people's self-identity (Kong & Ho, 2018; Marsh et al., 2013). Passion is a noteworthy construct to explore in the modern-day, continually changing and digital-driven work context. The demand for workers who are highly flexible and agile in their capacity to adjust to new technological-driven job requirements generally increases individuals' experiences of stress resulting from cognitive and emotional strain. Such strain may negatively impact their well-being with dire consequences for the organisation and individual (Brougham & Haar, 2018). In this regard, the construct of passion helps to better understand some of the psychological attributes that contribute to the experiences of either well-being or strain at work (Vallerand et al., 2003).

The dualistic model of passion

Passion alludes to individuals' inclination towards psychological growth and the development of a self-identity through the internalisation of activities they engage in (Moeller, Keiner, & Grassinger, 2015). Individuals who are passionately engaged with their work generally

Note: This article follows the *South African Employment Equity Act*, 1998 (chapter 1[35]), when referring to 'black people' as a generic term which means African-, Coloured-, Indian- and Asian people.

perceive their work as forming a central part of their identity (Birkeland & Buch, 2015). The Passion Scale (Vallerand et al., 2003) measures two forms of passion, namely harmonious passion and obsessive passion. Harmonious passion stems from the identification with, and voluntary, autonomous internalisation of a passionate activity (e.g. work) which is seen to be in harmony with the individual's life. Although individuals with high levels of harmonious passion seem to display highly functional work behaviours, they do not allow the activities they feel passionate about to occupy an unhealthy space in their identities (Bester, 2018; Vallerand et al., 2008). On the other hand, internalisation because of internal or external constraints (e.g. an internal pressure for self-esteem or interpersonal pressure for social acceptance to engage in the work activity) leads to obsessive passion and often burnout (Forest, Mageau, Sarrazin, & Morin, 2011; Moeller et al., 2015; Vallerand, Paquet, Philippe, & Charest, 2010). The presence of strong harmonious passion is seen to counteract the negative effects of obsessive passion (Vallerand et al., 2010). One would therefore expect that both harmonious and obsessive passion would be important to measure as attributes influencing the well-being of working adults (Bester, 2018; Rousseau & Vallerand, 2008).

Generally, measuring and facilitating adult workers' passion contribute to positive outcomes, processes and attributes of organisations and its members (Cameron, Dutton, & Quinn, 2003; Forest et al., 2011). Research shows that harmonious passion is positively associated with having control over one's professional life, having fun whilst working and having career satisfaction (Bester, 2018; Forest et al., 2011). Obsessive passion is linked to lower levels of career satisfaction and subjective well-being, and cognitive strain that is associated with the tendency to take work home and not being able to stop thinking of work outside the workplace (Bester, 2018; Forest et al., 2011). Kindling employees' sense of harmonious passion and regulating their obsessive passion through employee well-being programmes amidst the complexities of functioning within a strain-inducing digital era may help people thrive in modern-day work environments (Bester, 2018; Vallerand et al., 2010).

Table 1 provides an overview of the findings of international studies that explored the psychometric properties of the Passion Scale. The studies corroborate the well-established dualistic model of passion, that is, the presence of both harmonious and obsessive passion in people's sense of self-identity (Vallerand, 2010; Vallerand et al., 2003, 2008). International research provides empirical evidence of the two-factor structure of the Passion Scale (Vallerand et al., 2003) as a measure of individuals' harmonious and obsessive passion (see Vallerand, 2010, 2015; Zhao, St-Louis, & Vallerand, 2015 for reviews). However, studies on the replication of the two-factor structure of the Passion Scale in the South African workplace context seem to be lacking. More specifically, studies on the measurement invariance of the Passion Scale for people from white and black ethnic groups are lacking. Cultural studies on the Passion Scale

TABLE 1: Studies exploring the factor structure of the Passion Scale.

International Studies	Authors	Classification or categorisation of predictors investigated	Key findings pertaining to the factor structure of the Passion Scale
Pre 2013	Rousseau, Vallerand, Ratelle, Mageau and Provencher, 2002	Utilising the passion scale to measure passion for gambling	Two-factor structure (obsessive and harmonious passion) postulated supported by ESEM and CFA
	Castelda et al., 2007	Psychometric validation of the Passion Scale in an English-speaking university sample	The two-factor structure reported by Rousseau et al. (2002) was largely replicated
	Marsh et al., 2013	Construct validity of two-factor Passion Scale	The ESEM model fit to the data was substantially better than the CFA solution, and resulted in better differentiated (less correlated) factors
2014–2017	Schellenberg, Gunnell, Mosewich and Bailis, 2014	Measurement invariance of the Passion Scale across three samples: an ESEM Approach	ESEM analysis fit the data better than the more common ICM-CFA approach
	Chamarro et al., 2015	Psychometric properties of the Spanish version of the Passion Scale	Fit for the ESEM two-factor solution (harmonious and obsessive passion) was acceptable. Near full or partial measurement invariance across sex, type of activity and age was supported
	Zhao et al., 2015	Validation the Passion Scale in Chinese	Results provided support for the two-factor structure of the Passion Scale in Chinese and for the high reliability for both subscales
	Tóth-Király, Bõthe, Rigó and Orosz, 2017	ESEM used to confirm the factor structure of the Passion Scale	Supportive evidence found for the Dualistic Model of Passion. The results revealed the superiority of the ESEM model relative to CFA in terms of improved goodness-of-fit and less correlated factors
	Zito and Colombo, 2017	Validation of the Italian version of the Passion Scale	The exploratory factor analysis revealed a two-factor structure (harmonious and obsessive passion)
2018–2020	Lajom, Amarnani, Restubog, Bordia and Tang, 2018	Dualistic Model of Passion's impact on career outcomes	CFA provided supportive evidence for the Dualistic Model of Passion
	Cid et al., 2019	Validation of the Portuguese version of the Passion Scale	Main results revealed weaknesses in the factor model for the original instrument (14 items and two factors) leading the rejection of the model. After adapting the model (eight items and two factors), the psychometric properties of the Passion Scale improved substantially
	Peixoto et al., 2019	Passion Scale: Psychometric properties and factorial invariance via ESEM	Results showed the two-factor structure of the scale, according to the theoretical hypothesis, with desirable accuracy indicators for both men and women

Note: Please see the full reference list of the article, Bester, M.S., Coetzee, M., & Van Lill, X. (2020). Exploring the factor structure of the Passion Scale: Are the dualistic types of passion relevant for workers in the South African context? *SA Journal of Industrial Psychology/SA Tydskrif vir Bedryfsielkunde, 46*(0), a1788. https://doi.org/10.4102/sajip.v46i0.1788, for more information.

CFA, confirmatory factor analysis; ESEM, exploratory structural equation model.

include assessing measurement invariance amongst people from Eastern and Western societies, and people in English, Spanish, Italian, Portuguese and Chinese speaking cultures (Castelda, Mattson, Mackillop, Anderson, & Donovick, 2007; Chamarro et al., 2015; Cid et al., 2019; Zhao et al., 2015; Zito & Colombo, 2017). The present study is the first to explore the measurement invariance of the Passion Scale for white and black, and male and female South African employees. The Passion Scale was internationally validated for men and women from both the Western and Eastern cultures (Marsh et al., 2013; Zhao et al., 2015), but not yet for employees from different ethnic and gender groups in the South African workplace. In a multicultural society such as South Africa, it is deemed important to better understand the relevance of psychometric scales for people from different ethnic and gender groups. Research shows that racial and gender identity plays an important role in psychometric assessment because of the dynamic cognitive, emotional and behavioural processes that govern individuals' interpretation of racial and gender information in their interpersonal environments. Racial and gender identity acts as cognitive-affective filters in interpreting workplace and relational conditions and events (Miller, Alvarez, Li, Chen, & Iwamoto, 2016; Peixoto, Nakano, Castillo, Oliveira, & Balbinotti, 2019).

In summary, although a multitude of empirical studies continue to support the dualistic model of passion and the validity and reliability of the harmonious and obsessive passion subscales, it is not clear from research whether the dualistic model of the Passion Scale holds true for adult workers in the South African organisational context. There is also a paucity on research assessing the measurement invariance of the two-factor Passion Scale (i.e. harmonious passion and obsessive passion) for South African working adults from different ethnic groups and those who identify themselves with either a male or female gender. The extent to which white and black people and men and women experience harmonious and obsessive passion, and whether they differ significantly regarding their experience of passion in the South African work context, has not yet been researched. The present study is a first step in exploring the validity and relevance of the dualistic types of passion (as measured by the Passion Scale of Vallerand et al., 2003) in the South African organisational context.

Purpose and aim of the study

The purpose of the present research was to test the validity and reliability of the two-factor Passion Scale (Vallerand et al., 2003) amongst a group of white and black people, and men and women employed in South African organisations. The study also aimed to assess for measurement invariance of the two-factor structure across the participating white and black employees, and men and women in order to assess for differences in a valid manner.

Research on differences between white and black people on levels of passion (as measured by the Passion Scale of Vallerand et al., 2003) seems non-existent. However, cultural studies point to the measurement equivalence of the Passion Scale for people from Eastern and Western cultures (Zhao et al., 2015). Previous research points to higher levels of passion for gambling amongst men in comparison to their female counterparts (Rousseau et al., 2002). Research by Curran, Hill, Appleton, Vallerand and Standage (2015) shows higher levels of obsessive passion for women than men. Other research indicates no significant differences between the levels of harmonious and obsessive passion for men and women (Carpentier, Mageau, & Vallerand, 2012; Orgambídez-Ramos, Borrego-Alès, & Gonçalves, 2014). However, it is not clear whether people from white and black ethnic groups, and men and women in the South African work context differ significantly regarding their types of passion, and whether potential differences can be assessed in a valid manner by means of the Passion Scale of Vallerand et al. (2003).

Considering the importance of measuring individuals' passion, this study is deemed necessary because of the potential value the findings may add to employee well-being programmes. Employees operate daily in complex technologically shape-shifting environments that create cognitive and emotional strain that affects their general well-being and work performance (Chinyamurindi, 2019). Well-being programmes that incorporate principles and measures of obsessive and harmonious passion in employee interventions may help to foster employees' general well-being and performance capability to the benefit of both the organisation and the individual (Kong & Ho, 2018; Moeller et al., 2015).

Based on the extensive research on the two-factor structure of the Passion Scale in international contexts (see Table 1, and Vallerand, 2010, 2015; Zhao et al., 2015 for reviews), the following three research hypotheses were formulated:

H1: The two-factor structure of the Passion Scale, namely harmonious and obsessive passion, can be replicated in the South African context.

H2A: People of white and black ethnic backgrounds differ significantly regarding their levels of obsessive and harmonious passion.

H2B: Men and women differ significantly regarding their levels of obsessive and harmonious passion.

H3A: The two-factor model of passion remains invariant across employees that self-identify as of white or black ethnic origins in South Africa.

H3B: The two-factor model of passion remains invariant across employees that self-identify as either men or women in South Africa.

Research design
Research approach

The study utilised a cross-sectional, quantitative research design. Cross-sectional designs are appropriate for research interested in the manifestation of a construct in

an unknown context when data are collected from numerous people at a single point in time (Spector, 2019; Zikmund, 2003).

Research method
Participants

The study involved a convenience sample (*N* = 550) of managerial- (73%) and staff-level (27%) South African employees that are of white (*n* = 83%) or black (African, coloured, Indian or Asian, *n* = 17%) ethnic origins from various industries with a mean age of 34 years (SD = 10.95). Female participants represented 54% of the sample, whilst male participants comprised 46% of the sample. Table 2 provides a more detailed breakdown of the current sample.

Measuring instrument

The two-factor Passion Scale (Vallerand et al., 2003) that was utilised for the purpose of the study composed of two self-rating subscales: Obsessive passion (six items: e.g. 'This activity is in harmony with the other activities in my work') and harmonious passion (six items: e.g. 'I have almost an obsessive feeling for this activity'). Responses on the 12 items were rated on a seven-point Likert scale, where 1 = *do not agree at all* and 7 = *very strongly agree*. Previous research confirmed the validity of the two-factor structure of the Passion Scale and good internal consistency reliability of the

harmonious passion (0.83) and obsessive passion (0.86) subscales (Marsh et al., 2013).

Procedure

Data were collected via the professional, online and social media site, namely LinkedIn. The invitation to participate in the study targeted (*N* = 1215) individuals with an electronic link to the questionnaire. The inclusion or exclusion criteria for the sample were: (1) individuals needed to be South African, (2) individuals needed to be working adults and (3) individuals needed to be 'connected' to the primary author's LinkedIn profile. A total of (*n* = 550) usable questionnaires were returned, and thus, a response rate of 45% was achieved.

Data analysis

A cross-sectional research design with a self-report measure was adopted to quantitatively investigate participants' subjective state of obsessive and harmonious passion. Several confirmatory factor models, with different latent variable structures, were specified to rule out alternative explanations for the pattern of correlations observed (Spector, 2019).

It was hypothesised (H1) that a correlated two-factor structure could be replicated in the South African context. Three different confirmatory factor (CFA) models were explored to determine whether alternative explanations existed for the loadings of the manifest variables. The analysis was performed using version 0.6–4 of the lavaan package (Rosseel, 2012; Rosseel & Jorgensen, 2019) in R. The fit of the confirmatory factor models was evaluated and compared with respect to the comparative fit index (CFI), the Tucker–Lewis index (TLI), standardised root mean square residual (SRMR) and root mean square error of approximation (RMSEA) (Brown, 2006; Hu & Bentler, 1999). The fit was considered suitable if the RMSEA and SRMR were ≤ 0.08 (Browne & Cudeck, 1992; Steiger, 1989), and the CFI and TLI were ≥ 0.90 (Bentler, 1990; Brown, 2006; Hu & Bentler, 1999; Libbrecht, Beuckelaer, Lievens, & Rockstuhl, 2014). If the difference between the CFI, SRMR and RMSEA, reflected as Δ, was greater than 0.01, then the model with the most favourable indices was regarded as superior (Vandenberg & Lance, 2000).

According to Vandenberg and Lance (2000), the chi-square (χ^2) statistic is sensitive to sample size and, as a standard measure of care, the significance level of the difference in the χ^2 statistic should be interpreted in conjunction with the differences in other indices of fit. The significance level of difference in the χ^2 statistic, in conjunction with a comparison of the differences in other indices of fit, was used to determine if the sequential factor models displayed improvement in fit. The Akaike information criterion (AIC) (Akaike, 1987) and Schwarz's Bayesian information criterion (BIC) were also used to compare the relative fit of the models, where smaller values indicated better fit (West, Taylor, & Wu, 2012).

Descriptive statistics and a Welch two-sample *T*-test (H2A & H2B) at a scale-by-scale and general passion level were conducted. Tests for assessing measurement invariance or

TABLE 2: Respondents' biographical and demographic information.

Variable	Category	Frequency	%
Ethnicity	African people	42	7.6
	Coloured people	17	3.0
	Indian- or Asian people	19	3.4
	White people	454	82.5
	Multiple ethnicity or other	18	3.2
	Total	550	100
Age	18–30 years	305	55.5
	31–45 years	122	22.1
	46–64 years	107	19.4
	65 years and older	16	2.9
	Total	550	100
Gender	Male	255	46.3
	Female	295	53.6
	Total	550	100
Education	Grade 12 (NQF level 4)	24	4.3
	Higher certificate (NQF level 5)	17	3.1
	Diploma or advanced certificate (NQF level 6)	41	7.5
	Bachelor's degree (NQF level 7)	118	21.4
	Postgraduate degree (NQF levels 8–10)	350	63.6
	Total	550	100
Tenure	1–5 years	318	57.8
	6–10 years	94	17.1
	11–20 years	79	14.3
	21 and more years	59	10.7
	Total	550	100
Job level	Staff member	150	27.2
	Management	117	21.2
	Owner or executive or c-level	283	51.4
	Total	550	100

NQF, National qualification framework.

equivalence (i.e. configural, metric, scalar and strict) of the two-factor structure (H3A & H3B) across the participating white (*n* = 454) and black (African, Coloured, Indian or Asian [*n* = 96]) ethnic groups, as well as men (*n* = 255) and women (*n* = 295), were then inspected as part of the validation process of occupational passion in South Africa. The statistical procedures were performed with version 0.5–1 of the semTools package in R (Jorgensen, Pornprasertmanit, Schoemann, & Rosseel, 2019). This investigation was firstly limited to the equivalence in participants' self-identified gender as either a man or a woman. Whilst these gender categories conform to those typically used in South Africa (Statistics South Africa, 2019), it must be acknowledged that the binary representation of gender has been challenged and that gender internationally is considered to be more fluid (Ho & Mussap, 2019; Hyde, Bigler, Joel, Tate, & Van Anders, 2019). Secondly, even though South Africa has a rich cultural background in terms of ethnic heritage (Fetvadjiev, Meiring, Van de Vijver, Nel, & Hill, 2015), the current sample size did not allow an exploration of ethnic differences in detail because of limited representation of the black cultural ethnic groups. To enable some preliminary inspection of the cross-cultural validity of the two-factor structure, we created a binary ethnic group entitled white and black ethnic origins.

Ethical consideration

Ethical clearance to conduct the study was obtained from the Research Ethics Committee of the University of South Africa (Ref #: 2016_CEMS/IOP_076). The participants gave informed consent that their research data may be used for research purposes. The participants' anonymity, voluntary participation and confidentiality were honoured at all times.

Results
Reliability and validity of the two-factor structure of the Passion Scale

A calculation of Mardia's coefficients of multivariate skewness (1477.33, *p* < 0.01) and kurtosis (19.32, *p* < 0.01) indicated that the entire set of 12 items (manifest variables) was non-normal. Given the medium (*N* = 550) sample size (see Rhemtulla, Brosseau-Liard, & Savalei, 2012), the employment of rating scales with seven numerical categories (see Beauducel & Yorck Herzberg, 2009; Rhemtulla et al., 2012) and violation of multivariate normality in the present study (see Bandalos, 2014; Satorra & Bentler, 1994; Yuan & Bentler, 1998), a confirmatory factor analysis (CFA) model with robust maximum likelihood (MLM) estimation was deemed appropriate throughout this study (see Bandalos, 2014).

Each passion dimension's overall mean, standard deviation, coefficient alpha (*α*) and coefficient omega (*ω*1) are reported in Table 5. *ω*1 can be viewed as the reliability of factors whilst controlling for the other factors (Jorgensen et al., 2019). Table 5 shows that the internal consistency reliability

(i.e. Cronbach's alpha coefficient [*α*] and the more robust coefficient omega [*ω*1]) for the obsessive and harmonious passion subscales were high (*α* and *ω*1 ≥ 0.75).

As shown in Table 3, three confirmatory factor models were specified, which contained a single-factor model, orthogonal first-order factor model and oblique lower-order model of obsessive and harmonious passion (Credé & Harms, 2015). Based on the modification indices, the residuals of items 1 and 2, as well as items 3 and 4 of obsessive passion, were correlated to provide better model-data fit for all three models. Modification indices were employed in prior studies to correlate uniqueness between the items of obsessive passion (see Marsh et al., 2013) and in this case, the wording of the items also merited it. Cross-loadings between factors in the Passion Scales in the past (see Marsh et al., 2013) were accounted for by loading item 1 of harmonious passion on obsessive passion and item 2 of obsessive passion on harmonious passion.

Table 3 shows that, for the single-factor solution, the 12 manifest variables related to harmonious and obsessive passion were specified to load on a unidimensional factor. A single-factor model was specified to determine whether a more parsimonious model provided a better fit to the data (Credé & Harms, 2015). The factor variance of the single-factor model was fixed to unity to enable the identification of a unidimensional model. By contrast, six manifest variables were specified to load on harmonious and obsessive passion, respectively, in an orthogonal first-order model. An orthogonal first-order model was specified to determine whether better fit to the data can be obtained if the two factors are uncorrelated (Credé & Harms, 2015). The factor variances were fixed to unity to enable the identification of the orthogonal first-order model. Finally, six manifest variables were specified to load on the two correlated factors, namely harmonious and obsessive passion, respectively, with the oblique lower-order model.

TABLE 3: Fit statistics for a first-order, single-factor and lower-order model of Passion.

Variable	Single factor	First order	Lower order
df	52	50	49
Δ*df*	-	2	1
x²	658.52	221.57*	173.19*
Δ*x²*	-	436.95	48.38
CFI	0.71	0.91	0.94
ΔCFI	-	0.20	0.03
TLI	0.63	0.88	0.92
SRMR	0.14	0.13	0.06
ΔSRMR	-	0.01	0.07
RMSEA	0.16	0.09	0.07
RMSEA CI	0.15; 0.17	0.08; 0.10	0.06; 0.09
ΔRMSEA	-	0.07	0.03
AIC	22 669	22 186	22 128
BIC	22 781	22 306	22 253

AIC, Akaike information criterion; BIC, Bayesian information criterion; CFI, comparative fit index; TLI, Tucker–Lewis index; SRMR, standardised root mean square residual; RMSEA, root mean square error of approximation; CI, confidence interval.
*, *p* < 0.05

Factor variances were fixed to unity to enable the identification of the oblique lower-order model. The fit statistics of each model are reported in Table 3.

The differences (Δ) in the CFI, TLI, standardised root mean squared residual (SRMR) and RMSEA reported in Table 3 convey that the oblique lower-order model provides the best fit to the data. Bifactor statistical indices were calculated through the Bifactor Indices Calculator package (Dueber, 2020) to determine whether a general factor of passion might be present. The explained common variance (ECV = 0.43), percentage of uncontaminated correlations (PUC = 0.55) and absolute relative parameter bias (ARPB = 0.66) provided greater support for a multidimensional model (Reise, Bonifay, & Haviland, 2013) or dual model of passion. The inter-factor correlations for the best fitting model (oblique lower-order factor model) are reported in Table 4.

The moderate correlation between obsessive and harmonious passion ($\phi = 0.39$) suggested the prevalence of a small degree of communality between the two factors of the Passion Scale, albeit small ($\phi = 15\%$). Marsh et al. (2013) indicate that problems related to the fit and discriminant validity of the two-factor structure of the Passion Scale could be attributed to the restrictive independent clustering of a CFA. This, according to Marsh et al. (2013), can be alleviated by allowing cross-loadings between the factors. Marsh et al. (2013) and Tóth-Király et al. (2017) recommend that an exploratory structural equation model (ESEM) might better fit the data and increase the differentiation between the two factors of the Passion Scale. The lavaan package at the time did not contain a function to perform ESEM. An ESEM was therefore conducted using the psych package (Revelle, 2019) in R. The ESEM was conducted by using the minimum residuals (MINRES) method of estimation, because of the multivariate non-normality of the data (Jöreskog, 2003), and obliman (oblique) rotation. The fit of the ESEM was satisfactory, that is, χ^2 [df] = 192.63 [43]; SRMR = 0.05; df corrected SRMR = 0.06. The factor

loadings and inter-factor correlations are also reported in Table 4 for comparative purposes.

The ESEM function in the psych package only reports indices of absolute fit. A comparison of the indices of absolute fit between the oblique lower-order model for the CFA and ESEM reveals a slight improvement in fit to the data for the ESEM model. As per the findings of Marsh et al. (2013), the item loadings across the CFA and ESEM were for the most part substantively the same. The inter-factor correlations between the CFA and ESEM were very similar, which is attributed to the modification indices implemented for the CFA model.

Measurement invariance of the Passion Scale

As a first step in determining equivalence of the scale across binary ethnic and gender participants, the descriptive statistics at a scale-by-scale level were calculated, which are reported in Table 5.

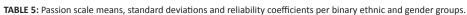## Results – Testing research hypothesis H2A

The mean difference in harmonious passion for the white participants ($M = 32.31[5.38]$, SD = 5.69[0.95]) and participants of black ethnic origins $M = 30.09[5.15]$, SD = 6.59[1.10]) was calculated with a Welch two-sample T-test. As shown in Table 5, a statistically significant result was obtained, t (126.64) = 1.95, $p = 0.05$, Cohen's $d = 0.24$, small practical effect. Similarly, the mean difference in obsessive passion for the white participants ($M = 18.58[3.10]$, SD = 7.54[1.26]) and participants from black ethnic origins ($M = 20.45[3.41]$, SD = 8.23[1.37]) was also statistically significant, t (130.98) = -2.05, $p = 0.04$, Cohen's $d = 0.24$, small practical effect. The results provided preliminary evidence for H2A: People of white and black ethnic backgrounds differ significantly regarding their levels of obsessive and harmonious passion.

Results – Testing research hypothesis H2B

The mean difference in harmonious passion for the male participants ($M = 32.44[5.41]$, SD = 5.70[0.95]) and female participants ($M = 31.74[5.29]$, SD = 6.02[1]) were statistically non-significant, t (543.36) = 1.40, $p = 0.16$, Cohen's $d = 0.12$, small practical effect. By contrast, the mean difference in obsessive passion for the male participants ($M = 19.88[3.31]$, SD = 7.52[1.25]) and female participants ($M = 18.07[3.01]$, SD = 7.75[1.29]) was practically small and statistically significant, t (539.18) = 2.77, $p < 0.05$, Cohen's $d = 0.24$, small practical effect. The results provided preliminary evidence for our research hypothesis H2B: Men and women differ significantly regarding their levels of obsessive and harmonious passion.

Results – Testing research hypotheses H3A and H3B

As a second step in determining measurement equivalence, Vandenberg and Lance's (2000) recommended sequence for conducting a test of measurement invariance (H3) across ethnic and gender groups was used. Measurement

TABLE 4: Factor loadings of confirmatory factor analysis (with medication indices) and exploratory structural equation model solutions.

Factors	Items	Oblique lower-order CFA		Oblique lower-order ESEM	
		Obsessive	Harmonious	Obsessive	Harmonious
Obsessive	-	-	0.39†	-	0.38†
	1	0.44	-	0.52	-
	2	0.57	0.23	0.72	-
	3	0.60	-	0.65	-
	4	0.57	-	0.61	-
	5	0.84	-	0.79	-
	6	0.66	-	0.63	-
Harmonious	-	-	-	-	-
	1	-0.28	0.62	-	0.52
	2	-	0.70	-	0.68
	3	-	0.76	-	0.76
	4	-	0.73	-	0.70
	5	-	0.66	-	0.70
	6	-	0.66	-	0.66

†, Inter-factor correlations.

CFA, confirmatory factor analysis; ESEM, exploratory structural equation model.

TABLE 5: Passion scale means, standard deviations and reliability coefficients per binary ethnic and gender groups.

Groups	Source of difference	Variable	Obsessive		Harmonious	
			Item	Likert-scale	Item	Likert-scale
Overall	-	Mean	18.91	3.15	32.06	5.34
		Standard deviation	7.69	1.28	5.88	0.98
		Alpha (α)	0.81	-	0.83	-
		Omega (ω1)	0.75	-	0.83	-
Ethnicity	White people	Mean	18.58	3.10	32.31	5.38
		Standard deviation	7.54	1.26	5.69	0.95
		Alpha (α)	0.80	-	0.82	-
		Omega (ω1)	0.72	-	0.82	-
	Black people	Mean	20.45	3.41	30.09	5.15
		Standard deviation	8.23	1.37	6.59	1.1
		Alpha (α)	0.84	-	0.85	-
		Omega (ω1)	0.84	-	0.85	-
Gender	Men	Mean	19.88	3.31	32.44	5.41
		Standard deviation	7.52	1.25	5.70	0.95
		Alpha (α)	0.79	-	0.82	-
		Omega (ω1)	0.72	-	0.82	-
	Women	Mean	18.07	3.01	31.74	5.29
		Standard deviation	7.75	1.29	6.02	1.00
		Alpha (α)	0.83	-	0.83	-
		Omega (ω1)	0.78	-	0.83	-

equivalence could not be performed in the psych package, and the best fitting oblique lower-order model was therefore used to inspect the invariance of the two-factor model of the Passion Scale across binary ethnic and gender groups. In this respect, the equivalence of the oblique lower-order model was determined by comparing the fit statistics of the multigroup confirmatory factor model for configural invariance (i.e. equality of the factor structure across groups), metric invariance (i.e. similar factor loadings across groups), scalar invariance (equal means across groups) and strict invariance (equal residual error variances across groups). Table 6 compares the fit statistics for the two-factor model across increasingly restrictive equality constraints.

Whilst placing more stringent equality constraints at each phase of testing invariance, the values of the ΔCFI, ΔSRMR and ΔRMSEA did not change in practically meaningful ways ($\Delta \leq 0.01$ for all comparisons) for either ethnicity or gender. Whilst the AIC values appear to be relatively the same, the smallest BIC value was reported for the model of strict invariance. The results provided supportive evidence for H3A: The two-factor model of passion remains invariant across employees that self-identify as either men or women in South Africa and H3B: The two-factor model of passion remains invariant across employees that self-identify as from white or black ethnic groups in South Africa.

Discussion

The research findings provided evidence of the reliability, validity and measurement invariance (i.e. for white and black ethnic groups and men and women) of the two-factor Passion Scale (Vallerand et al., 2003) amongst employees in South African organisations. The results corroborated previous research on the well-established Passion Scale (Vallerand et al., 2003; see also Vallerand, 2010, 2015; Zhao et al., 2015 for

TABLE 6: Changes in fit statistics for an oblique lower-order model of passion with configural, metric, scalar and strict invariance across binary ethnic and gender groups.

Variable	Statistic	Configural	Metric	Scalar	Strict
Ethnicity	df	98	110	120	132
	Δdf	-	12	10	12
	x^2	226.95	244.59	256.33	265.06
	Δx^2	-	17.64	11.74	8.73
	CFI	0.94	0.94	0.94	0.93
	ΔCFI	-	0.00	0.00	0.01
	TLI	0.92	0.92	0.93	0.93
	SRMR	0.06	0.06	0.06	0.06
	ΔSRMR	-	0.00	0.00	0.00
	RMSEA	0.07	0.07	0.07	0.07
	ΔRMSEA	-	0.00	0.00	0.00
	AIC	22 148	22 142	22 130	22 139
	BIC	22 502	22 443	22 389	22 346
Gender	df	98	110	120	132
	Δdf	-	12	10	12
	x^2	232.10	249.97	270.55	285.75
	Δx^2	-	17.87	20.58	15.2
	CFI	0.93	0.93	0.93	0.92
	ΔCFI	-	0.00	0.00	0.01
	TLI	0.91	0.92	0.92	0.92
	SRMR	0.06	0.07	0.07	0.07
	ΔSRMR	-	0.01	0.00	0.00
	RMSEA	0.08	0.07	0.07	0.07
	ΔRMSEA	-	0.01	0.00	0.00
	AIC	22 158	22 154	22 153	22 155
	BIC	22 512	22 456	22 411	22 362

CFI, comparative fit index; TLI, Tucker–Lewis index; SRMR, standardised root mean square residual; RMSEA, root mean square error of approximation. Confidence interval of RMSEA is reported in brackets. AIC, Akaike information criterion; BIC, Bayesian information criterion.
*, $p < 0.05$.

reviews) and confirmed the validity of the dualistic types of passion measured by the scale for the South African work context. Like previous research (Zhao et al., 2015), the internal consistency reliability of the dualistic model of the Passion Scale was good (alpha and omega ≥ 0.75).

Overall, the tests for measurement invariance across the white and black ethnic groups, and male and female participants confirmed the validity and relevance of the Passion Scale (Vallerand et al., 2003) for the South African organisational context. The research further suggests that differences amongst South African ethnic and gender groups could be assessed in a reliable and valid manner.

The male participants and those from the black (African, Asian, Coloured) ethnic groups scored significantly higher than their female counterparts and participants from the white ethnic groups on obsessive passion. However, the observed differences between the ethnic groups and men and women were practically small. In terms of gender, the finding could be attributed to the notion that women generally tend to have greater concerns for work–life balance because of multiple life roles as carers, child-bearers and professional workers and may therefore not overly or obsessively identify with their work activities (Takawira, 2018). The higher levels of harmonious passion for employees from the white ethnic group suggest that white employees may be more prone than the black ethnic groups to experience the engagement in work activities with a sense of ownership and free will. Harmonious passion alludes to work activities occupying an important place in people's identity. However, it does not assume exaggerated proportions to conflict with other domains of life (Peixoto et al., 2019). On the other hand, the engagement in work activities by employees from the black ethnic groups seemed to be more obsessive based on a stronger need for social acceptance-related self-esteem obtained through its practice. Obsessive passion as basis for engagement in work activities may potentially result in work–life domain conflicts (Peixoto et al., 2019). The findings may be attributed by the notion that people from a white ethnic origin generally associate more with the individualistic, autonomous Western culture, whilst people from black ethnic origins tend to associate more with a collectivist culture. In societies low on individualism, the individual self-concept is often less salient and more deeply integrated with one's place and acceptance in family, community and broader society (Glosenberg, Tracey, Behrend, Blustein, & Foster, 2019).

However, the results showed that both the white and black ethnic groups, and men and women had relatively high levels of harmonious passion which suggests that they all had a strong desire to freely engage in their work activities and were likely to willingly accept their passion for their work as important. They were also likely to regard their work involvement as an activity central to their lives. This finding suggests that South African organisations may potentially benefit from the energy and passion of both white and black ethnic groups, and men and women alike in the workplace. In agreement with previous research (Vallerand et al., 2010), the relatively low levels of obsessive passion suggest that the negative effects of this form of passion were counteracted by their high levels of harmonious passion.

Managerial implications and recommendations

The measurement of the ethnic groups' and male and female participants' harmonious passion may serve as an indicator of their personal well-being at work (Orgambídez-Ramos et al., 2014). Previous research shows positive links between career satisfaction, job satisfaction, affective commitment to work, flow in the workplace and psychological well-being (Bester, 2018; Carbonneau, Vallerand, Fernet, & Guay, 2008; Carpentier et al., 2012; Forest et al., 2011; Lavigne, Forest, & Crevier-Braud, 2012; Philippe, Vallerand, Houlfort, Lavigne, & Donahue, 2010). Research shows that enhancing harmonious passion through well-being programmes may decrease potential conflict between the work–life balance concerns that generally stem from obsessive passion and prevent symptoms of burnout over time (Carpentier et al., 2012).

It is recommended that organisational well-being interventions consider the use of the Passion Scale as a measure of the psychological attributes that explain differentiating experiences of harmonious and obsessive passion in the workplace. Incorporating the use of the scale in employee well-being programmes may be useful for understanding passion as a source of, or hindrance to employees' well-being in the workplace.

Limitations

The study findings should be interpreted with caution because of certain limitations. The cross-sectional design of the study limited the generalisability of the findings. The convenience sampling technique also limited the ability to ascertain the relevance of the Passion Scale for employees in specific South African-based occupations and industries. Future research may help to assess the robustness of the findings for employees from various population and age groups employed in different occupational contexts. Multigroup factor analysis could also be explored for managerial- and staff-level employees.

Fewer individuals from diverse ethnic groups participated in this study (African = 7.6%, Coloured = 3%; Indian = 3.4%; Asian = 3.2%). This sample therefore did not allow a test of invariance of the two-factor model across more clearly defined ethnic groups. Targeting-specific ethnic populations could help to expand the current data set to explore the cross-cultural validity of the Passion Scale in greater detail in South Africa.

Conclusion

The findings provided encouraging evidence for the relevance and usefulness of the Passion Scale's dualistic model in the South African work context. The Passion Scale

appears to be a valid and reliable measure of binary ethnic and gender groups who are employed in South African organisations. Incorporating the use of the scale in employee well-being programmes may be useful for understanding passion as a source of, or hindrance to employees' well-being in the workplace.

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