A study to confirm the reliability and construct validity of an organisational citizenship behaviour measure on a South African sample

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Orientation: Organisational citizenship behaviour, or extra-role behaviours, are essential outcomes for the health functioning of organisations.

Research purpose: The primary goal of the study was to validate the Organisational Citizenship Behaviour Scale (OCBS) developed by Podsakoff, Mackenzie, Moorman and Fetter (1990) on a South African sample.

Motivation for the study: Organisational citizenship behaviour is one of the important workplace outcomes. A psychometrically sound instrument is therefore required.

Research design, approach and method: The sample consisted of 503 employees from the educational sector in the Eastern and Western Cape Provinces of South Africa. The OCBS was used to measure organisational citizenship behaviour.

Main findings: High levels of reliability were found for the OCBS sub-scales. The first and second-order measurement models of the OCBS showed good fit. A competing one-factor model did not show good model fit. In terms of discriminant validity four of the five sub-dimensions correlated highly.

Practical/managerial implications: Although the OCBS demonstrated some sound reliability coefficients and reasonable construct validity, the discriminant validity of four of the subscales raise some questions which future studies should confirm. The use of the instrument should help to continue to measure the much-needed extra-role behaviours that mirror an employee's interest in the success of the organisation.

Contribution/value-add: The study contributes to the requirements of the *Employment Equity Act* (*No. 55 of 1998*) and the *Amended Employment Equity Act of South Africa* (Republic of South Africa, 1998; 2014). This promotes the use of reliable and valid instruments in South Africa by confirming the psychometric properties of the OCBS.

Introduction

Organisational citizenship behaviour has long been documented as an important outcome of work behaviour (Alizadeh, Darvishi, Nazari & Emami, 2012; Davoudi, 2012; Omar, Zainal, Omar & Khairudin, 2009). Over the years, organisational citizenship behaviour has gained considerable popularity, with decades of research spanning this concept, as evidenced by the increasing number of scholarly articles on the subject (Coldwell & Callaghan, 2013; Mahembe & Engelbrecht, 2014). According to Berber and Rofcanin (2012), 125 articles on organisational citizenship behaviour were published in different scholarly journals in the period between 1990 and 2000 whilst 95 articles appeared in the period between 2000 and 2010.

OCB is essentially an enactment or display of individual extra-role behaviours that are discretionary and are not explicitly acknowledged by the formal reward system (Katz, 1964; Organ, 1988). OCBs dwell on an individual's self-leadership and self-influence behaviours, geared towards benefiting the organisation (Organ, 1988). Although these behaviours are not formally recognised, they promote the effective functioning of the organisation. Nevertheless, preferential treatment, promotions and high performance ratings are some of the tokens of the recognition of OCBs from managers (Organ, 1997).

To date several conceptualisations and definitions of organisational citizenship behaviour exist (Organ, 1988; Podsakoff, MacKenzie, Paine & Bacharach, 2000; Williams & Anderson, 1991) with the Organ (1988) conceptualisation as the most widely used (Naqshbandi & Kaur, 2011, p. 188). Organ (1988) defined OCB in terms of five dimensions (altruism, conscientiousness, sportsmanship,

TABLE 1: The dominant themes of organisational citizenship behaviour.

Researcher	Themes
Smith, Organ and Near (1983)	Altruism and generalised compliance
Organ (1988)	Altruism, conscientiousness, sportsmanship, civic virtue, courtesy
Lin (1991)	Identification with the organisation, assistance to colleagues, harmony, righteousness, discipline, self-improvement
Williams and Anderson (1991)	Organisational citizenship behaviour individual (OCBI) and Organisational citizenship behaviour organisation (OCBO)
Van Dyne, Graham and Dienesch (1994)	Loyalty, obedience, social participation, advocacy participation, functional participation
Moorman and Blakely (1995)	Interpersonal helping, individual initiative, personal industry, loyal boosterism
Van Scotter and Motowidlo (1996)	Interpersonal facilitation, job dedication
Farh, Earley and Lin (1997)	Identification with the company, altruism toward colleagues, conscientiousness, interpersonal harmony, protecting company resources
Podsakoff, MacKenzie, Paine, and Bachrach (2000)	Helping behaviours, sportsmanship and civic virtue, organisational loyalty, organisational compliance, individual initiative, self-development

Source: Adapted from Naqshbandi, M.M., & Kaur, S. (2011). A study of organizational citizenship behaviours, organizational structures and open innovation. *International Journal of Business and Social Science, 2*(6), 182–194.

courtesy and civic virtue) which form the underlying factor structure of the Podsakoff, Mackenzie, Moorman and Fetter (1990) organisational citizenship behaviour scale (OCBS). The OCBS has been validated and used in several countries including the United States, Australia, Hong Kong and China. However, studies on the reliability and construct validity of the OCBS on a South African sample are relatively sparse. This study sought to test the reliability, and construct validity[1] of the OCBS on a South African sample.

Aim of study

The main objective of the study was to determine the reliability and construct validity of the Organisational Citizenship Behaviour Scale developed by Podsakoff *et al.* (1990) on a South African sample. The specific objectives of the study were to confirm the:

- reliability of the OCBS by computing the Cronbach alpha reliability coefficients for each of the subscales.
- construct validity of the OCBS by testing the first- and second-order model goodness-of-fit using confirmatory factor analyses (CFA).
- discriminant validity of the OCBS.

Contribution to the field

Organisational citizenship behaviour might increase the efficiency of an organisation by enhancing co-worker or managerial productivity. For example, experienced employees who voluntarily help new co-workers learn to become productive employees faster, thus enhance the efficiency of the work group or unit (Alizadeh *et al.*, 2012; Mackenzie, Podsakoff, & Fetter, 1991; Podsakoff & Mackenzie, 1994). By assisting other employees, this enables the manager to spend more time on productive tasks such as strategic planning. Individuals who engage in OCB endorse and promote the organisation to outsiders and contribute to its good reputation, attracting good candidates in the process. These individuals also help the organisation adapt to the ever changing environment, for example, when employees, who are in close contact with the marketplace, volunteer information about changes in the environment and make suggestions about how to respond, they help an

organisation to adapt. This also leads to the improvement of network ties, information transfer, organisational learning and the execution of organisational activities. In short, as Podsakoff *et al.* (2000, pp. 543–546) documented OCBs can gain an organisation a competitive advantage by:

1. enhancing co-worker or manager productivity
2. freeing up resources
3. helping coordinate activities between co-workers
4. helping attract and retain the best employees
5. enhancing the organisation's ability to adapt to environmental changes
6. creating social capital (Podsakoff *et al.*, 2000).

The promotion and creation of workplace environments that foster OCBs is, therefore, vital and to ascertain whether or not organisations are correctly assessing the exhibition of OCBs, a reliable and valid instrument is, therefore, required. The major contribution of the current study lies in ascertaining the psychometric properties of one of the widely used OCB measures.

A review of the literature
Organisational citizenship behaviour dimensions

Various organisational citizenship behaviour dimensions exist depending on the type of conceptualisation chosen. The different conceptualisation themes are depicted in Table 1. The theoretical conceptualisation underlying the Podsakoff *et al.* (1990) measure is based on the Organ (1988) definition hinged on 'altruism, conscientiousness, sportsmanship, civic virtue, and courtesy'. This is arguably the most widely used conceptualisation of OCB in the literature. The Organ (1988) dimensions are defined as follows:

- **'Altruism:** Discretionary behaviours on the part of employees that have the effect of helping a specific other' with an organisationally relevant problem (Podsakoff *et al.* 1990, p. 115).
- **Conscientiousness:** Employees' discretionary behaviour that exceeds the minimum role requirements with respect to attendance, obeying rules and regulations and taking breaks (p. 115).
- **Sportsmanship:** The employees' 'willingness to tolerate less than ideal circumstances without complaining' (p. 115).

1.'Construct validation concerns the simultaneous process of measure and theory validation' (see Strauss & Smith, 2009, p. 2).

- **Courtesy:** The employees' discretionary behaviours geared towards avoiding work-related problems with others from occurring (p. 115).
- **Civic virtue:** The employees' discretionary behaviour that indicates participation and concern for the life of the company (p. 115).

Measurement of organisational citizenship behaviour

There is no universal measurement instrument with which to measure the different conceptualisations of OCB, resultant from the existence of different conceptualisations of OCB. Podsakoff *et al.* (1990) developed a measure to assess civic virtue, conscientiousness, sportsmanship, altruism and courtesy; the five dimensions originally postulated by Organ (1988). Podsakoff *et al.* (1990) developed the 24–item organisational citizenship behaviour scale using recommendations postulated by Schwab (1980) and Churchhill (1979). Q-sorts were performed on the items by 10 academic colleagues of the authors for clarity and relevance. The resultant scale was administered to employees working for a petro-chemical company with divisions in the United States, Canada and around Europe. Confirmatory factor analysis was used to test the hypothesised five-factor structure (Tucker Lewis Index = .94) (Podasakoff *et al.*, 2000). A discriminant validity test was performed to ascertain the empirical distinctiveness of the items and it was concluded that all the items were empirically distinct with the exception of the altruism which shared its variance with conscientiousness and courtesy. To date the instrument has been validated in several countries including Australia, Japan and Hong Kong (Lam, Hui & Law, 1999) and China (Hui, Lee & Rousseau, 2004). Overall, internal consistencies for the OCBS dimensions varied from α = .84 (civic virtue); α = .85 (conscientiousness); α = .87 (courtesy); α = .88 (altruism); to α = .88 (sportsmanship). Most of the studies supported the five-factor structure postulated by Podsakoff *et al.* (1990) (Naqshbandi & Kaur, 2011, p. 188).

The present study

The primary aim of the present study was to establish the reliability, construct and discriminant validity of the OCBS on a South African sample. The secondary aim was to determine the fit of the second-order model.

Research design

Research approach

The objectives set out for this study were achieved through the use of structural equation modelling (SEM). A quantitative survey design was used to achieve these research objectives.

Research method

Sample

The study was conducted using employees from the educational sector working in the Eastern and Western Cape provinces of South Africa (*N = 503*). A non-probability sampling strategy was used in the study. The sample consisted of 293 teachers from 40 schools in the Western Cape Province of South Africa and 210 employees from a university in the Eastern Cape comprising 70 lecturers, 70 administration staff and 70 support staff. It comprised female (61%) and male (39%) employees. The ethnic distribution in the sample was: black (50.7%), mixed-race (23.3%), Indian (0.2%) and white (25.6%). Regarding the highest level of qualification, the majority of respondents had a degree or diploma (88.25%).

Measuring instrument

Organisational citizenship behaviour (OCB) was measured using the Organisational Citizenship Behaviour Scale (OCBS) developed by Podsakoff *et al.* (1990). The OCBS consists of five subscales, namely: altruism, conscientiousness, sportsmanship, courtesy and civic virtue. It has demonstrated acceptable psychometric properties in previous studies (Hui, Law & Chen, 1999; Moorman, 1991; Niehoff & Moorman, 1993). The reliability coefficients for the subscales ranged from 0.70 for civic virtue to 0.85 for altruism. Items included:

- 'Helps others who have heavy workloads' (altruism)
- 'Does not take extra breaks' (conscientiousness)
- 'Consumes a lot of time complaining about trivial matters' (sportsmanship)
- 'Considers the impact of his/her actions on co-workers' (Courtesy)
- 'Attends meetings that are not mandatory, but are considered important' (civic virtue).

Research procedure and ethical considerations

The questionnaires were personally delivered to the various schools in the Western Cape Province and the academic and non-academic staff at the selected university in the Eastern Cape Province. The Organisational Citizenship Behaviour Scale consisted of a covering letter and a biographical section. The covering letter introduced the aim of the study and instructions on completing the questionnaires, as well as information concerning the participants' ethical rights. To ensure compliance with research ethical requirements, permission for the research was obtained from the institutions' research ethics committee, as well as the Department of Education. Informed consent was requested from the participants before completion of the questionnaires and confidentiality of the information and data obtained was maintained.

Statistical analysis

The data were analysed through confirmatory factor analyses (CFA) via structural equation modelling (SEM).

Structural equation modelling (SEM)

Structural Equation Modelling (SEM) is a covariance technique that explain relationships between manifest variables and their underlying latent variables (measurement models) as well as hypothesised relationships in structural models (Diamantopoulos & Siguaw, 2000).

Confirmatory factor analysis

LISREL 8.80 (Jöreskog & Sörbom, 2006) was used to perform first- and second-order confirmatory factor analysis on the OCBS to determine the fit of the model. The measurement model was considered as an exogenous model for the aims of confirmatory factor analysis. Robust maximum likelihood (RML) was used as the method of parameter estimation (Jöreskog & Sörbom, 1996).

The evaluation of the first- and second-order OCBS model

Evaluation of fit of the first- and second-order models was based on the root mean square error of approximation (RMSEA); Root Mean Squared Residual (RMR); the Goodness-of-fit index (GFI); Normed Fit Index (NFI); Non-normed Fit Index (NNFI); Comparative Fit Index (CFI); Incremental Fit Index (IFI) and the Relative Fit Index (RFI).

The root mean square error of approximation (RMSEA) is a measure of closeness of fit and is generally regarded as one of the most informative fit indices. When assessing the RMSEA, values less than 0.05 are indicative of good fit, those between 0.05 and under 0.08 of reasonable fit, values between 0.08 and 0.10 indicate mediocre fit and those above 0.10 indicate poor fit (Diamantopoulos & Siguaw, 2000).

The root mean squared residual (RMR), is a summary measure of fitted residuals and presents the average value of the difference between the sample covariance (variance) and a fitted (model-implied) covariance (variance). The disadvantage of the RMR statistic is that the RMR varies from variable to variable. This problem is resolved by concentrating on the standardised RMR. When assessing the standardised RMR, values below 0.05 are indicative of acceptable fit (Diamantopoulos & Siguaw, 2000).

The goodness-of-fit-index (GFI) shows how closely the model comes to perfectly reproduce the observed covariance matrix. Acceptable values of the GFI should range between 0 and 1 with values greater than 0.90 being interpreted as indicating acceptable fit (Diamantopoulos & Siguaw, 2000).

The normed fit index (NFI) and the non-normed fit index (NNFI) as well as the comparative fit index (CFI) should range between 0 and 1, with values closer to 1 representing good fit (Diamantopoulos & Siguaw, 2000).

Results

Missing values

Missing values were addressed using the multiple imputation method (Jöreskog & Sörbom, 2006). In this method, missing values are replaced by values derived from averages obtained via simulation (Jöreskog & Sörbom, 2006; Rubin, 1987). The use of this technique resulted in an effective sample size of 503 cases.

Evaluating the measurement models

The measurement and structural models were investigated by means of confirmatory factor analysis (CFA) and structural equation modelling through LISREL 8.80 (Du Toit & Du Toit, 2008; Jöreskog & Sörbom, 2006) to evaluate the construct validity of the measurement models. The present study intended to determine whether or not the original factor structure developed in the United States and Canada by Podsakoff *et al.* (1990) can be confirmed on a South African sample.

Multivariate normality

Jöreskog and Sörbom have established that 'the default method of estimation when fitting measurement models to continuous data (maximum likelihood) assumes multivariate normality' (Jöreskog & Sörbom, 1996). Both the null hypothesis of univariate and multivariate normality had to be rejected in the case of all the individual item indicator variables ($p < 0.01$). Thus, the use of robust maximum likelihood estimation was subsequently explored as the assumption of a multivariate normal distribution did not hold (Mels, 2003).

Item analysis

Item analysis using the SPSS Reliability procedure (SPSS Inc., 2014) was performed on the items of the Organisational Citizenship Behaviour Scale (OCBS). The internal consistency coefficients of the subscales of the OCBS were adequate ($\alpha \geq 0.70$) (Nunnally & Bernstein, 1994; Pallant, 2010) (See Table 2). The correlations amongst the five latent OCB dimensions were high above 0.90 with the exception of the sportsmanship subscale which was within reasonable limits, indicating a high possibility of multi-collinearity in the case of the other four subscales (Tabachnick & Fidell, 2001).

Goodness-of-fit of the measurement models (First-order and second-order CFA)

As indicated in Table 3, the RMSEA suggested that the first-order and second-order measurement models showed reasonable model fit with the obtained data, as values < 0.05 represent good fit whilst those between 0.05 and 0.08 indicate reasonable model fit (Diamantopoulos & Siguaw, 2000). The test of close fit indicates that the first-order model shows

TABLE 2: Descriptive Statistics and Inter-Correlations of the OCB scale scores (N = 503).

Subscales	M	SD	1	2	3	4	5
Sportsmanship	25.88	32.11	**.80**	-	-	-	-
Civic virtue	16.65	56.53	.44*	**.94**	-	-	-
Conscientiousness	21.64	10.50	.44*	.94*	**.97**	-	-
Courtesy	21.40	10.64	.45*	.93*	.96*	**.97**	-
Altruism	21.21	10.28	.44*	.95*	.95*	.96*	**.98**

M, mean; SD, standard deviation
Note: N = 503; Coefficient alphas for the scales are presented diagonally and are indicated in bold.
1, sportsmanship; 2, civic virtue; 3, conscientiousness; 4, courtesy; 5, altruism.
*, $p < .01$ (two-tailed)

TABLE 3: Goodness-of-fit indices obtained for the OCBS first-order, second-order and one factor measurement models.

Model	p-close fit	RMSEA	SRMR	GFI	NFI	NNFI	CFI	IFI	RFI
First-order CFA	0.078	0.055	0.044	0.87	0.99	0.99	0.99	0.99	0.99
Second-order CFA	0.02	0.057	0.044	0.87	0.98	0.99	0.99	0.99	0.99
One Factor model	0.00	0.088	0.061	0.78	0.98	0.98	0.98	0.98	0.98

p-close fit, p-value for test of close fit (H0: RMSEA < 0.05); RMSEA, root mean square error of approximation; SRMR, standardised root mean residual; GFI, goodness-of-fit; NFI, normed fit index; NNFI, non-normed fit index; CFI, comparative fit index; IFI, incremental fit index; RFI, relative fit index.

close fit ($p > 0.05$) whilst the second-order model does not show close fit. The standardised RMR values of 0.044 for both the first-order and second-order models reached the < 0.05 level indicative of good model fit. The GFI values for the first-order and second-order measurement models fell marginally below the 0.90 level indicative of good fit.

Goodness-of-fit of the competing one-factor OCB model

In terms of the goodness-of-fit of the competing one-factor model, the RMSEA indicates poor model fit as the value (0.088) (see Table 3) is above 0.08 cut-off level for reasonable model fit (Diamantopoulos & Siguaw, 2000). The test of close fit indicates that the one-factor model does not show close fit ($p > 0.05$). The standardised RMR values of 0.061 also indicate poor model fit whilst the relative fit measures, namely, the NFI, NNFI, CFI, IFI and RFI indices > 0.90, which represent good fit (Hair, Anderson, Black, Babin & Black, 2010; Kelloway, 1998). The GFI value of 0.78 is below the recommended cut-off value of 0.90 indicative of good fit (Diamantopoulos & Siguaw, 2000). The five-factor model appears to portray better model fit indices compared to the one-factor model.

The measurement models achieved NFI, NNFI, CFI, IFI and RFI indices > 0.90, which represents good fit (Hair *et al.*, 2010; Kelloway, 1998). These relative fit indices generally indicate good model fit.

The completely standardised factor loadings are shown in Table 4. The factor loadings of the items are generally significant (> 0.50) with the exception of one item (Item 16) for the sportsmanship subscale with a loading of 0.40. Figure 1 indicates the factors loading on each of the OCB sub-dimensions.

Parameter estimates

The unstandardised Gamma matrix depicts the significance of the estimated path coefficients which express the strength of the influence of the exogenous latent variable (OCB) on the endogenous latent variables (the manifest variables of OCB). The parameters are significant ($p < 0.05$) if t-values are $\geq |1.96|$ (Diamantopoulos & Siguaw, 2000). The t-values show that the five dimensions are significant indicators of the organisational citizenship behaviour higher-order factor, as the t-values are greater than 1.96. The results are shown in Table 5.

Power assessment

The Rweb syntax compiled by Preacher and Coffman (2006) indicated a power value of one for the test of close fit which

TABLE 4: Completely standardised solution LAMBDA-X for the first-order model.

ITEM	1	2	3	4	5
1	0.87	-	-	-	-
10	0.92	-	-	-	-
13	0.90	-	-	-	-
15	0.91	-	-	-	-
23	0.88	-	-	-	-
3	-	0.89	-	-	-
18	-	0.89	-	-	-
21	-	0.82	-	-	-
22	-	0.90	-	-	-
24	-	0.89	-	-	-
5	-	-	0.73	-	-
16	-	-	0.40	-	-
7	-	-	0.76	-	-
19	-	-	0.76	-	-
2	-	-	0.61	-	-
4	-	-	-	0.88	-
8	-	-	-	0.83	-
14	-	-	-	0.90	-
17	-	-	-	0.85	-
20	-	-	-	0.90	-
6	-	-	-	-	0.87
9	-	-	-	-	0.85
11	-	-	-	-	0.82
12	-	-	-	-	0.89

1, Altruism; 2, Conscientiousness; 3, Sportsmanship; 4, Courtesy; 5, Civic virtue.

has significant implications on the rejection of incorrect models developed and tested under more or less similar conditions.

Discriminant validity

Discriminant validity was assessed using the 95% confidence intervals utilising an Excel macro developed by Scientific Software International (Mels, 2010). The use of this macro indicates that four of the OCB subscales raise some questions regarding their discriminant validity. The conscientiousness, courtesy, civic virtue and altruism subscales in the present study correlated above the 0.90 level, and their estimates in the macro (see Table 7) are close to unity as a lack of discriminant validity is indicated by the intervals that are close to one (Mels, 2010).

Discussion

The objective of this study was to assess the reliability, construct and discriminant validity of the Organisational Citizenship Behaviour Scale developed by Podsakoff *et al.* (1990) on a South African sample.

Summary of the research results

The item analysis indicated that the reliability coefficients for each subscale of the Organisational Citizenship Behaviour
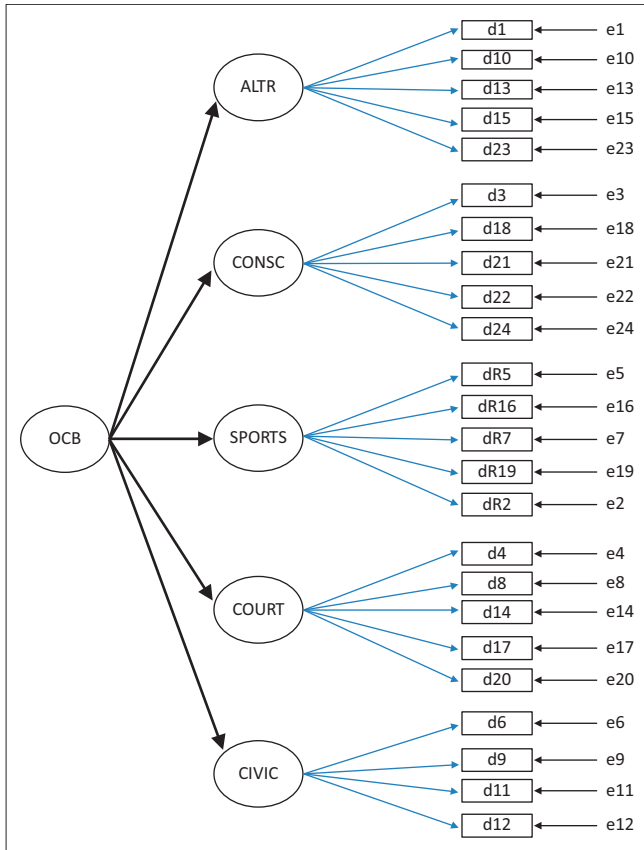
OCB, organisational citizenship behaviour; ALTR, altruism; CONSC, conscientiousness; SPORTS, sportsmanship; COURT, courtesy; CIVIC, civic virtue.

FIGURE 1: The Organisational Citizenship Behaviour Scale second-order confirmatory factor analysis path diagram indicating the five first-order factors loading onto a single second-order organisational citizenship behaviour factor.

TABLE 5: Unstandardised gamma matrix.

Variable	γ	SE	t
Altruism	0.98	0.03	30.06*
Conscientiousness	0.99	0.03	35.78*
Sportsmanship	0.60	0.05	11.18*
Courtesy	0.99	0.03	33.69*
Civic virtue	0.97	0.04	26.90*

γ, completely standardised path coefficients; SE, standard error estimates.
*, $p < 0.05$; t = t-values; t-values ≥|1.96|indicate significant parameter estimates

TABLE 6: Power assessment for the structural model for the tests of exact and close fit.

ALPHA	RMSEA(0)	RMSEA (A)	N	POWER	DF
0.05	0.00	0.05	503	1	242
0.05	0.05	0.08	503	1	247

RMSEA, root mean square error of approximation; DF, degrees of freedom

Scale are good as the Cronbach's alpha coefficients are all above the .70 level (Nunnally & Bernstein, 1994).

The first- and second-order CFA confirmed that the five manifest variables of OCB are indicative of the underlying OCB latent variable thereby demonstrating construct validity of the OCBS (Diamantopoulos & Siguaw, 2000). The five subscales were made up of a reasonable number of items defining each of the latent OCB dimensions. The second-order CFA confirmed that the five OCB dimensions contributed significantly to an overall OCB construct.

The individual factor loadings were also assessed to further determine the construct validity. Standardised loading estimates should be 0.50 or higher; preferably the standardised loadings should be 0.70 or higher (Hair *et al.*, 2010). According to this criterion, only one item, 'I tend to focus on what is wrong with my situation rather than the positive side', in the sportsmanship subscale had a value of 0.40.

The use of 95% confidence intervals utilising an Excel macro developed by Scientific Software International (Mels, 2010) showed that four of the five OCBS latent dimensions correlate too highly, leading to a lack of discriminant validity as six of the ten estimates in Table 7 appear to be approaching unity. This is echoed in the correlational results which indicate extremely high correlations amongst conscientiousness, civic virtue, altruism and courtesy dimensions. This finding is consistent with the results reported by the authors of the scale (Podsakoff *et al.* 1990).

Based on the outcomes of the current study on a South African sample of employees from the educational sector, it can be concluded that the Organisational Citizenship Behaviour Scale has acceptable construct validity. However, the conscientiousness, altruism, civic virtue and courtesy subscales correlate too highly, which raises issues concerning the discriminant validity of these scales.

Limitations of the study and suggestions for future research

Future studies should determine the measurement equivalence of the OCBS across different South African gender and cultural groups. In addition, the convergent and divergent validity of the OCB should be determined in future studies, linking the construct and its sub-dimensions with other related constructs. Furthermore, there is a need to replicate the study using public and private sector employees to establish if similar results would be obtained. Four of the subscales correlate closely in this study, which suggests a multicollinearity problem. Future studies should consider collapsing the four subscales into one dimension to improve the discriminant validity amongst the subscales.

Conclusion

The psychometric evaluation of the OCBS in the present study indicates reasonable construct validity but limited or questionable discriminant validity. The practical contribution of the study is in the advancement of the body of knowledge on the psychometric properties of the OCBS, on a sample comprising of teachers from the Western Cape and academic and non-academic members of staff at a university in the Eastern Cape Province of South Africa. The study contributes to the advancement of the use of valid and reliable instruments as required by the *Employment Equity Act (No. 55 of 1998)* and the *Amended Employment Equity Act of South Africa* (Republic of South Africa, 1998), which require all test developers and users to consider the psychometric

TABLE 7: 95% confidence interval estimates.

Variable	Altruism	Conscientiousness	Sportsmanship	Courtesy	Civic virtue
Altruism	-	-	-	-	-
Conscientiousness	0.945–0.973	-	-	-	-
Sportsmanship	0.492–0.656	0.484–0.660	-	-	-
Courtesy	0.952–0.980	0.973–0.995	0.514–0.686	-	-
Civic virtue	0.958–0.986	0.939–0.971	0.470–0.650	0.928–0.964	-

properties of measures before they can be used in South Africa. The OCBS demonstrated some promising evidence of reliability and construct validity and can contribute to the scientific selection and development of employees in South African educational institutions.

Acknowledgements

Competing interests

Authors' contributions

B.M. (University of Western Cape) was the project leader responsible for the data collection, statistical analyses and write-up of the article, whilst A.S.E. (Stellenbosch University), W.C. (University of Fort Hare) and L.R.K. (University of Fort Hare) were responsible for the data collection and article write-up.

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