

Measurement equivalence of the South African Psychological Ownership Questionnaire for diverse South African cultural groups

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Abstract

This study determined the measurement equivalence of the South African Psychological Ownership Questionnaire (SAPOS) for black and white South African employees. Participants were a non-probability sample of 645 professional level employees from both the private and the public sector (59.4% were females, 35.2% were black and 52% were over the age of 40. Over 90% of the participants have college education qualifications and nearly 41.7% had been working in their current organisations for a period of less than 5 years). Confirmatory factor analysis and

structural equation modelling were used to analyse the data. The results indicated that factor variances appeared to be equal for the two groups although differences existed in factor loadings and covariances.

Key words: Psychological ownership, cultural groups, structural equation modeling, confirmatory factor analysis

INTRODUCTION

The key to effectively managing in the 1990s will be knowing how to install psychological ownership. It's psychological ownership that makes the competitive difference.

Brown (1989, p. 15)

Since this statement was made by Brown in 1989, numerous scholars have begun to explore the idea that, although employees might not have financial ownership in their organisation, employees might develop a sense of psychological ownership towards their organisation (Pierce, Kostova & Dirks, 2001; Pierce, Kostova & Dirks, 2003). Psychological ownership is a phenomenon that can be described as a psychological experience of an employee when that employee develops possessive feelings for the target of ownership (for example, an organisation). The presence of psychological ownership among organisational members can have a positive effect on organisational effectiveness, and this presence is seen as a potentially important predictor of employee attitudes and behaviours (Brown, 1989; Vandewalle, Van Dyne & Kostova, 1995).

However, the cultural aspects of a social context have a significant influence on psychological ownership. Although possessive feelings are universal, it is possible that individuals from different cultural groups assign different meanings to possessions in terms of viewing these possessions as part of their extended selves (Pierce et al., 2003). Therefore, it is suggested that feelings of ownership might present themselves differently across cultures. This might be the case in the South African multicultural work environment. This study sought to determine the construct equivalence of the South African Psychological Ownership Questionnaire (SAPOS) for black and white employees in South Africa.

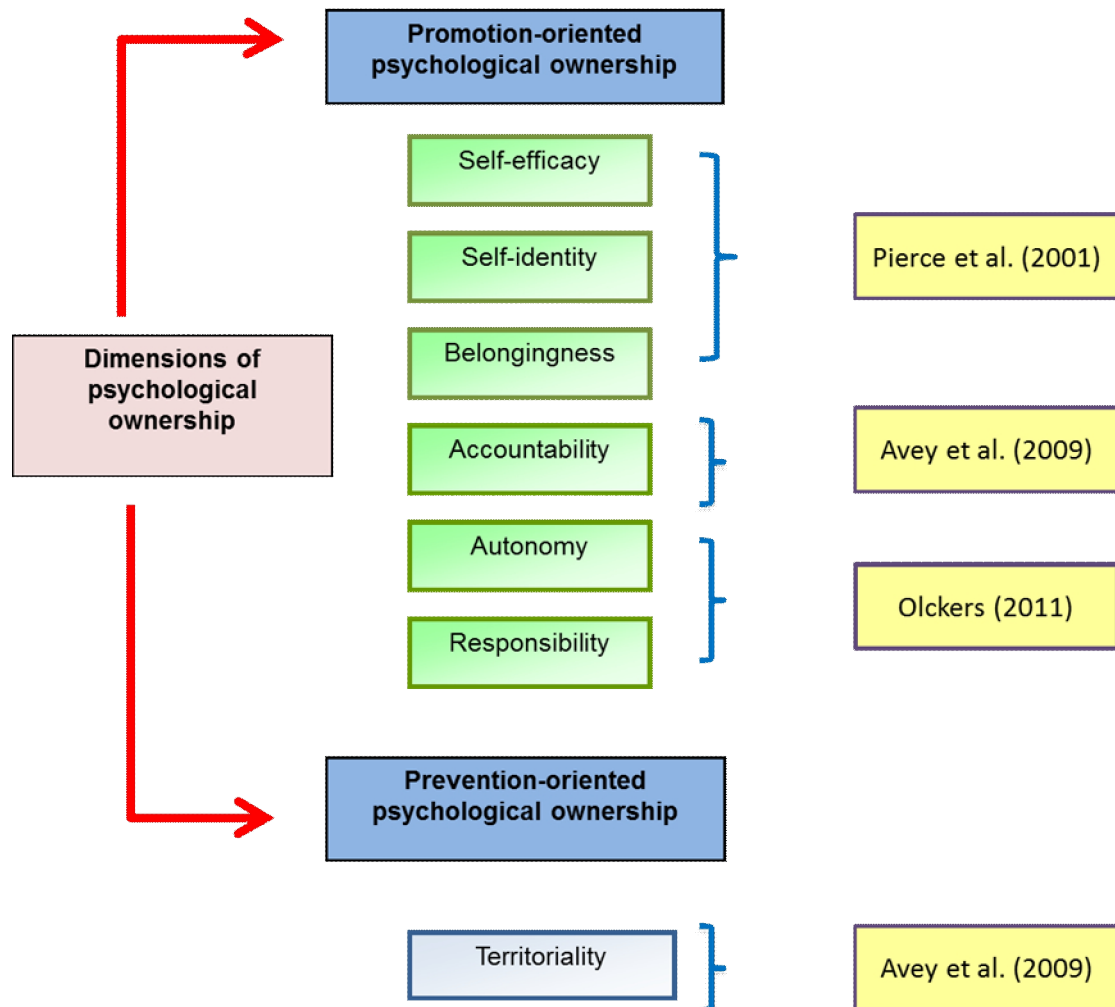
The Construct of Psychological Ownership

Psychological ownership has been described as a cognitive-affective construct based on individuals' feelings of possessiveness and of being psychologically tied or attached to objects that are material (for example, tools or work) and immaterial (for example, ideas or workspace). Psychological ownership, therefore, refers to the state of mind of individuals who feel as though the target of ownership or a piece of that target is theirs ("It is *mine!*"), and this feeling of psychological ownership reflects the individuals' "awareness, thoughts and beliefs regarding the target of ownership" (Pierce et al., 2003, p. 86). According to Van Dyne and Pierce (2004), psychological ownership asks the question, "How much do I feel this organisation is mine?"

Psychological ownership is defined by three dimensions, namely self-efficacy, self-identity and belongingness (Pierce et al., 2001). Avey, Avolio, Crossley and Luthans (2009) proposed territoriality and accountability as additional aspects of psychological ownership. Olckers and Du Plessis (2012) considered the dimensions

of autonomy and responsibility to also define psychological ownership (see Figure 1).

Figure 1: Dimensions of psychological ownership



Influences of culture

According to Pierce et al. (2003), both the kind of target and the expression of feelings of ownership towards that target will vary greatly depending on the culture and the country in which the individual operates, and on the locus of self-concept in the particular society. Individualistic societies would place more emphasis on personal successes and achievements, and would focus ownership more on their material possessions and on work that would allow them to reach personal successes and achievements. Cultures that are more collectivistic would place a

high value on the community, family and relationships. Therefore, individuals from these cultures would probably develop feelings of ownership primarily towards social targets like the community and the family. Pierce et al. (2003) therefore suggest that there are three contextual factors that influence the development of psychological ownership: culture, the term-orientation of the culture and the importance of legal ownership.

Firstly, culture will have an influence on the time it takes for psychological ownership to develop. Cultures with a shorter-term orientation will probably develop feelings of ownership more quickly than cultures with a longer-term orientation. Cultures with a longer-term orientation will need a longer time to interact with the potential target. For example, for people with a shorter-term orientation it will be much easier and less painfully to leave their organisation, to form new relationships and to switch between targets of psychological ownership since they develop feelings of ownership more quickly than people with a longer-term orientation. It will be more difficult and painful for people with a longer-term orientation to detach themselves from targets for which they felt ownership. Interaction can take place through controlling, getting to know the target and investing the self.

Secondly, Pierce et al. (2003) suspect that it will be more difficult and painful for an individual with a longer-term -orientation to decouple from targets for which he or she feels ownership. On the other hand, individuals from cultures that have a shorter-term orientation will find it much easier and less painful to move in and out of these psychological ownership relationships.

Thirdly, the relationship between legal ownership and psychological ownership might also vary across contexts. For instance, in settings where property rights are less respected and enforced, legal ownership will be less important. However, in environments where possession and property rights are strongly backed and reinforced by law and cultural values, legal ownership is likely to be more important.

According to Pierce et al. (2003), the level at which the feeling of psychological ownership resides, in other words whether it is individual or collective, is a very important aspect of the construct. They theorise that in individualistic cultures (such as the US and Australia), the feeling of ownership will tend to be experienced at an individual level. In contrast, the more the self-concept is tied to the collective entity (as in collectivistic cultures like those of China and Japan), the more psychological ownership will be defined as a shared, collective feeling. However, the empirical evidence in support of such propositions is very limited.

Behavioural consequences of psychological ownership

Pierce et al. (2001) propose that psychological ownership is associated with positive behavioural and social-psychological consequences. Psychological ownership has been associated with greater commitment to the organisation (O'Driscoll, Pierce & Coghlan, 2006; Vandewalle et al., 1995); greater accountability (Vandewalle et al., 1995); greater job satisfaction (Avey et al., 2009; Buchko, 1993;; Mayhew, Ashkanasy, Bramble Gardner, 2007; Pierce et al., 2003; Vandewalle et al., 1995; Van Dyne & Pierce, 2004); better organisational performance (Van Dyne & Pierce, 2004; Wagner, Parker & Christianson, 2003); better organisation-based self-esteem and more effort on the part of the individual to engage in organisational citizenship

behaviours (Avey et al., 2009; Vandewalle et al., 1995; Van Dyne & Pierce, 2004). Vandewalle et al. (1995) have found that psychological ownership relates positively to extra-role behaviour, which means that individuals with higher levels of psychological ownership are more likely to engage in extra-role behaviour (constructive work efforts that benefit the organisation and go beyond the required work activities). Avey et al. (2009), as well as Buchko (1993), have established a positive relationship between psychological ownership and intention to stay in the organisation. Scholars (such as Dirks, Cummings & Pierce, 1996; Kostova, 1998; Pierce et al., 2001) have further discussed the causal relationship between individuals' psychological ownership and their resistance to organisational change, their feelings of responsibility, and their willingness to take personal risks and to make personal sacrifices.

Equivalence of measures

According to Van de Vijver and Poortinga (1997), equivalence is a key concern in cross-cultural research because meaningful cross-cultural comparisons can only be made if data from different cultures are comparable. Equivalence refers to the absence of bias and describes the consequence of nuisance factors when comparing test scores across cultures (Van de Vijver and Tanzer, 1997). Berry, Poortinga, Segall and Dasen (1992) and Byrne (2008) distinguish between four types of equivalence: configural, measurement, structural, and scalar or full-score equivalence (see Table 1).

Table 1: Types of equivalence

Configural equivalence	The number of factors on a measurement scale and their loading patterns are similar across groups.
Measurement unit equivalence	Measurement scales are perceived and interpreted in the same way across groups.
Structural equivalence	The same theoretical constructs are measured in all cultural groups.
Scalar/full-score equivalence	The same construct is measured on an identical or a ratio scale.

Goals of the study

This study investigated the configural equivalence, measurement unit equivalence and structural equivalence of the **South African Psychological Ownership Questionnaire** across different cultural groups. If a sense of psychological ownership towards an organisation can be created among its employees, especially those in skilled and professional positions, by addressing the factors measured by the SAPOS, the organisation could become an enhanced workplace that would be able to sustain performance and retain staff, which would be of significant value to the organisation in these uncertain economic times.

The following questions were proposed in respect of the SAPOS:

- To what extent does the data for each cultural group fit the configural model?
- To what extent is the measurement equivalent for the different cultural groups?

METHOD

Research design

A non-experimental, cross-sectional survey design was employed for this particular study. The testing of equivalence involves following a hierarchical set of steps that starts with the testing of configural equivalence by using a configural or baseline model and is followed by the testing of measurement equivalence and structural equivalence. Testing to determine if a multi-group baseline model fits well is the first and least restrictive test to be carried out, where after increasingly restrictive parameters are to be put to the test. *“Unless it is known that the measure parameters are operating in the same way across groups, it makes no sense to test for equivalence related to the structural parameters”* (Byrne, 2008, p. 837). Testing for equivalence at various levels is an important prerequisite for determining if the underlying construct measured is comparable between sample groups in respect of the theoretical construct and the psychological meaning.

Participants and setting

Participants were a non-probability purposive sample of 645 professional level employees from various organisations in both the private and public sectors in South Africa. Detailed information about the demographic characteristics of the sample is presented in Table 2.

Table 2: Demographic information on respondents (n = 645)

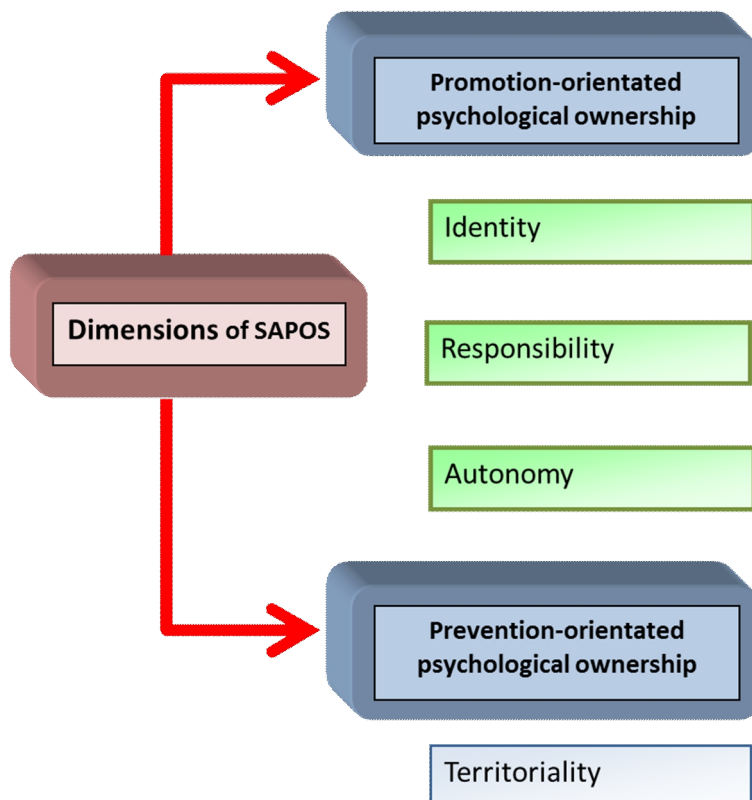
Variable	Category	Frequency	Percentage	Cumulative percentage
Gender	Male	260	40.6	40.6
	Female	381	59.4	100
	Total	641		
	Omitted data	4		
Ethnic group	Black	227	35.2	35.2
	White	418	64.8	100
	Total	645		
Age	Younger than 29	117	18.1	18.1
	30-39	193	29.9	48.1
	40-49	219	34.0	82.0
	50+	116	18.0	100
	Total	645		
Education	Grade 12	51	7.9	7.9
	Diploma	213	33.2	41.1
	Bachelor's degree	126	19.6	60.7
	Honour's degree	111	17.3	78.0
	Master's degree	97	15.1	93.1
	Doctoral degree	44	6.9	100
	Total	642		
	Omitted data	3		
Sector in which organisation operates	Financial services	85	13.2	13.2
	Chemical/Petroleum	168	26.0	39.2
	Government	161	25.0	64.2
	Manufacturing and production	106	16.4	80.6
	Other	125	19.4	100
	Total	645		
Operating level in organisation	Operations	200	31.6	31.6
	Junior management	135	21.3	52.9
	Middle management	186	29.4	82.3
	Senior management	112	17.7	100
	Total	633		
	Omitted data	12		
Years working in current organisation	Fewer than 5 years	269	41.7	41.7
	6-10 years	121	18.8	60.5
	11-20 years	152	23.6	84.0
	21+ years	103	16.0	100
	Total	645		

The sample consisted of 59.4% ($n = 381$) females, 35.2% ($n = 227$) were black and 18% ($n = 116$) were older employees over the age of 50. Over 90% of the participants have college education qualifications. Nearly 41.7% ($n = 269$) had been working in their current organisations for a period of less than 5 years.

Measures

Participants completed the South African Psychological Ownership Questionnaire (SAPOS: Olckers, (2011). The SAPOS is a 30 item-scale which comprises four factors: self-identity, responsibility, autonomy and territoriality (as displayed in Figure 2).

Figure 2: Dimensions of the South African Psychological Ownership Questionnaire (SAPOS)



It is scored on a 6-point Likert-type rating scale (1 = 'strongly disagree'; 6 = 'strongly agree'. Olckers (2011) has reported highly satisfactory reliability coefficients of 0.94 for the identity subscale; 0.87 for both the responsibility and autonomy subscales; and 0.78 for the territoriality subscale.

Research procedure

Ethical clearance was obtained from the University of Pretoria Research Ethics Committee to conduct the research. Participation in the survey was purely voluntary, and informed consent was obtained from the respondents. Data were collected by means of an electronically self-administered questionnaire, and in some cases hard copies were used. All data were dealt with in a confidential manner.

Statistical analysis

For the purpose of this study a quantitative research methodology was used. A confirmatory factor analysis (CFA) was used for the validation of the measurement model. A CFA allows the researcher to determine the number of factors that link the observed variables and the latent variables (Vorster, Olckers, Buys & Schaap, 2005). The assumptions of data normality were assessed using Mardia's normalised estimate values. According to Bentler (cited in Byrne, 2006), values of less than 5.00 indicate that data are normally distributed.

The EQS (version 6.1) software package was used for all the Structural Equation Modeling (SEM) procedures. The chi-square statistic was used to determine the extent to which the data fit the theoretical model under normal distribution assumptions. However, whenever the normal distribution assumption is not met, the

measurement model can be evaluated using a robust maximum likelihood estimate (MLE), and when distributional assumptions are violated, the Satorra-Bentler scaled chi-square statistic ($S-B\chi^2$) can be used, as was the case in this study (Byrne, 2006). According to Garson (2002), the Satorra-Bentler chi-square is a corrected chi-square that attempts to rectify the bias that is presented when the data distribution is noticeably non-normal. In addition, the following indexes were used in the study: the Comparative Fit Index (CFI), the Standardised Root Mean Square Residual (SRMR) (Hu & Bentler, 1999) and the Root Mean Square Error of Approximation (RMSEA) (Brown & Cudeck, 1993).

According to Hu and Bentler (1999), the CFI values should be equal to or greater than 0.95 for the model to be accepted. However, Marsh, Hau & Wen (2004) argue that the value of 0.95 is too restrictive and that CFI values in the range of 0.92 to 0.94 should also be considered reasonable indicators of a good model fit. Values of less than .08 for the SRMR are generally indicative of a well-fitting model (Hu & Bentler, 1999). The general guideline for RMSEA values given by Brown and Cudeck (1993) states that a value of .05 and smaller confirms that the research data support the theoretical model well. RMSEA values as high as .08 represent a reasonable fit. The RMSEA and the CFI are less sensitive to sample size; however, the acceptability of the SRMR tends to decrease with large sample sizes (Garson, 2002).

A preliminary single-group CFA was conducted as a measure to test the extent to which the data fit the proposed measurement model in respect of the two cultural groups. According to Byrne, Shavelson and Muthén (1989), it is important to

determine the fit of a model separately for each of the cultural groups before alternative hypotheses can be investigated. Thereafter, a multi-group CFA was conducted to test for measurement equivalence at configural, measurement and structural levels. A set of hierarchically nested models that successively increased the number of equality constraints was used to test the equivalence of the constructs in respect of the black and white groups. Following the guidelines suggested by Byrne (2008), constraints were imposed, starting with the equality of the configural model and followed by the equality of factor loadings. The chi-square differences determined whether the difference between the models was significant. According to Byrne (2008), if the chi-square difference test value is statistically significant for two nested models, the two models are not equivalent across groups. However, if the chi-square difference test value is statistically non-significant, all specified equality constraints are interpreted as tenable. Cheung and Rensvold (2002) suggest that, considering the tenability of the imposed constraints, a CFI difference value of no more than 0.01 would be more practical.

RESULTS

In this study, Mardia's normalised estimate of the coefficient (z-statistic) of 48.129 (for the black group) and of 64.647 (for the white group) suggested that the measured variables were not normally distributed. The robust maximum-likelihood estimate (MLE) and the Satorra-Bentler scaled chi-square were used in this study, and standard errors were adjusted (Tabachnick & Fidel, 2007).

Overall, the fit indexes, as depicted in Table 3, signify fair to good fit indexes for the white and the black groups.

Table 3: Maximum-likelihood estimates for the white and the black groups

Fit indexes	White (n= 418)	Black (n=227)
S-B χ^2	733.85	606.53
df	(399)	(399)
CFI	0.925	0.903
SRMR	0.058	0.064
RMSEA	0.044	0.048

Identity, responsibility and autonomy

The structural equation models for the four domains underlying the SAPOS for the white and the black groups are given in Figures 3 and 4 respectively.

Figure 3: Standardised estimated parameters of the SAPOS for the white group

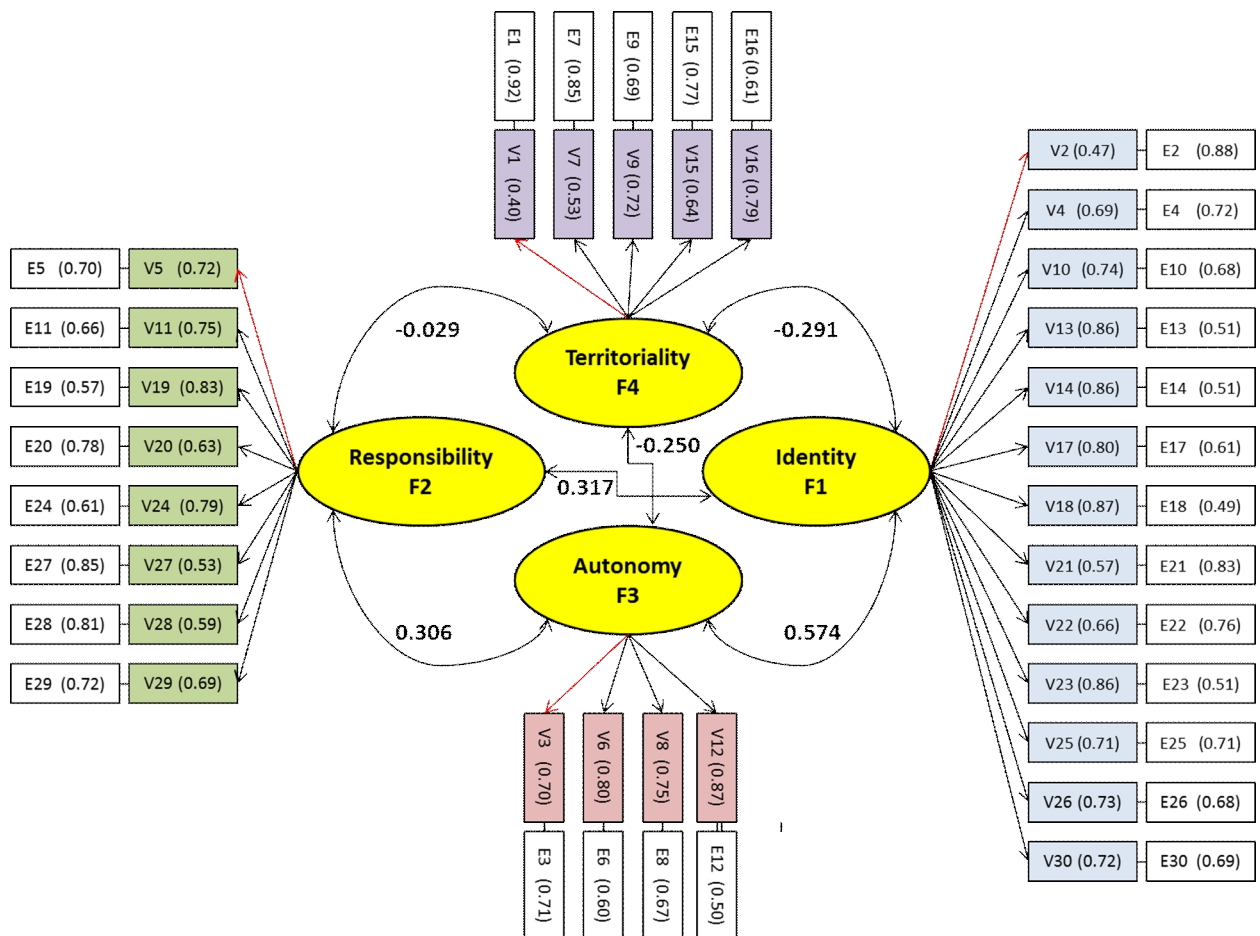
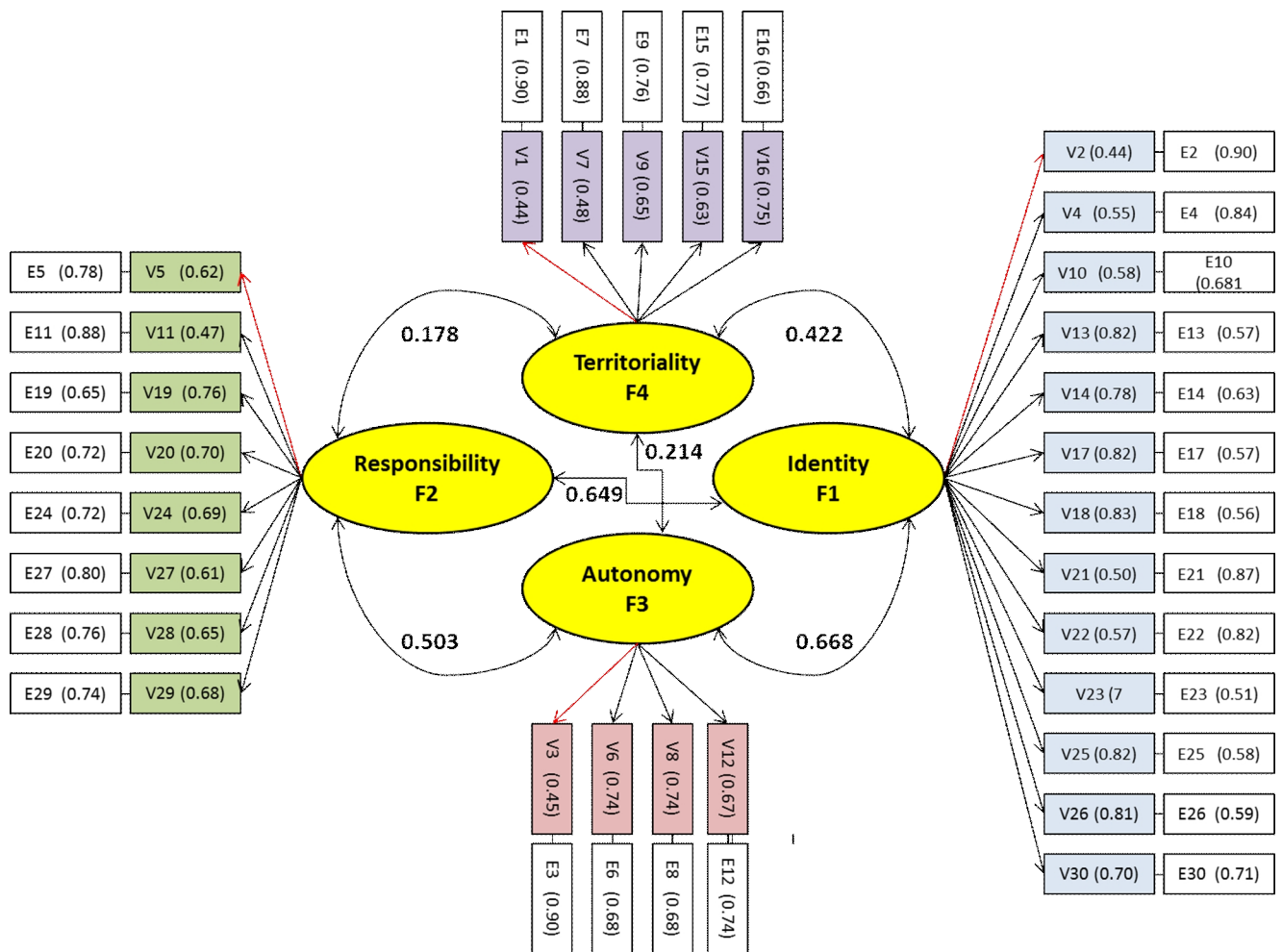


Figure 4: Standardised estimated parameters of the SAPOS for the black group



The results of the multi-group analysis are presented in Table 4. The change in the chi-square values was statistically significant for the equal factor loadings [$\Delta\chi^2(26) = 50.415$; $p > .05$] in respect of the black and the white groups. However, these changes might not be considered practically significant ($\Delta CFI = 0.006$). The EQS (version 6.1) software package does provide statistical parameters, known as the Lagrange Multiplier test (LM test), to identify more precisely which equality constraints are tenable. The LM test, which is a multivariate test of equality, pointed out the following five variables that functioned differentially across the black and the white groups:

Variable 7: I feel the need to protect my belongings from others in the organisation.

Variable 10: I feel as if this organisation is “MY” organisation.

Variable 20: I feel I should take the consequences of my work in the organisation.

Variable 25: I feel secure in this organisation.

Variable 26: I feel that I have common interests with my organisation that are stronger than our differences.

(Variable 7 is related to territoriality, whereas variables 10, 20, 25 and 26 are related to self-identity.)

Territoriality

The change in the chi-square values was statistically and practically significant for the equal factor covariances [$\Delta\chi^2(1) = 56.187; p > .05$]. The LM tests showed that the following covariances differed significantly between groups: territoriality and identity, territoriality and autonomy, responsibility and identity (see Figures 3 and 4). In respect of the white group, territoriality and identity were correlated negatively (-0.29), whereas this correlation was positive (0.422) in respect of the black group. A similar trend emerged in the case of territoriality and autonomy: these correlated negatively (-0.25) for the white group and positively (0.214) for the black group. In respect of identity and responsibility, the correlation for the black group was 0.649 and for the white group it was 0.318. Therefore, the SAPOS structural model clearly differed between the groups, which signified non-equivalent theoretical constructs.

Table 4: Results of the multi-group analysis

Model	χ^2	<i>df</i>	$\Delta\chi^2_{adj}$	Δdf	CFI	SRMR	RMSEA	ΔCFI
Nested models								
Equal factor model	1251.514	798	NA	NA	0.901	0.070	0.050	
Equal factor loadings	1303.109	824	50.415	26	0.895	0.073	0.051	0.006
Equal factor covariances	1353.397	825	56.187	1	0.885	0.138	0.052	0.010

DISCUSSION

The CFA results, based on a configural model of the SAPOS that appeared to be similar and that provided an acceptable fit for the groups, showed evidence of non-equivalence (non-invariances) related to five factor loadings and three factor covariances. The non-invariance findings might be attributed to true differences in the measurement and structure of the SAPOS, or they might be a function of particular biasing effects.

Non-invariance of measurement

Measurement non-invariance between the five factor loadings could represent true differences in the way each variable is perceived and interpreted. These differences could be from the following: differential meaning of behaviours measured (functional non-equivalence); differential psychometric properties of the scale (metric non-equivalence); method bias (bias related to data collection); and item bias (inadequate item development or translation) (Byrne, 2008).

The effect of method bias from unknown between group differences in language proficiency levels and/or response styles (for example social desirability and extremity) may explain in part the observed differences.

The non-invariance of variables between the black and the white groups might also be attributed to differences between collectivistic and individualistic societies regarding feelings of ownership and the importance of legal ownership (Pierce et al., 2003). Triandis (cited in Eaton & Louw, 2000) contends that African cultures are considered collectivist whereas Western cultures are considered individualists. Van de Vijver and Tanzer (2004, p. 124) point out that “cultural specifics” (such as “incidental differences in connotative meaning and/or appropriateness of the item content”) could lead to item bias. Variable 7, which states, “I feel the need to protect my belongings from others in the organisation”, and variable 10, which states, “I feel as if this organisation is ‘MY’ organisation”, might be considered as heavily value laden in respect of individualistic ownership of material possessions and self-interest. Strong psychological ownership of an object has been related to a greater likelihood of engaging in possessive behaviour toward that object (Brown, Lawrence & Robinson, 2005).

Non-invariance of constructs

The difference in correlations between identity and territoriality were such that the black and the white groups displayed opposite perceptions of the relationship between these constructs. Whites perceived the concept of psychological ownership rooted in identity as opposite to the concept of psychological ownership rooted in territoriality. Whites appeared to attach a negative connotation to the relationship

between psychological ownership preoccupied with “objects of ownership”, and psychological ownership related to identity. This finding appears to support the notion propounded by Avey et al. (2009) that territoriality might lead to a preoccupation with the “objects of ownership” at the expense of their performance or other pro-social behaviours, and therefore that territoriality is not related to identity in a positive sense. However, the black group’s data do not support this notion, as they see territoriality as relating positively to identity. The reason for this difference is not clear.

The perceptions of the black and the white groups as regards to the relationship between autonomy and territoriality were also quite different. Although the study provided a weak definition of this relationship, it did indicate that a positive relationship between territoriality and autonomy implied that objects of ownership might be positively associated with autonomy. Contrary to the black group, the white group attached a negative connotation to this relation.

The black group identified a significantly stronger relationship between identity and responsibility than the white group did. The reason for this is unclear.

The relations among the latent theoretical constructs (the underlying structure) have a bearing on the equivalence of the SAPOS structure for the black and the white groups, and they ultimately have a bearing on the interpretation of test scores derived from the instrument of measurement (Byrne & Watkins, 2003). The dimensional structure of the measured constructs appeared to be not equivalent for the groups included in this study.

Limitations of the study

Although the sample size was ample to conduct a factor analysis, this does not necessarily mean that the sample was representative of the general population. The sample comprised 418 white people (64.8%) and 227 black people (35.2%). Further research needs to be conducted among a broader spectrum of cultural participants (that include Coloured and Indian people) as this could have an influence on the interpretation of questions.

The sample was collected from professional, highly skilled and skilled employees in various organisations in both the private and public sectors in South Africa, and, therefore, the results obtained through the application of the SAPOS cannot necessarily be generalised to be applicable to any other countries not represented in the sample population.

Future research

The study focused on the positive aspects of psychological ownership however, according to prior research (Pierce et al., 2001; Robinson & Bennett, 1995), there is a “dark side” to psychological ownership. In this study, as in the study conducted by Avey et al. (2009), a negative side of psychological ownership, namely that which can be attached to territoriality, was acknowledged as a preventive form of psychological ownership. The role of more destructive forms of psychological ownership needs to be further explored. Such exploration might indicate, for example, that South African organisations will have to face the challenge of integrating and managing a very diverse workforce (Vorster et al., 2005), and this will necessitate organisational change. To ensure the productivity and effectiveness of

organisations, “it is necessary to get from a heterogeneous work force the same productivity, commitment, quality and profit which the organisation received from the old homogeneous work force without artificial programmes, standards, or barriers” (Roosevelt, 1990, p. 109). Dirks et al. (1996), in their psychological theory of change, argue that psychological ownership could provide insight into the reasons why and the conditions under which individuals either promote or resist change. It is important to take note that the state of psychological ownership, while potentially latent within each individual, is not equally strong in the case of all individuals, targets and situations, since it is determined by a complex interaction of many intra-individual, object-related and contextual factors (Pierce et al., 2003).

Culture, which is reflected in the customs, norms, traditions and beliefs of a society, shapes the individual’s self-concept and values with regard to control, self-expression, self-identity and ownership. Adding a qualitative dimension to the research might be valuable and could enhance knowledge about key issues that might influence psychological ownership in a diverse, multicultural environment.

Conclusion

Overall, the SAPOS was not invariant at measurement and structural levels. However, only five variables (variables 7, 10, 20, 25 and 26) appeared to contribute to differences at measurement level, and the change in CFI was relatively small and not of practical significance. Reviewing these items might further reduce the measurement invariance of the SAPOS. The effect of method bias and social desirability can, however, not be excluded as factors mitigating the non-invariance of the measurement and the underlying structure. The extent to which the impact of

method bias and social desirability influences scores will necessarily vary in different cultures (Byrne & Watkins, 2003).

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