

Measurement of transformational leadership in South Africa: Assessed from an etic perspective



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Orientation: It is scientifically questionable whether a predominantly Western construct and instrument could be used in the culturally diverse South African context. The sound measurement of transformational leadership in a multicultural context with the Transformational Leadership Questionnaire (TLQ), developed by Podsakoff et al. (1990), is studied from an etic perspective.

Research purpose: Our study aimed to investigate the TLQ in terms of its construct validity. The instrument was developed outside the South African and the broader African and context; our study thus adopted an etic approach.

Motivation for the study: The psychometric properties of the TLQs are examined through a contextual lens (the South African context), building on the previously conducted work of Podsakoff et al. (1990) and Podsakoff et al. (2012).

Research approach/design and method: This research employed a typical empirical paradigm using a cross-sectional design and quantitative analysis. The sample comprised 3805 respondents. A multi-factorial model was explored and confirmed using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The results support the original conceptualisation of the overall construct, but with an adjusted factorisation.

Main findings: Two factors of transformational leadership were confirmed, namely leadership focused on organisational, group and individual transformation and leadership focused on creativity and innovation. Good psychometric properties, in terms of good fit and acceptable levels of convergent and discriminant validity were reported for a two-factor model.

Practical/managerial implications: The adapted TLQ was found to be valid on structural (factorial) as well as external levels, and it was found to be reliable. The results suggest that transformational leadership could be used with confidence within the South African context.

Contribution/value-add: Our study established a valid measure of transformational leadership from an etic approach. The necessity for our study originated from the diverse nature of the South African workforce. Participants from both the private and public sectors were included in our study.

Keywords: transformational leadership; leadership; leadership measurement; etic approach; construct validity.

Introduction

Psychological research has revolved around the behaviours of WEIRD (Western, Educated, Industrialised, Rich, and Democratic) people (Espinosa & Verney, 2020), and according to Grobler and Singh (2018) can also be applied to organisational (and leadership) research in general. Syed (2021) and Syed and Kathawalla (2020) highlighted the relative absence of race, ethnicity and culture in research, specifically identifying the exclusion of structural considerations (e.g. power, privilege and context) in understanding personality. In doing so, Syed (2021) emphasises that personality encompasses more than just traits and should include structural contexts and social structures. There have been calls for research that considers culture, race and ethnicity too in personality psychology, and this has been viewed as a much-needed avenue for scholars to engage with real-world issues (Arshad & Chung, 2022; Dupree & Boykin, 2021; Roberts et al., 2020). Cheung et al. (2011) emphasise the necessity to analyse a questionnaire thoroughly for comparability across different culture groups, before any decision or prediction can be made about the construct that was measured. Psychological science tended towards excluding people from underrepresented groups (Espinosa & Verney, 2020; Syed et al., 2018). The main focus of this research is on instrument transportability and the investigation of the psychometric properties of foreign-developed instruments when used on a South African sample.

Subsequently, the focus of this research was on the measurement of transformational leadership in a diverse South African context and the soundness of the Transformational Leadership Questionnaire (TLQ), developed by Podsakoff et al. (1990), from an etic perspective. This research explored the applicability of a predominantly Western construct and instrument in a context that is extremely diverse, specifically in terms of the cultural differences found in South Africa (Nel et al., 2012; Taylor, 2004).

The original TLQ, that consisted of 22 items, identified six factors, namely *articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high-performance expectations, individualised support and intellectual stimulation*.

The universal utilisation and application of a non-South African-based instrument were investigated within the diverse South African context (etic approach). The research aimed to apply an existing instrument (TLQ) in a new context for a diverse sample to confirm the construct validity (Morris et al., 1999).

Our study has two broad objectives. Firstly, it aims to examine the TLQ in terms of construct (factorial) validity; an exploratory factor analysis (EFA) as well as confirmatory factor analysis (CFA) were used to conduct the analysis. Secondly, discriminant and convergent validity of the TLQ were investigated to assess the factorial validity of the instrument.

The contribution of this research establishes a valid measure of transformational leadership from an etic approach. The necessity of this research originates from the diverse nature of the South African workforce. Participants from both the private and public sectors participated in our study.

Literature review

Transformational leadership

The attributes of what constitutes a good leader have been a subject of discussion and research in all nationalities and societies for many decades. Bass and Riggio (2006) asserted that there is no nationality with an absolute lack of leadership and the way it is practiced is influenced by organisations and societies. The purpose of our study was not to elaborate on the theoretical meaning of transformational leadership, but merely on the validation and standardisation of the measurement thereof. It is, however, important to ensure that the concept is defined according to the operational definition of TLQ proposed by Podsakoff et al. (1990).

Podsakoff et al.'s (1990, p. 109) definition of transformational leadership refers to 'high-performance expectations – behaviour that demonstrates high expectations for excellence, quality and high performance by leaders'. In their view, transformational leaders influence behaviour by behaving as role models and portraying desirable behaviour. Employees want to mimic their role models whom they perceive in a positive light (Hu et al., 2023) and they are thereby empowered to deliver on the leader's vision.

Scholars agree that effective transformational leaders are those who change the values, beliefs and attitudes of followers in a way that they would be willing to go beyond the call of duty (Hu et al., 2023; Lian et al., 2022; Podsakoff et al., 2012; Rafferty & Griffin, 2004). These values, beliefs and attitudes are realised because of trust and loyalty to the leader (Gillespie & Mann, 2004; Hu et al., 2023). Research further attests that those followers are motivated by transformational leaders because they trust and respect them (Islam et al., 2021; Yukl, 1989). Trust in a transformational leader is regarded as an important element of followers' motivation and loyalty (Braun et al., 2013; Islam et al., 2021). Transformational leaders can instil and stimulate extra effort and a desire to go beyond the call of duty (Arnold et al., 2001; Li et al., 2019). Various studies have further demonstrated a relationship between transformational leadership and employee performance (Hasib et al., 2020; Top et al., 2020).

Measuring transformational leadership

The Multi-Factor Leadership Questionnaire (MLQ) developed by Avolio and Bass (1995) is mostly used to measure different dimensions of leadership. The MLQ has been researched and adapted to enrich and improve the soundness thereof and it is currently at version 5. The revised instrument contains 36 items, with a number of items measuring the five dimensions of transformational leadership (inspirational motivation, idealised influence, individualised consideration and intellectual stimulation).

Other instruments that are available to measure transformational leadership include the Conger–Kanungo scale (Conger & Kanungo, 1994), the Leadership Practices Inventory (LPI) (Kouzes & Posner, 1990), the Global Transformational Leadership scale (GTL) (Carless et al., 2000) and the TLQ (Alban-Metcalf & Alimo-Metcalf, 2000).

The authors, however, aimed to assess leader behaviours according to the six dimensions of transformational leadership as proposed in Podsakoff's TLQ (Podsakoff et al., 1990). This instrument was selected to be the focus of our study, because of the authors' view that it is the most suitable instrument. The decision was based on the number of items, the nature of the items (wording and general vocabulary, provided that the participants do not use English as a first language, but mostly as a second language) and the six-factor composition. The TLQ factors are, articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high-performance expectations, providing individualised support and intellectual stimulation, all of which are regarded to be relevant to the South African context. By applying this TLQ to the South African context not only was the aim to confirm the factors but also to determine whether additional factors could be identified.

Construct validity

Construct validity is regarded to be an important scientific concept while measuring any construct. It is an indication that

the intended construct is actually measured by the instrument. Benson (1998) and Clark and Watson (2019) described three necessary components for developing a strong case for construct validity, namely a substantive component, a structural component and an external component. All three are fundamental in establishing construct validity.

According to Clark and Watson (2019) the definition of the domain of interest (theoretically and supported by empirical evidence) forms the foundation of construct validity. This will ensure that all dimensions of a construct are adequately measured, through a full representation of all cognate elements, as defined by the domain of interest.

For the purpose of this research, transformational leadership (including its dimensions or sub-factors) was analysed. The results obtained would be accepted as empirically tested. It is important to observe that the construct of transformational leadership will not be evaluated from a theoretical or philosophical perspective, as our study merely assesses the existing construct, as measured by the TLQ, using an etic approach.

Construct validity in terms of its structural component involves the internal relationships among items or subscales, as measured by the instrument. The determination of the structural validity of the TLQ is one of the objectives of our study, through the use of a correlational analysis, EFA and CFA as well as reliability analyses.

The definition of validity, that consists of various types (DeVellis, 2003), was considered in the establishment of the validity of the TLQ, with the focus of our study being transformational leadership (intended construct). Thus, 'to evaluate the construct validity of a test, we must amass a variety of evidence from numerous sources' (Gregory, 2011, p. 119).

Factorial validity is another test of construct validity and is regarded to be a fairly rigorous assessment. It is based on the results of the factor analysis, which provides the underlying structure of the construct, according to Hair et al. (2013). The objective of construct and factorial validity is thus met when the expected internal structure of the construct is displayed (Moerdyk, 2022).

The convergent and discriminant validity of the TLQ were investigated, which is regarded as an important step in the determination of instrument validity (Benson, 1998; Benson & Hagtvet, 1996). This step involves the determination and inspection of correlations between the construct of interest (in this case transformational leadership) and other hypothesised, cognate and related constructs and measures.

Research design

Research approach

An empirical paradigm, using a cross-sectional design with a quantitative analysis of the responses obtained from the

questionnaires, was used for the purpose of our study. The use of a cross-sectional design fitted the purpose of our study, as it involves the sampling of respondents, as well as comparing respondents based on their association or membership to or of a specific demographic group (Leedy & Ormrod, 2014).

Research participants

The sample (N) comprised two studies in two consecutive years. The sample consists of 60 respondents per organisation. The respondents were randomly selected from 34 organisations in Study 1, and 30 organisations in Study 2.

The demographical characteristics of the respondents in terms of sector, race and gender, are reported in Table 1 (different sample sizes may be the result of the exclusion of invalid responses).

The sample of valid responses consisted of 3805 participants. Study 1 reported 2034 participants in 34 companies (53.46% of the total sample), a slightly higher representation than Study 2. Both the studies were multisectorial, with close to 64% (2428) of the respondents being from the private sector and 36% (1377) being from the public sector. In terms of the racial distribution, most of the participants were African people (57%), followed by white people (22%), Indian people (11%) and mixed-race people (9%). The representation of the gender groups was higher for males at 53% compared with 47% for females. The race and gender distribution of the sample seem to be relatively representative of the South African workforce, taking into consideration the fact that the distribution of the workforce as indicated in Statistics South Africa (2022) was 82% African people, 8% white people (slightly overrepresented in the sample), 9% mixed-race people and 3% Indian people.

In Table 2, the age and tenure characteristics of the respondents (in years) are reported.

TABLE 1: Demographical variables of the sample (N = 3805).

Category	Study 1		Study 2		Combined	
	n	%	n	%	n	%
Sector (N = 3805)						
Private	1436	70.6	992	56.0	2428	63.81
Public	598	29.4	779	44.0	1377	36.19
Race (n = 3765)						
African	1070	52.6	1087	61.4	2157	57.29
Mixed race	175	8.6	170	9.6	345	9.16
White	481	23.6	365	20.6	846	22.47
Indian	283	13.9	134	7.6	417	11.08
Gender (n = 3752)						
Male	1051	51.7	931	52.6	1982	52.83
Female	939	46.2	831	46.9	1770	47.17

TABLE 2: Age and tenure statistics of the sample (N = 3805).

Category	Study 1			Study 2			Combined		
	M	SD	n	M	SD	n	M	SD	n
Age	38.03	9.62	1999	38.39	9.52	1642	38.19	9.58	3641
Tenure	8.83	8.01	2004	8.81	7.64	1694	8.82	7.84	3698

M, mean; SD, standard deviation.

The mean age and the tenure of the respondents were 38.19 years (standard deviation [SD] = 9.58), and 8.82 years (SD = 7.84), respectively. Comparatively, Studies 1 (38.03, SD = 9.62) and 2 (38.39, SD = 9.52) reported similar mean ages and tenure (in years). The tenure across the two studies ranges was very similar, with 8.83 (SD = 8.01) and 8.81 (SD = 7.64) years in studies 1 and 2, respectively.

Statistical analysis

The statistical analysis was performed by using the Statistical Package for the Social Sciences (SPSS 25), supported by SPSS Amos (Analysis of Moment Structures).

It was deemed necessary to clean the data via case screening followed by variable screening to explain variation in the data set. This process ensured that there were no missing values in the data set. The data set was further inspected for unengaged responses by inspecting cases with a standard deviation smaller than 0.50 (SD < 0.50). The distribution of the data were analysed by means of the Central Limit Theorem, skewness and kurtosis. The data cleaning process yielded relatively few missing values and unengaged responses. Missing values and unengaged were deleted case wise, which accounted for $\pm 2\%$ of the total data set and it is therefore not considered to be a main contributor to any bias.

The appropriateness of the sample size was inspected to determine the appropriateness to conduct an EFA. Meyers et al. (2013) regard an item-to-respondent ratio of $\pm 1:20$ to be acceptable. Furthermore, the Bartlett's test of sphericity (Hair et al., 2013) was used to inspect the inter-correlations between items. A decision to conduct an EFA is based on the statistical significance ($p < 0.05$) of the Bartlett's test of sphericity (Hair et al., 2013). The Kaiser–Meyer–Olkin (KMO) measure, with a minimum value of 0.60, was also performed. This is an indication whether the items correlated sufficiently, which is a requirement for the use of an EFA.

Orthogonal rotation (specifically Promax rotation) was used to assist with the interpretation of the initial results. The Guttman–Kaiser eigenvalue greater-than-one rule (K1 rule), the scree plot (with specific reference to the shape of the curve) and, lastly, the Monte Carlo principle component analysis (PCA) for parallel analysis were used to decide about the number of factors to retain. The amount of variance explained by the factors should further be 50% or more, according to Meyers et al. (2013). A further criteria is in terms of the reliability of the factors, assessed by means of Cronbach's alpha coefficient (α), with a general rule of $\alpha \geq 0.70$ (Bernstein, 2019).

The descriptive statistics are presented in Table 3.

Considering the results in Table 3, relatively high mean scores are reported, with an indication that the data are normally distributed, as the skewness and kurtosis values exceeded the critical values of 2.00 and 7.00, respectively (West et al., 1995). The kurtosis values of the two factors,

TABLE 3: Descriptive statistics of the factors of the Transformational Leadership Questionnaire (adapted structural configuration).

Statistic	Study 1		Study 2		Combined	
	F ¹	F ²	F ¹	F ²	F ¹	F ²
Mean	3.59	3.54	3.61	3.11	3.60	3.34
SD	0.80	0.92	0.76	0.86	0.78	0.92
Skewness	0.05	0.05	-0.72	-0.26	-0.72	-0.40
Kurtosis	0.30	-0.03	-0.26	-0.13	0.40	-0.26
α	0.95	0.83	0.94	0.79	0.94	0.82
CR	-	-	-	-	0.93	0.95
AVE	-	-	-	-	0.49	0.87
MSV	-	-	-	-	0.45	0.41
ASV	-	-	-	-	0.15	0.39

Note: F¹, Leadership focused on organisational, group and individual transformation and F², Leadership focused on creativity and innovation.

AVE, average variance extracted; ASV, average shared variance; MSV, maximum shared variance; CR, composite reliability; SD, standard deviation.

across the two studies, are relatively low (ranging from -0.13 to 0.40). All the factors meet the reliability criteria of $\alpha > 0.70$ (Bernstein, 2019). Thus, it seems that the factors (that do not conform to the original factor structure of Podsakoff et al. (1990), possess acceptable levels of internal consistency.

Structural equation modelling

Transformational leadership as a construct was operationalised through a CFA that included a multidimensional model (two-factor model), as yielded by the EFA. The AMOS maximum likelihood procedure (Hair et al., 2013) was performed to examine whether a second-order (or higher order) transformational leadership factor exists, as well as the relationship between the two lower order factors.

Several fit indexes were used to assess the model fit. These include the comparative fit index (CFI), the root mean square error of approximation (RMSEA), chi-square (χ^2) and the ratio of the differences in chi-square to the differences in degrees of freedom (χ^2/df).

According to Hair et al. (2013) there are no acceptable cut-off values that constitute adequate fit for these indexes. Each model is evaluated based on the various fit index values, although it is recommended that a model must report a CFI value higher than 0.90, an RMSEA value of 0.05 and χ^2/df , a ratio of less than 5.00 or lower (Hair et al., 2013).

The first model that was evaluated was a unidimensional model with only one one-factor. All the items identified through the EFA were indicative of one larger transformational leadership factor. The second model evaluated was a first-order model. This model consists of items that load onto their respective factors (as identified and retained through the EFA process), in this case, two factors. The third model that was evaluated, is that of a second-order factor model. A second-order model (or higher order model) consists of the two factors (with the items that loaded onto them, respectively), but with the two factors loading onto a second-order latent factor, in this case, the transformational leadership factor.

To ensure that meaningful interpretations and valid cross-group comparisons can be made, invariance between the private and public sectors was performed through a basic cross-validation assessment.

Items and constructs should be interpreted in the same way across different samples (in this case, sector was used) and the variance in the observed score differences between groups should not be a result of group membership, but the construct being measured. The indexes of the CFA were used to assess the measurement invariance.

Finally, convergent validity was assessed by the composite reliability (CR) and the average variance extracted (AVE), with critical values of >0.70 and <0.5 , respectively. The discriminant validity was determined by comparing the AVE with the maximum shared variance (MSV). Proof of discriminant validity would be when $MSV < AVE$ and where the average shared variance (ASV) is less than the AVE (Hair et al., 2013).

A further assessment of convergent validity was performed through the determination and investigation into the correlation between the TLQ (and its factors) and several other similar or cognate measures. It was hypothesised, supported by previous studies and literature that transformational leadership is related to other leadership styles that are also based on work relationships. The relational leadership constructs that were included for the purpose of our study are *Authentic leadership* (Walumbwa et al., 2008) and *LMX* or leader-member-exchange (Linden & Maslyn, 1998). It is further hypothesised that transformational leadership has a positive impact on organisational behaviour, including *Loyalty* (Linden & Maslyn, 1998), *Organisational commitment* (Allen & Meyer, 1990), *Organisational citizenship behaviour* (Smith et al., 1983), *Pro-active work behaviour* (Parker & Collins, 2010) and *Trust* (Gabarro & Athos, 1978). It is further hypothesised that transformational leadership is associated with the so-called interactionist concepts, such as *Person-organisational fit*, including *Supplementary fit* or *Indirect fit* (organisation fit as values congruence) and *Complementary fit* or *Direct fit* (needs-supplies fit and demand) (Cable & DeRue, 2002; Grobler, 2016) and *Psychological contract*, on both the *self* and the *organisation level* (Freese & Schalk, 1997), impacting on the *Psychological capital* (Luthans et al., 2007; Grobler & Joubert 2018), which consists of hope, optimism, resilience and self-efficacy and *Organisational energy* (Cole et al., 2012), which has an affective, cognitive and behavioural dimension. Transformational leadership (or absence of it) would furthermore influence an employee's *Turnover intention* (Brashear et al., 2003; Grobler & Grobler, 2016).

According to Cohen et al. (2013) and Gregory (2011), it could be argued that convergence exists when correlations of 0.40 and preferably 0.50 are reported between variables.

Multiple regression was used to assess the discriminant validity of the factors. The TLQ factors will be used as

independent (or predictor) variables in multiple regression, with the hypothesised related constructs mentioned above as dependent variables. The rationale was to inspect the beta values and to determine whether discriminant validity exists through the unique contribution of the TLQ factors when the beta values are inspected.

Results

An EFA was conducted to determine the construct validity of the TLQ (from an etic approach). The EFA was conducted on the 22 items of the TLQ using the data from two studies independently, which had 2034 and 1771 respondents, respectively. Prior to running the analysis with SPSS (version 25), the data were screened by examining descriptive statistics on each item and possible univariate and multivariate assumption violations. From the initial assessment, all variables were reported to be interval-like, variable pairs appeared to be bivariate, the responses were normally distributed, and all cases were independent of one another.

The relatively large sample size contributed to adequate variable-to-case ratios (92:1 and 81:1, respectively, with the combined data set being 173:1).

In order to assess the appropriateness to conduct an EFA, the KMO measure of sampling adequacy and Bartlett's test of sphericity were performed. The results are reported in Table 4.

The value of the KMO measure of sampling adequacy exceeded the critical cut-off value of 0.60 supporting the strategy to perform an EFA. The results of the Bartlett's test of sphericity yielded Chi-square values of 28 599.89, 22 739.35 and 50 128.48 (degrees of freedom [df] = 231; all statistically significant at $p \leq 0.001$). These results are an indication that an EFA is an appropriate statistical technique to assess and evaluate construct validity. The K1 rule was further used with the scree plot to determine the number of factors to retain. The results of the K1 rule for each of the studies independently as well as the combined data set are reported in Table 5.

The factor solutions (with eigenvalues close to or larger than one) reported in Table 5 consist of two factors in Study 1 and three factors in Study 2. The total variance explained in the two studies as well as the combined data set is close to 60%. Cattell's scree test, which is aimed at retaining the components

TABLE 4: Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity.

Statistic	Study 1	Study 2	Combined
Kaiser-Meyer-Olkin measure of sampling adequacy	0.97	0.96	0.97
Bartlett's test of sphericity			
Approx. Chi-square	28599.89	22739.35	50128.48
<i>df</i>	231	231	231
Sig.	< 0.001	< 0.001	< 0.001

Approx., approximately; Sig., significant; *df*, degree of freedom.

(factors) before the break (elbow rule), was performed on all three data sets independently and the results are reported in Figure 1.

The interpretation of the scree plot, as depicted in Figure 1 was problematic, as there was one strong factor, but it is not clear in any of the three figures where the elbow flattens off.

The process to identify the correct number of factors is, according to Pallant (2020), further complicated by the conservative nature of the K1 rule as well as the scree plot.

Subsequently, the Monte Carlo parallel analysis simulation technique, which is regarded to be a more stringent technique was employed. The Monte Carlo parallel analysis aims to determine the number of factors that account for more variance than the components derived from random data. The eigenvalues obtained from the actual data are compared with the eigenvalues obtained from the random data. If the actual eigenvalues from the principal component analysis of the actual data are greater than the eigenvalues from the random data, the component (factor) is retained. Four components were included in the Monte Carlo parallel analysis to test the assumption of a two-component (factor) solution, as suggested by the interpretation of the K1 rule (Table 5). The results are reported in Table 6.

The results of the Monte Carlo parallel analysis yielded a two-component (factor) model, confirmed for the two independent studies as well as the combined data set.

TABLE 5: Eigenvalues close to or larger than 1 and explanation of variance.

Number	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings (Total)
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
Study 1							
1	11.12	50.56	50.55	11.12	50.56	50.56	11.11
2	1.64	7.48	58.03	1.64	7.48	58.03	2.69
3	0.95	4.30	62.33	-	-	-	-
4	0.80	3.63	65.97	-	-	-	-
Study 2							
1	10.14	46.09	46.09	10.14	46.09	46.09	9.90
2	1.64	7.43	53.52	1.64	7.43	53.52	5.97
3	1.39	6.34	59.86	1.39	6.34	59.86	3.33
4	0.89	4.03	63.88	-	-	-	-
Combined							
1	10.60	48.19	48.19	10.60	48.19	48.19	10.140
2	1.60	7.29	55.48	1.60	7.29	55.48	8.03
3	1.16	5.25	60.73	1.16	5.25	60.73	3.86
4	0.88	3.98	64.71	-	-	-	-

TABLE 6: Results of the Monte Carlo parallel analysis.

Number	Actual eigenvalues from PCA			Criterion value from parallel analysis			Decision based on parallel analysis			Final decision
	S ¹	S ²	C	S ¹	S ²	C	S ¹	S ²	C	
1	11.12	10.14	10.60	1.19	1.20	1.17	A	A	A	A
2	1.64	1.64	1.60	1.16	1.17	1.14	A	A	A	A
3	0.95	1.40	1.16	1.14	1.15	1.21	R	R	R	R
4	0.80	0.89	0.88	1.12	1.13	1.22	R	R	R	R

S¹, Study 1; S², Study 2; PCA, principle component analysis.

The results of the correlational analysis (Pearson correlation) between the two retained components, from now on referred to as the TLQ factors, are reported in Table 7.

Relatively high, positive correlations (ranging between 0.56 and 0.80) between the TLQ factors were reported for the two independent studies, as well as the combined data set. All the correlations thus constitute a medium to large effect and practical significance ranging between 0.56 and 0.80, supporting the notion of convergent validity (Cohen

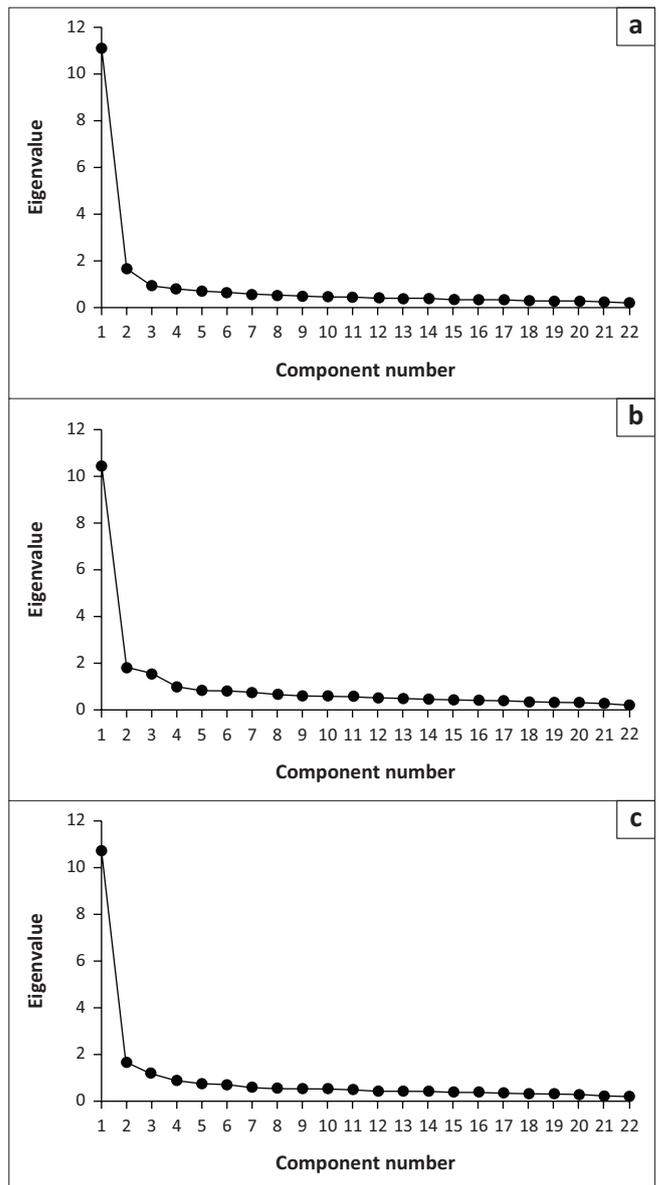


FIGURE 1: Cattell's scree plots: (a) Study 1 scree plot year 2015, (b) Study 2 scree plot year 2016, (c) Combined scree plot.

TABLE 7: Correlations (Pearson) between extracted factors (adapted structural configuration).

Factor	Study 1		Study 2		Combined	
	F ¹	F ²	F ¹	F ²	F ¹	F ²
F ¹	-	0.80*	-	0.56*	-	0.67*
F ²	0.80*	-	0.56*	-	0.67*	-

Note: F¹, Leadership focused on organisational, group and transformation; F², Leadership focused on creativity and innovation.

*, Correlation is significant at the 0.01 level (2-tailed).

TABLE 8: Factor loadings (Promax rotation) and the descriptive statistics of the items.

Question number	Study 1		Study 2		Combined		Factor loading
	Mean	SD	Mean	SD	Mean	SD	
Factor¹: Leadership focused on organisational, group and transformation							
TLQ ⁴	3.42	1.13	3.45	1.03	3.43	1.09	0.47
TLQ ⁵	3.93	0.94	3.87	0.91	3.90	0.93	0.82
TLQ ⁶	3.55	1.05	3.53	1.02	3.54	1.03	0.63
TLQ ⁸	3.74	1.05	3.87	0.95	3.80	1.01	0.62
TLQ ⁹	3.43	1.17	3.50	1.10	3.46	1.14	0.56
TLQ ¹⁰	3.67	1.03	3.66	1.02	3.67	1.02	0.69
TLQ ¹¹	3.68	1.08	3.69	0.99	3.68	1.04	0.64
TLQ ¹³	3.48	1.05	3.44	0.97	3.46	1.01	0.48
TLQ ¹⁶	3.37	1.08	3.44	1.03	3.41	1.06	0.67
TLQ ¹⁷	3.85	0.95	3.83	0.96	3.84	0.96	1.03
TLQ ¹⁸	3.45	1.03	3.42	0.96	3.43	1.00	0.67
TLQ ¹⁹	3.47	1.11	3.52	1.05	3.49	1.08	0.68
TLQ ²⁰	3.51	1.10	3.57	1.06	3.54	1.08	0.71
TLQ ²¹	3.71	1.01	3.69	0.98	3.70	1.00	0.93
TLQ ²²	3.57	1.17	3.60	1.10	3.58	1.14	0.68
Factor²: Leadership focused on creativity and innovation							
TLQ ¹	3.53	1.07	3.40	0.98	3.47	1.03	0.88
TLQ ²	3.59	1.07	3.09	1.07	3.36	1.10	0.87
TLQ ³	3.49	1.05	2.86	1.03	3.19	1.09	1.04

TLQ, transformational leadership questionnaire; SD, standard deviation.

et al., 2013). The structure coefficients from the Promax rotation are reported in Table 8.

The results of the factor analysis conducted on the TLQ are summarised in Table 8. As proposed by Meyers et al. (2013), the inclusion criteria for an item was a factor loading cut-off point of 0.40. The factor solution differs from the original 5 factor solution with 22 items of Podsakoff et al. (1990). Eighteen of the 22 items of the TLQ loaded on the two factors. The items excluded (items 7, 12, 14, 15) were analysed but no clear reason (based on theoretical alignment and language, vocabulary considerations) could be found for their exclusion (except a relatively low factor loading). It was decided to continue with the 18 items that met the criteria.

The items loaded in a quite different manner compared with the original configuration reported by Podsakoff et al. (1990). The communalities of the items, across the two studies, although not reported in Table 8, are relatively high, ranging between 0.73 and 0.43, 0.75 and 0.46 and 0.74 and 0.50 for the two studies, respectively, as well as the combined data set.

Construct validity (specifically factorial validity) was assessed through an CFA. The results of the three models tested are reported in Table 9.

TABLE 9: Comparison of a priori Transformational Leadership Questionnaire two-factor structure (the adapted factor structure of the Transformational Leadership Questionnaire).

Structure	χ^2	df	χ^2/df	$\Delta\chi^2$	CFI	RMSEA
One-factor model _a †	1140	131	8.70	-	0.98	0.045
First-order factor model _b	303	54	5.60	837 _{a-b} *	0.99	0.035
Second-order factor model _c	423	80	5.30	717 _{a-c} *	0.99	0.034

Note: All Chi-square values are significant at $p < 0.001$; the $\Delta\chi^2$ is in relation to the one-factor model_a, model_b, model_c.

CFI, comparative fit index; RMSEA, root mean square error of approximation; df, degree of freedom.

*, $p < 0.01$ (two-tailed).

†, all 18 items as determined using the exploratory factor analysis.

The three models were evaluated based on an inspection of the respective fit of the CFA. The worst fitting model was the one-factor model (all 18 items) (CFI = 0.98, RMSEA = 0.045) (model_a). The second-order factor model (model_b) is marginally better than the first-order factor model by analysing the chi-square test values. The difference in chi-square between the second-order factor and first-order factor models is 120 (i.e. 837 – 717), which is distributed as chi-square with 80 – 54 = 26 degrees of freedom. The second-order model (model_c) is thus the best fitting model. The 18 items loaded directly on their respective factors (i.e. *Leadership focused on organisational, group and individual transformation* and *Leadership focused on creativity and innovation*) which then contributes to a higher order or secondary factor, namely transformational leadership.

Furthermore, elementary cross-validation analysis was performed to assess the possibility of invariance between the two sample groups, namely the private and public sectors. The sample was split into the two sectors, using 500 cases randomly selected from each sector (from the total sample consisting of 2034 and 1771 respondents from the two sectors, respectively). The results reported for the two sample groups were χ^2/df (237) = 2.97, CFI = 0.98, TLI = 0.97, RMSEA = 0.04, ECVI = 0.42 and χ^2/df (243) = 3.05, CFI = 0.99, TLI = 0.97, RMSEA = 0.05, ECVI = 0.43 for the private and public sectors, respectively. The degree of invariance in terms of the Likelihood Ratio Test is 0.08 (3.05–2.97), and similar values were reported for TLI (0.97), which is lower than the norm of 0.05. The ECVI values for the private and public sectors are 0.42 and 0.43, respectively (difference = 0.01), which is marginal.

In addition to the comparison of the sectors, it was deemed necessary to determine invariance, using the management and non-management groups. The sample was divided into 1000 cases each for the management and non-management groups (randomly selected from the total sample). The results reported for the two sample groups were χ^2/df (251) = 3.14, CFI = 0.99, TLI = 0.98, RMSEA = 0.04, ECVI = 0.34 and χ^2/df (210) = 2.64, CFI = 0.99, TLI = 0.98, RMSEA = 0.04, ECVI = 0.39 for the management and non-management groups, respectively. The degree of invariance in terms of the likelihood ratio test is 0.52 (3.14–2.62) and similar values were reported for TLI (0.98). The ECVI values for the two groups are marginal with a difference of 0.05 (0.39–0.34). The comparison of the four

sample groups by means of cross-validation, lend support to the notion of invariance, regardless of the level or role (management and non-management) of the participants.

In addition to the CR, AVE, MSV and ASV that looked at the convergent and discriminant validity in terms of the TLQ items that loaded on each of the factors, the convergent and discriminant validity of the two factors were also determined. The convergent validity of the TLQ factors was investigated by means of a heterotrait-mono method coefficient (HTMM coefficients) by comparing the TLQ factors and the total transformational leadership score to a range of cognate constructs.

All the selected instruments that measure the cognate constructs were evaluated (based on previous research) on their psychometric properties, specifically the Cronbach's alpha coefficients (all reported $\alpha > 0.70$), are: *Authentic leadership* (Walumbwa et al., 2008) (Studies 1 and 2); *Employee engagement* (Schaufeli et al., 2006) (Study 1); *LMX* or leader-member-exchange (Linden & Maslyn, 1998) (Studies 1 and 2); *Organisational energy* (Cole et al., 2012) (Study 2); *Perceived organisational support* (Eisenberger et al., 1986) (Study 1); *Person-organisational fit*, including *Supplementary fit* and *Complementary fit* (Cable & DeRue, 2002; Grobler, 2016a) (Studies 1 and 2); *Psychological capital* (Grobler & Joubert, 2018; Luthans et al., 2007) (Study 2); *Psychological contract*, on both the *self* and the *organisation level* (Freese & Schalk, 1997) (Studies 1 and 2); *Pro-active work behaviour* (Parker & Collins, 2010) (Study 2) and lastly *Turnover intention* (Brashear et al., 2003; Grobler & Grobler, 2016) (Study 1 and 2).

The Pearson product moment correlations are reported in Table 10.

It is apparent that there is some degree of convergence through the inspection of the correlations (all $p \leq 0.001$) in Table 10. This is specifically true in terms of the hypothesised relationship between transformational leadership and its two factors, included in the table as F¹: *Leadership focused on organisational,*

TABLE 10: Convergent validity of the Transformational Leadership Questionnaire factors through hetero trait-mono method comparison (in alphabetical order).

Constructs	Study 1			Study 2			Combined		
	F ¹	F ²	Tot	F ¹	F ²	Tot	F ¹	F ²	Tot
AL	0.69	0.63	0.70	0.65	0.54	0.64	0.67	0.64	0.71
EE	0.38	0.37	0.39	-	-	-	-	-	-
LMX	0.73	0.65	0.73	0.66	0.52	0.63	0.74	0.65	0.73
OE	-	-	-	-	0.49	0.32	-	-	-
PoS	0.27	0.28	0.29	-	-	-	-	-	-
PoF	0.46	0.45	0.48	0.46	0.38	0.45	0.46	0.40	0.47
PsyCap	-	-	-	0.36	0.27	0.33	-	-	-
PsyCon	0.42	0.38	0.42	0.41	0.32	0.39	0.41	0.36	0.42
ProAct	-	-	-	0.39	0.27	0.35	-	-	-
Ti	-0.37	-0.42	-0.37	-0.37	-0.22	-0.31	-0.36	-0.30	-0.36

Note: All correlations are significant at the $p \leq 0.001$ level (2-tailed), except where indicated as n/s. F¹, Leadership focused on organisational, group and transformation; F², Leadership focused on creativity and innovation and Tot, Transformational leadership total score.

AL, authentic leadership; EE, employee engagement; LMX, leader-member exchange; OE, organisational energy; PoS, perceived organisational support; PoF, person-organisational fit; PsyCap, psychological capital; PsyCon, psychological contract; ProAct, pro-active work behaviour; Ti, turnover intention.

group and individual transformation and F²: *Leadership focused on creativity and innovation*, and related leadership constructs. *Authentic leadership* reported high correlations (r ranging from 0.54 to 0.71 for the factors and TFL total score), which is similar to that of *LMX* with r ranging from 0.52 to 0.74.

It was further hypothesised that transformational leadership would have a positive impact on organisational behaviour, which is true for *Employee engagement* in Study 1 ($r = 0.38, 0.37$ and 0.39) and *Proactive work behaviour* in Study 2 with r ranging from 0.27 to 0.39.

High correlations were found between the two TLQ factors and the interactionist concepts, with *Person organisational fit* ranging from $r = 0.38$ to 0.48. *Psychological contract* reported high correlations across the two studies with r ranging from 0.32 to 0.42. A relatively high, negative correlation between the TLQ factors and *Turnover intention* was reported (ranging from $r = -0.22$ to -0.37).

A further determination of discriminant validity was conducted through multiple regression, with the TLQ factors, *Leadership focused on organisational, group and individual transformation* and *Leadership focused on creativity and innovation* being regarded independent or predictor variables. The rationale for this analysis is to determine the uniqueness of the contribution (after inspection of the difference in the beta values), which is an indication of discriminant validity. The results are reported in Table 11 (standard errors are not included because of the limited space in the table and because of the fact that the matter of interest for discriminant validity is the difference in beta values).

All the multiple regression results, as reported in Table 11, are statistically significant ($p \leq 0.05$). The results support the notion of discriminant validity, as the two TLQ factors (F¹: *Leadership focused on organisational, group and individual transformation* and F²: *Leadership focused on creativity and innovation*) contribute uniquely to the multiple regression models in terms of the variance accounted for in the dependent variables if the magnitude of beta values are compared.

Discussion

The purpose of our study was to examine the instrument properties of the TLQ of Podsakoff et al. (1990), which consists of 22 items, and six factors (*articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high performance expectations, individualised support and intellectual stimulation*), within the South African context. Our study comprises a well-representative sample across two independent studies. Our study adopts an etic approach, as the TLQ is an imported instrument that is now being scrutinised and adapted for use within a specific context, in this case South Africa. It is important that any measurement,

TABLE 11: Discriminant validity of the Transformational Leadership Questionnaire factors.

Dependent variables	Independent variables/predictors								
	Study 1			Study 2			Combined		
	β		R^2	β		R^2	β		R^2
	F ¹	F ²		F ¹	F ²		F ¹	F ²	
AL	0.51	0.22	0.50	0.55	0.14	0.44	0.43	0.35	0.51
EE	0.25	0.17	0.16	-	-	-	-	-	-
LMX	0.57	0.20	0.55	0.60	0.08	0.44	0.60	0.17	0.56
OE	-	-	-	0.57	-0.10	0.25	-	-	-
PoS	0.13	0.18	0.08	-	-	-	-	-	-
PoF	0.29	0.22	0.23	0.41	0.08	0.22	0.35	0.17	0.23
PsyCap	-	-	-	0.34	0.02	0.13	-	-	-
PsyCon	0.30	0.15	0.18	0.37	0.04	0.17	0.31	0.15	0.43
ProAct	-	-	-	0.42	-0.04	0.15	-	-	-
Ti	-0.26	-0.13	0.14	-0.47	0.13	0.14	-0.29	-0.11	0.14

Note: Study 1: F¹, leadership focused on organisational, group and transformation; F², leadership focused on creativity and innovation and Tot, transformational leadership total score.

AL, authentic leadership; EE, employee engagement; LMX, leader-member exchange; OE, organisational energy; PoS, perceived organisational support; PoF, person-organisational fit; PsyCap, psychological capital; PsyCon, psychological contract; ProAct, pro-active work behaviour and Ti, turnover intention.

specifically in such a diverse country such as South Africa, is validated for that specific context. Subsequently, our study is based on two broad objectives. The first objective is the determination of the construct (factorial) validity of transformational leadership, as measured by the TLQ. The second objective is to assess the discriminant and convergent validity of the TLQ.

Exploratory factor analysis and CFA were used to determine the construct validity and specifically the underlying structure using the original version of the TLQ (22 items). The use of an EFA was supported by the results of Bartlett's test of sphericity and the KMO. A two-factor solution emerged and was retained after conducting the EFA with Promax rotation, explaining close to 60% of the variance (on average across the two studies independently, as well as in the combined study). The Monte Carlo parallel analysis simulation also supported the two-factor solution.

Acceptable psychometric properties were reported for the two factors (with α ranging between 0.79 and 0.95). A new naming convention that is descriptive of the two new factors was developed. The factors were named in accordance with the unique item composition, which differs significantly from the original instrument. The first factor, *Leadership focused on organisational, group and individual transformation* contributed to the most variance explained in transformational leadership with 48% and the 15 items that loaded on this factor are from all the original factors, and not in a specific order or pattern. The second factor, called *Leadership focused on creativity and innovation* contributed 8% to the explanation of the variance in the overall construct and consists of three items. Items from the original instrument that did not load on the factor structure were items 7, 12, 14 and 15. No substantive reason could be found for their exclusion.

The results of the EFA were used to conduct the CFA. The second-order model was identified as the best-fitting model. This second-order factor model consists of *Transformational leadership* as a super factor and equal contributions of the

two factors (*leadership focused on organisational, group and individual transformation and leadership focused on creativity and innovation*) ($\chi^2/df(80) = 5.30$, CFI = 0.99, RMSEA = 0.034).

A rigorous investigation into the validity of the construct (and the two factors) was carried out, which included convergent validity. Convergent validity was assessed based on the hypothesised relationship it has with other, cognate constructs. The relational leadership constructs chosen were *Authentic leadership and LMX*. The organisational behaviour related constructs included are *Organisational energy; Perceived organisational support; Person-organisational fit; Psychological capital; Psychological contract; Pro-active work behaviour, and lastly Turnover intention*. The relatively high correlations between F¹: *Leadership focused on organisational, group and individual transformation* and F²: *Leadership focused on creativity and innovation* as well as the total transformational leadership score and the related measures is an indication of acceptable convergent validity.

Lastly, an assessment of discriminant validity was conducted through the use of multiple regression. The newly configured TLQ factors, F¹: *Leadership focused on organisational, group and individual transformation* and F²: *Leadership focused on creativity and innovation* were used as an independent or predictor variables, with the work attitudinal and positive organisational behaviour constructs as dependent variables. The purpose of this procedure was to determine whether there is a difference between the two factors (discriminant validity). The results of the multiple regression support the notion of discriminant validity, as the two factors reported unique contributions in the regression model (different beta values).

Conclusion

The value of our study rests on the adapted (reconfigured) TLQ instrument, validated for the use in the South African context. The adapted TLQ was found to be valid on structural (factorial) as well as external (discriminant or convergent) levels, and it was found to be reliable. The

results suggest that this valid, adjusted measurement of transformational leadership could be used with confidence within the South African context. It further also emphasises the need to scrutinise instruments that were developed in other parts of the World before it is used in a different context. This is even more applicable on the diverse South African population.

Limitations and recommendations

The limitation of our study is mainly methodology related. The self-reporting nature of the TLQ could lead to bias, although a thorough briefing (about anonymity and confidentiality) of the participants was conducted. The etic approach poses a further limitation, as the TLQ was used in its original form without any vocabulary adjustments.

The use of a cross-sectional design is a further possible limitation, as it might have an impact on the actual relationship between constructs. It provides little information and knowledge about the causality, specifically how the relationships unfold over time and on the direction of causality.

A longitudinal study is recommended to investigate the relationship between the components (and related measures) over a period of time. A further recommendation is to use our study (the adapted TLQ) and also the indication of the relationships between constructs (as presented in the multiple regression analysis) in comprehensive studies in the future. This may even include the effect of membership of specific demographic groups (e.g. generational differences) and the determination of the antecedents and consequences of transformational leadership on work attitudes and organisational behaviour.

Lastly, it is recommended that the construct of transformational leadership be studied from an etic-emic approach, with the use of these results (as the etic side) and the development of new, context-specific items (from an African perspective) and to include it in further studies.

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Competing interests

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

Authors' contributions

S.G. and A.G. contributed equally to this work.

Ethical considerations

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Data availability

The data that support the findings of this study are available from the corresponding author, S.G., upon reasonable request.

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