SA Journal of Industrial Psychology
ISSN: (Online) 2071-0763, (Print) 0258-5200

Dimensionality of an adapted Authentic Leadership Questionnaire: Three independent South African studies

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Dates:
Received: 10 May 2024
Accepted: 10 Oct. 2024
Published: 20 Nov. 2024

How to cite this article:
Grobler, A., & Grobler, S. (2024). Dimensionality of an adapted Authentic Leadership Questionnaire: Three independent South African studies. *SA Journal of Industrial Psychology/SA Tydskrif vir Bedryfsielkunde, 50*(0), a2216. https://doi.org/10.4102/sajip.v50i0.2216

Orientation: Authentic leadership (AL) is a well-defined construct and measured by instruments mostly developed and validated in the United States and Europe.

Research purpose: To validate an adapted version of the Authentic Leadership Questionnaire (ALQ) within the South African context.

Motivation for the study: Instruments are often used without the necessary research on validity, thus disregarding the context in which it is utilised. It is emphasised by many scholars that inferences derived from the scores obtained from instruments need to be validated and instruments be adapted accordingly for a specific context, in this case, South Africa.

Research approach/design and method: This article is based on the results of three separate studies conducted over 3 years. The research was approached from a quantitative positivist paradigm, utilising a cross-sectional design and survey method. The sample consisted of 5515 participants, with 60 respondents from 93 organisations across both the private and public sectors. The analysis includes item screening, exploratory factor analysis, confirmatory factor analysis, determination of convergent validity and invariance analysis across the two sectors.

Main findings: The results yielded a one-factor solution (compared to the original four-factor model), with all 16 items loading on the unidimensional factor. This one-factor model was reliable, valid and invariant regarding the private and public sectors used in this study.

Practical/managerial implications: The practical value is an AL questionnaire adapted and validated for the South African context.

Contribution/value-add: The validated ALQ can be used with confidence by organisations regardless of sector, researchers and academics.

Keywords: authentic leadership; leadership; adaption; validation; South Africa.

Introduction

The focus of this study is authentic leadership (AL) and the dimensionality of the construct, as measured by the Authentic Leadership Questionnaire (ALQ). Why AL? Because of the relational focus of AL, it is associated with the general leadership philosophy in the South African (and African) context, called Ubuntu (Powell, 2023). Ubuntu is the way leaders manage and lead people, focussing on the humanistic elements of leadership, including respect, dignity, integrity and communality (Bolden & Kirk, 2011; Grobler & Singh, 2018; Zondo, 2022). According to Avolio and Gardner (2005), AL is based on humanism (like Ubuntu), which is the root element of all positive forms of leadership. Khoza (2012) promotes the humanistic philosophy of Ubuntu for leaders who are reflective, resonant, value-based and vision-led in the African context. West (2014) links Ubuntu with AL through Aristotle's virtue ethics (the quest to understand and live a life of moral character) as an important element of the underlying philosophy of both leadership paradigms.

The dimensionality of AL was investigated through a short overview of the literature and an empirical investigation through the validation of the ALQ within the South African context. It is deemed necessary because the instrument was developed and validated in the United States (US) by Walumbwa et al. (2008), is administered in English and has been adapted in terms of the unit of analysis. The original instrument focussed on the perception of leaders' AL characteristics, as measured by the 16 ALQ items. The revised version, and change of the unit of analysis,

is based on the respondents' perception of their leaders' AL characteristics. This study is thus based on an etic approach, where an existing instrument with a slight adaptation is validated within a different cultural context.

South Africa is a country with a diverse population, including the presence of 11 official languages, with most citizens having a first language other than English. Language is an extremely important aspect when instruments are developed and administered, and should be validated within the context, in this case, South Africa. It is necessary to establish its cross-cultural and construct validity. It has been reported that instruments developed for a different population (e.g. Europe and the US) often have a different factor composition when validated within the South Africa context (Grobler, 2016, 2017; Grobler & Flotman, 2020; Grobler et al., 2019; Grobler & Grobler, 2023; Grobler & Joubert, 2018; Grobler & Mathafena, 2021; Grobler & Singh, 2018; Grobler & Steyn, 2014). The factor structures in all these South African-based studies include a smaller number of factors (and often a unidimensional factor solution), compared to the original instrument. The reason for the uncomplicated factor structure in these studies has been attributed to a possible inability to differentiate between related items because of intricate sentence structures, technical terms or specific domain knowledge. The use of imported instruments, in their original form, might be problematic; it is thus extremely important to validate an imported instrument before scientific interpretations are made.

This study aimed to provide a valid and context-relevant AL instrument that could be used for leadership studies and diagnosis within organisations in South Africa. Leadership and leadership studies are extremely important, as it is regarded as a social process according to Vilakati and Schurink (2021). It is seen as a valued commodity that accelerates the achievement of individual and collective goals (Yukl & Gardner, 2020). Northouse (2021) postulates that authenticity is promoted by good leadership, and it fosters authentic relationships. Leaders must demonstrate their consistent authenticity by taking actions that allow followers to participate in decision-making that influence their performance (Aramovich & Blankenship, 2020). This is even more relevant in the South African context, as Bolden and Kirk (2011) and Zondo (2022) believe that Africans aspire for participative leadership, founded on humanistic principles, which value individual differences, authenticity and serving the community.

Defining authentic leadership

The concept of authenticity has its roots in Greek philosophy ('To thine own self be true') (Avolio & Gardner, 2005; Harter, 2002). Bishop (2013) reported that being authentic is a continuous process and that it is associated with individual values and importantly relationships. Because of the relational characteristic of authenticity, it can be associated with the social phenomena of leadership. The connection between authenticity and leadership has been made by Seeman (1966) within the fields of sociology and education (Chan et al., 2005). From an organisational perspective, AL is defined by Luthans and Avolio (2003):

> [*A*]s a process that draws from both positive psychological capacities and a highly developed organisational context, which results in both greater self-awareness and self-regulated positive behaviours on the part of leaders and associates, fostering positive self-development. (p. 243)

This definition is further expanded by Avolio and Gardner (2005) to include an awareness of their own and others' values and morals, a clear contextual awareness resulting in the leader being hopeful, optimistic, confident and ethical (high moral character). Consistency between leaders' words and deeds is significant to followers (Avolio & Gardner, 2005).

Walumbwa et al. (2008) comprehensively define AL as:

> [*A*] pattern of leader behaviour that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalised moral perspective, balanced processing of information and relational transparency on the part of leaders working with followers, fostering positive self-development. (p. 94)

Grobler and Powell (2018) provide an operational definition of AL, namely:

> … knowing oneself; consistency between values and actions; presenting the authentic self to others through truthful relationships; and objectively analysing data and different points of view without bias before coming to a decision. (p. 3)

Dimensionality of authentic leadership

The definitions provided by authors suggest that AL is a multidimensional construct, and this position is consistent with previous studies. Shamir and Eilam (2005), for instance, describe authentic leaders as possessing a degree of person-role merger, self-concept clarity centred around values and convictions, goals aligned with who they are and behaviours consistent with their self-concept. Begley (2001, 2006) viewed AL as having only three components: self-knowledge, capacity for moral reasoning and sensitivity to the orientation of others. Woods (2007) argued that AL comprises three dimensions, namely personal authenticity (being aware and true to the self-values and potential for development), ideal authenticity (eudaemonic conception of well-being) and social authenticity (faithfulness to authenticity formed through social interaction). Whitehead (2009) operationalised the definition of AL through the inclusion of three dimensions, namely self-awareness, awareness of followers and development of others; building a high level of trust within a solid ethical framework and commitment to organisational success within the construct of social values. Northouse (2021), on the other hand, acknowledged only two components for AL, namely moral reasoning and life events

(incidents that form leader's lives and affect their authentic development).

Walumbwa et al. (2008, p. 94) propose a four-dimensional conceptualising of AL, with the dimensions being self-awareness, internalised moral perspective, balanced processing of information and relational transparency.

Authentic leadership related to other leadership theories

The theory of AL tends to overlap conceptually with other forms of leadership including ethical, transformational, servant and spiritual leadership (Avolio & Walumbwa, 2014). Authentic leadership might overlap other forms of leadership (Einola & Alvesson, 2021), yet has distinct features that justify it as a stand-alone construct (Lemoine et al., 2019).

Powell (2023) has empirically found a direct link between Ubuntu leadership and AL, through a qualitative and quantitative study, employing the Interactive Qualitative Analysis (IQA) methodology and instrument development and validation, respectively. She confirmed that:

> [*L*]eaders who value the strength of diversity, are authentic with clear values, are willing to listen and adapt to new ideas, who have a clear vision and who are empathetic and good communicators will drive organisational Ubuntu leadership. (p. 149)

Relationship between authentic leadership and outcomes

Authentic leadership as a construct, within the positive psychology domain, has a constructive effect on organisational behaviour. Positive relationships were reported between AL and organisational citizenship behaviour (Milon & Shapira-Lishchinsky, 2021; Quraishi & Aziz, 2018), psychological ownership, self-confidence and organisational job embeddedness (Erkutlu & Chafra, 2013, 2016), psychological empowerment (Zhang et al., 2021), psychological capital (Adil & Kamal, 2020; Aria et al., 2019; Feng, 2016; Grobler & Powell, 2018), organisational culture (Shulhan, 2019), intrinsic motivation and mood (Ahmad et al., 2015), meaningfulness in work and altruistic behaviour (Sagnak & Kuruoz, 2017), openness to change and trust in the manager (Kiliç & Yavuz, 2021), occupational self-efficacy and teacher engagement (Alazmi & Al-Mahdy, 2022), organisational identification (Grobler & Powell, 2018), creativity (Ahmad et al., 2015; Shang et al., 2019), work engagement, job related affective well-being and quantitative overload (Adil & Kamal, 2020), performance (Abbas et al., 2023; Bahzar, 2019; Munir et al., 2019) and commitment (Abbas et al., 2023; Kasa et al., 2020), optimism and extra role behaviour (Srivastava & Dhar, 2019).

The purpose of this study was to assess the validity of the ALQ, primarily because it has been adapted and secondarily, because of its complex factor structure.

Methodology

This study (which comprises three independent studies over 3 years) was conducted utilising a cross-sectional design from a quantitative positivist paradigm. Sixty participants from each of the 93 participating organisations (across all three studies) were conveniently sampled. The pooled sample consisted of employees from 33, 30 and 30 organisations of each of the three independent studies, respectively. The private sector is represented by organisations from the medical, engineering, retail, construction, financial, telecommunication, pharmaceutical and information technology industries. The public sector organisations consist of National and Provincial Departments, Local Government as well as State Owned Enterprises.

The final sample consists of 5515 valid respondents (employees who rated their leaders) with 3263 from the private sector (across 55 organisations) and 2252 (and 38 organisations) from the public sector. The racial and gender distribution of the sample is regarded to be representative of the National workforce of South Africa in general.

The mean age of the respondents was 37.70 years (standard deviation [SD] = 9.22), and the mean tenure in the specific organisation was 8.36 years (SD = 7.63). It could therefore be assumed that the respondents are relatively mature and that they have the necessary exposure to the organisation and leadership to be able to respond adequately to the items.

Measuring instrument

An adapted version of the ALQ consisting of 16 items, comprising of four factors, namely Self-awareness, Internalised Moral Perspective, Balanced Processing and Relational Transparency, was administered. The adaptation focussed on the unit of analysis, modifying the original instrument that was intended for the assessment of the leader himself/herself in terms of the self-perceived level of AL. The adaptation took place with the inclusion of 'The leaders in my organisation …' to assess the participant's perception of the leaders in the organisation's AL attributes. The original questionnaire was developed by Walumbwa et al. (2008).

The questionnaire was administered in English only. A five-point Likert-type scale was used in the questionnaire, with 1 = 'strongly disagree' and 5 = 'strongly agree'. The items are:

(AL1) *The leaders in my organisation acknowledge their limitations and are able to function within it*.

(AL2) *The actions of the leaders in my organisation reflect their core values*.

(AL3) *The leaders in my organisation seek others' opinions before making up their minds*.

(AL4) *The leaders in my organisation openly share their feelings with others*.

(AL5) *The leaders in my organisation know their strengths and they are using it*.

(AL6) *The leaders in my organisation do not allow group pressure to control them*.

(AL7) *The leaders in my organisation listen closely to the ideas of those who disagree with them*.

(AL8) *The leaders in my organisation let others know who they truly are as a person*.

(AL9) *The leaders in my organisation seek feedback as a way of understanding who they really are as a person*.

(AL10) *Other people know where the leaders in my organisation stand on controversial issues*.

(AL11) *The leaders in my organisation do not emphasise their own point of view at the expense of others*.

(AL12) *The leaders in my organisation rarely present a 'false' front to others*.

(AL13) *The leaders in my organisation accept the feelings they have about themselves*.

(AL14) *The leaders in my organisation are guided by their morals*.

(AL15) *The leaders in my organisation listen very carefully to the ideas of others before making decisions*.

(AL16) *The leaders in my organisation admit their mistakes to others*.

Items 1, 5, 9 and 13 measured Self-awareness; 2, 6, 10 and 14 measured Internalised Moral Perspective; 3, 7, 11 and 15 measured Balanced Processing and 4, 8, 12 and 16 measured Relational Transparency.

Statistical analysis

The statistical analysis was performed by using the Statistical Package for the Social Sciences (SPSS version 29). Cronbach alpha coefficients, interim correlations as well as explorative and confirmatory factor analysis (CFA) were carried out to determine the reliability and validity of the instrument. The suitability of the data was tested before performing factor analysis. Firstly, this involved the sample size; secondly, the strength of the relationship between the variables and thirdly, the linearity of the relationship between the variables.

Bartlett's test of sphericity (Hair et al., 2019a) was performed to determine the inter-correlations between items, specifically to determine whether the correlation matrix is significantly different from an identity matrix. The Kaiser–Meyer–Olkin (KMO) measure was further used to quantify whether the items correlated sufficiently and to determine whether a factor analysis could be performed. For exploratory factor analysis (EFA) to be considered an appropriate technique (Hair et al., 2019b), the statistic needs to be significant ($p < 0.05$). The minimum level set is 0.60 (Hair et al., 2019b), on a scale of 0–1 (Pallant, 2020).

To aid in the interpretation of the initial results, an oblique rotation – specifically Promax rotation – was performed. The decision regarding the number of variables (factors) to be retained was based on the Guttman–Kaiser eigenvalue greater-than-one rule (K1 rule), together with the scree plot (with specific reference to the shape of the curve) and lastly the Monte Carlo principal component analysis (PCA) for parallel analysis. Hair et al. (2019b) indicated that a guide for variance accounted for by the factors needs to meet the lower limit of 50%.

The Cronbach alpha coefficients were calculated to assess the internal consistency of the instrument (as proposed by the EFA), with 0.70 regarded as the lower limit and 0.95 as the higher limit. Collinearity was assessed using the variance inflation factor (VIF), with three being the critical value of collinearity issues (Hair et al., 2018).

A CFA was conducted to validate the construct definition of AL by establishing a higher-order, multidimensional model. The CFA examined the presence of a unidimensional AL factor (as identified by the EFA), using the Analysis of Moment Structures (AMOS) maximum likelihood procedure (Byrne, 2016). To assess the model fit, several fit indexes were used including comparative fit index (CFI), 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 (df)(χ^2/df). According to Byrne (2016), there is no one acceptable cut-off value of what constitutes adequate fit. It was, however, decided to use a CFA value of 0.90, an RMSEA value of 0.05 or less and a standardised root mean square residual (SRMR) value close to 0.08 or below as indicators of adequate fit. Although sensitive to sample size, the χ^2/df less than 5.00 was interpreted as a good fit (Byrne, 2016).

The first model was based on the original secondary factor (AL) with four factors *Self-awareness*, *Internalised Moral Perspective*, *Balanced Processing* and *Relational Transparency*. A first-order factor model was also included in the analysis in which items were allowed to load onto their respective factors. Finally, a model was further assessed where items were loaded directly onto the latent AL factor, thus a unidimensional model.

Composite reliability (CR) and the average variance extracted (AVE) were used to inspect the instrument's convergent validity. Discriminant validity was further determined by comparing the AVE with the maximum shared variance (MSV) and the average shared variance (ASV), respectively (Hair et al., 2019b).

Convergent validity was further determined through the assessment of the correlation between the ALQ (and its components and/or factors) and several other related measures. It was hypothesised that AL is related to other relational leadership styles. The leadership constructs used to determine the convergent validity of the ALQ are ethical leadership (De Hoogh & Den Hartog, 2008), leader-member-exchange (LMX) (Graen & Uhl-Bien, 1995; Liden & Maslyn, 1998), servant leadership (Liden et al., 2015) and transformational leadership (Podsakoff et al., 1990).

It is further hypothesised that AL would have a positive impact on organisational behaviour, including employee engagement (Schaufeli et al., 2006), innovative behaviour (Kleysen & Street, 2001), job security (Hochwarter et al., 2007), organisational identification (Mael & Ashforth, 1992), organisational productive energy (Cole et al., 2012), passion for work (Vallerand & Houlfort, 2003), perceived organisational support (Eisenberger et al., 1986), person-organisational fit (Cable & DeRue, 2002; Grobler, 2016), pro-active work behaviour (Parker & Collins, 2010), psychological capital (Grobler & Joubert, 2018; Luthans et al., 2007), psychological contract (Freese & Schalk, 1997), psychological empowerment (Spreitzer, 1995), turnover intention (Brashear et al., 2003) and work-self efficacy (Pepe et al., 2010).

This study is based on three separate studies, independent of each other, in three consecutive years, referred to in the analysis as *Study*[1–3]. These studies formed part of a larger leadership and organisational behaviour research focus area. Ethical clearance for all three studies was granted by the academic institution's research ethics committee.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of South Africa School of Business Leadership Research Ethics Committee (reference no.: study 3 (2021_SBL_AC_004_CA); study 2 (2020_SBL_AC_009_CA); study 1 (2019_SBL_004_CA).

Results

Determination of construct validity of the Authentic Leadership Questionnaire

The data screening confirmed that all variables are interval like, and the variable pairs appeared to be bivariate and normally distributed. It was also found that all the cases were independent of one another.

In the first step, during the evaluation of the sample size, it was found that the variable-to-case ratio is ±1:111 (121:1, 106:1 and 106:1, respectively), which is regarded to be adequate according to Meyers et al. (2016). As part of the process to determine factorial validity, the KMO measure of sampling adequacy and Bartlett's test of sphericity were performed on the data of all three studies to determine the suitability of performing a factor analysis. An EFA (Promax rotation) of the 16 items of the ALQ was subsequently performed on the data from each of the three studies independently and for the combined data. The results are reported in Table 1.

The results in Table 1 support the strategy to perform an EFA as all the KMO values exceed the critical value of 0.6 (Hair et al., 2019b), and the correlation between the variables is sufficient (Chi-square values statistically significant < 0.05).

The Guttman–Kaiser eigenvalue greater-than-one rule (K1 rule) was further used in conjunction with the scree plot to determine the number of factors. The results are reported in Table 2.

In two of the studies (Study[1 and 3]) as well as the combined data, only one factor reported an eigenvalue larger than one and two factors in Study[2]. Meyers et al. (2016) regard 50% of variance explained to be the minimum for a factor solution. In support of the K1 rule, Cattell's scree test was performed to determine the number of components to be retained, the results are reported in Figure 1.

It is evident in all four figures that the elbow flattens off after the first component (factor). Both the scree plot as well

TABLE 1: Kaiser–Meyer–Olkin measure of sampling adequacy and Bartlett's test of sphericity.

Statistic	Study[1]	Study[2]	Study[3]	Combined
Kaiser–Meyer–Olkin measure of sampling adequacy	0.95	0.95	0.97	0.97
Bartlett's test of sphericity				
Approx. Chi-square	13 650	12 111	15 871	43 364
Degrees of freedom (*df*)	120	120	120	120
Sig.	< 0.001	< 0.001	< 0.001	< 0.001

Sig., significance; Approx., approximate.

TABLE 2: Eigenvalues larger than one and explanation of variance.

#	Initial Eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total
Study[1]							
1	7.27	45.42	45.42	7.27	45.42	45.42	4.65
Study[2]							
1	7.30	45.62	45.62	7.30	45.62	45.62	4.35
2	1.15	7.20	52.81	1.15	7.20	52.81	3.68
Study[3]							
1	8.58	53.62	53.62	8.58	53.62	53.62	4.52
Combined							
1	8.02	50.12	50.12	8.02	50.12	50.12	4.52

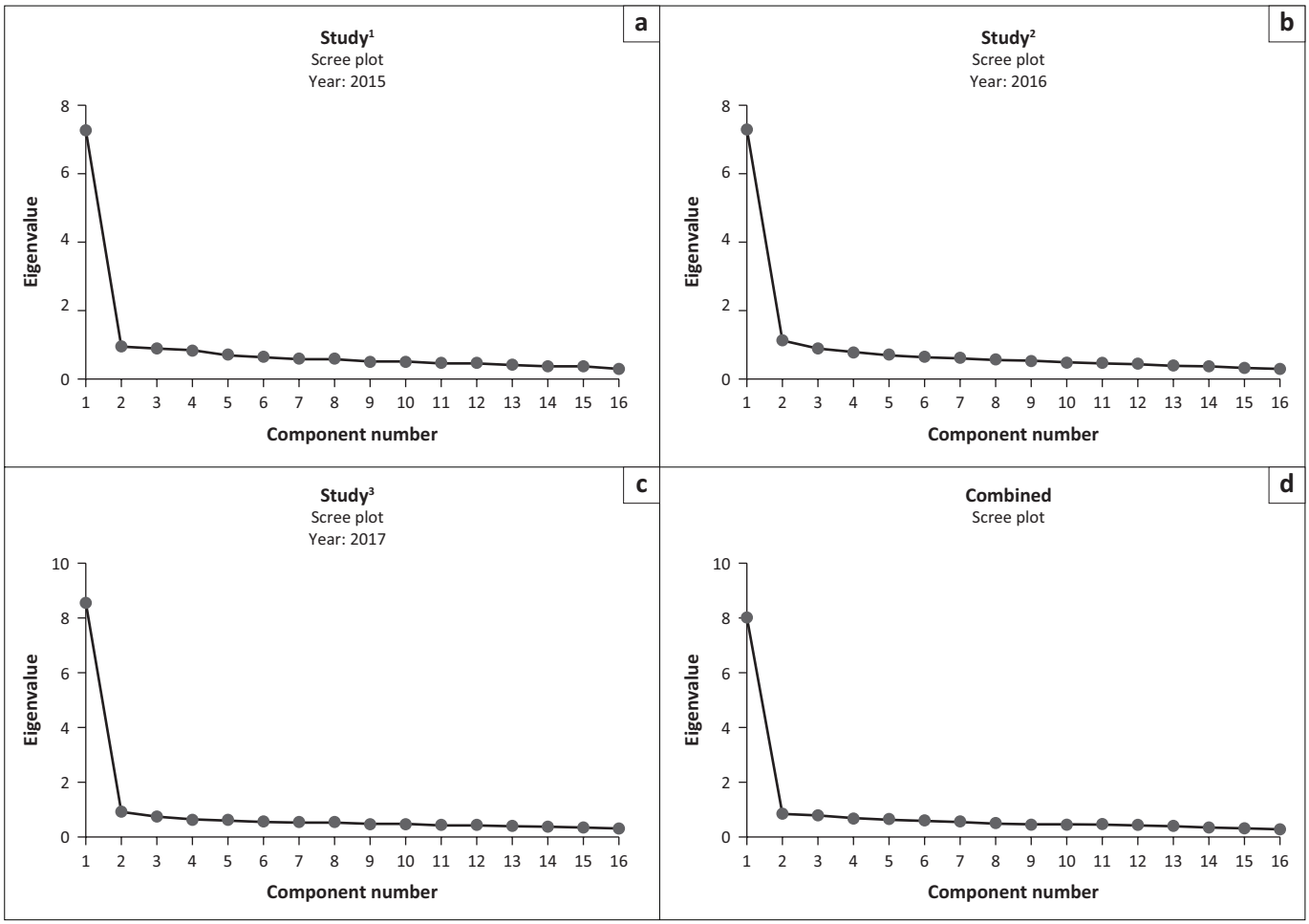

FIGURE 1: Cattell's scree plots.

TABLE 3: Results of the Monte Carlo parallel analysis.

Component number	Actual eigenvalues from PCA				Criterion value from parallel analysis*		Decision			
	S[1]	S[2]	S[3]	C	S[1–3]	C	S[1]	S[2]	S[3]	C
1	7.27	7.30	8.58	8.02	1.18	1.14	Accept	Accept	Accept	Accept
2	0.96	1.15	0.89	0.86	1.16	1.11	Reject	Reject	Reject	Reject

PCA, principal component analysis; S, Study; C, combined.

*, The criterion value from parallel analysis yielded the same results for all the studies.

as the K1 rule are often regarded as being too conventional to determine the exact number of factors (Pallant, 2020). It was decided to use the Monte Carlo parallel analysis simulation technique to validate these findings. Two components were included in the Monte Carlo parallel analysis. The results are reported in Table 3.

Monte Carlo parallel analysis yielded a one-component (factor) model, after comparing the eigenvalues obtained from the actual data with the eigenvalues obtained from the random data. The item statistics and communalities based on EFA (Promax rotation) are reported in Table 4.

A factor loading cut-off point of 0.40 for inclusion in the interpretation of a factor was used. All 16 items loaded on one factor. The communalities across the three studies are high (all above 0.30). Correlations between the items were determined and ranged from 0.38 to 0.66. The VIF values reported are all acceptable (< 3.0) (ranging from 0.40 to 0.61). This is an indication that there are no collinearity issues.

The descriptive statistics and the psychometric properties of the ALQ, as a unidimensional factor solution, are reported in Table 5.

The descriptive statistics in Table 5 show that AL (as a one-factor solution) reported relatively high mean scores on a 5-point Likert scale. The mean scores ranged from 3.18 to 3.68 (Study[1 and 3]) and 3.34 for the combined sample. The skewness and kurtosis values for both factors do not exceed the critical values of 2.00 and 7.00, respectively (West et al., 1995), which is an indication that the data are normally distributed. All the studies as well as for the combined sample reported negative values on the skewness scale, which is an indication that the distribution has relatively

TABLE 4: The descriptive statistics and the communalities of the items, based on a single-factor structure.

Q #	Study[1]			Study[2]			Study[3]			Combined		
	Mean	SD	*h*	Mean	SD	*h*	Mean	SD	*h*	Mean	SD	*h*
AL[1]	3.36	1.02	0.51	3.42	1.00	0.48	3.55	1.05	0.45	3.44	1.03	0.46
AL[2]	3.48	1.01	0.49	3.55	0.94	0.52	3.91	1.00	0.52	3.64	1.00	0.51
AL[3]	3.15	1.13	0.44	3.17	1.12	0.60	3.71	1.06	0.58	3.33	1.13	0.52
AL[4]	2.99	1.08	0.48	3.02	1.07	0.61	3.41	1.11	0.56	3.13	1.10	0.52
AL[5]	3.54	0.98	0.46	3.52	0.94	0.46	3.50	1.05	0.51	3.52	0.99	0.42
AL[6]	3.25	1.07	0.35	3.33	1.02	0.50	3.57	1.16	0.56	3.37	1.09	0.41
AL[7]	3.01	1.08	0.56	3.03	1.07	0.64	3.62	1.02	0.36	3.21	1.09	0.52
AL[8]	3.10	1.07	0.48	3.12	1.00	0.49	3.72	1.10	0.61	3.30	1.10	0.56
AL[9]	2.98	1.09	0.48	2.93	1.09	0.62	3.68	1.05	0.62	3.19	1.13	0.57
AL[10]	3.18	0.99	0.33	3.13	0.99	0.37	3.75	1.13	0.53	3.34	1.08	0.44
AL[11]	3.15	1.03	0.38	3.08	1.02	0.46	3.64	1.03	0.36	3.28	1.05	0.43
AL[12]	3.09	1.08	0.33	3.13	0.96	0.42	3.81	1.03	0.61	3.33	1.08	0.47
AL[13]	3.30	0.87	0.36	3.30	0.84	0.53	3.74	1.03	0.53	3.44	0.94	0.43
AL[14]	3.37	1.02	0.45	3.40	0.98	0.61	3.83	1.02	0.61	3.53	1.03	0.53
AL[15]	3.13	1.12	0.60	3.09	1.07	0.65	3.77	1.01	0.57	3.32	1.11	0.62
AL[16]	2.87	1.13	0.56	2.86	1.03	0.52	3.61	1.13	0.60	3.10	1.15	0.60

AL, authentic leadership; SD, standard deviation; Q, Question; *h*, commonality.

TABLE 5: Descriptive statistics and psychometric properties of the unidimensional Authentic Leadership Questionnaire.

Statistic	Study[1]	Study[2]	Study[3]	Combined
Mean	3.18	3.19	3.68	3.34
Standard deviation	0.70	0.69	0.77	0.78
Skewness	-0.25	-0.22	-0.73	-0.26
Kurtosis	0.08	0.15	0.44	-0.09
Cronbach alpha (α)	0.92	0.92	0.94	0.93
Composite reliability (CR)	-	-	-	0.97
Average variance extracted (AVE)	-	-	-	0.49
Maximum shared variance (MSV)	-	-	-	0.44
Average shared variance (ASV)	-	-	-	0.22

few small values and tails off to the left. The Cronbach's alpha coefficient of the ALQ as a unidimensional instrument is acceptable ($0.70 \leq \alpha \leq 0.95$) (Hair et al., 2018). It would thus appear that it possesses an acceptable level of internal consistency.

The convergent validity of the items was confirmed by the CR and the AVE, with critical values of >0.70 and <0.50, respectively. The discriminant validity of each of the 16 items was further determined by comparing the AVE with the MSV. Satisfactory discriminant validly was reported with MSV less than AVE, and the ASV is less than the AVE (Hair et al., 2019a).

To investigate the Walumbwa et al. (2008) factor structure, it was decided to test three structural permutations of the ALQ using a CFA. The results of the three models tested are reported in Table 6.

The CFA yielded a one-factor model, with the best-fit statistics in all three studies as well as the combined sample. The fit indexes reported for the combined sample are χ^2/df (1147) = 13.34, CFI = 0.98 and RMSEA = 0.048. The Chi-square values are, however, high and significant, not meeting the criteria of (χ^2/df less than 5.00) but are regarded to be sensitive to sample size, with large samples usually rejected (Table 7).

The worst-fitting model is the four original factors (Self-awareness, Internalised Moral Perspective, Balanced Processing and Relational Transparency) with the secondary factor, namely AL (model[a]), as demonstrated by the relatively poor fit indices.

The Chi-square test was used to assess whether the proposed one-factor model (model[c]) is significantly better than the original factor composition (model[a]) and was carried out using a Chi-square test. The Chi-square difference is 1140 (2287–1147), which is distributed as Chi-square with (98–86 = 12) degrees of freedom (significant difference on a 5% significance level).

The results illustrate that the best-fitting model is the one-factor model with 16 items (model[c]) which is a confirmation of the EFA results.

To assess the possibility of invariance between the private and public sectors, an elementary cross-validation analysis was conducted. The sample was split into the two sectors, using 2000 cases randomly selected from each sector. The results reported for the two sample groups were χ^2/df (86) = 7.55, CFI = 0.97, TLI = 0.96, RMSEA = 0.057, Expected cross-validation index (ECVI) = 0.38 and χ^2/df (86) = 4.55, CFI = 0.98, TLI = 0.97, RMSEA = 0.042, ECVI = 0.25 for the public and private sector, respectively. The Likelihood Ratio Test, which is regarded to be a determination of the degree of invariance, is 3.00 (7.55 – 4.55), and the difference between the TLI values is 0.01 (0.98 – 0.97), which is lower than the norm of 0.05. The ECVI values for the public and private sectors are 0.38 and 0.25, respectively (difference = 0.13), which is marginal. The cross-validation of the two sample groups. The comparison of the two sample groups using cross-validation supports the notion of invariance.

Convergent validity

The convergent validity of the ALQ was investigated by comparing it to a range of other leadership instruments using

TABLE 6: Comparison of a priori Authentic Leadership Questionnaire factor structure.

Structure	χ^2	*df*	χ^2/df	CFI	TLI	SRMR	RMSEA
Study[1]							
†Model[a]	1068	98	10.90	0.93	0.91	0.04	0.071
†Model[b]	938	92	10.20	0.94	0.92	0.04	0.068
Model[c]	366	86	4.26	0.98	0.97	0.03	0.041
Study[2]							
†Model[a]	1219	98	12.44	0.91	0.89	0.05	0.083
†Model[b]	1181	92	12.84	0.91	0.88	0.05	0.084
Model[c]	740	86	8.61	0.95	0.92	0.04	0.067
Study[3]							
†Model[a]	831	98	8.49	0.95	0.94	0.03	0.066
†Model[b]	700	92	7.61	0.96	0.95	0.03	0.062
Model[c]	773	86	8.99	0.96	0.94	0.03	0.068
Combined							
†Model[a]	2287	98	23.34	0.95	0.94	0.04	0.064
†Model[b]	2092	92	22.75	0.95	0.94	0.04	0.063
Model[c]	1147	86	13.34	0.98	0.97	0.03	0.048

Notes: All Chi-square values are significant at $p < 0.05$; Model[a], Second-order structure (four factors with secondary factor); Model[b], First-order structure (four-factor structure); Model[c], One-factor model (all 16 items).

CFI, comparative fit index; TLI, Tucker–Lewis index; SRMR, standardised root mean square residual; RMSEA, root mean square error of approximation; *df*, degrees of freedom.

†, Based on the original factor structure of Walumbwa et al. (2008).

TABLE 7: Cross-validation (random sampling of 2000 per sector) based on a priori Authentic Leadership Questionnaire factor structure.

Structure	χ^2	*df*	χ^2/df	CFI	TLI	ECVI	RMSEA
One-factor model (all 16 items)							
Public sector	649.65	86	7.55	0.97	0.96	0.38	0.057
Private sector	391.25	86	4.55	0.98	0.97	0.25	0.042

Note: All chi-square values are significant at $p < 0.05$.

CFI, comparative fit index; TLI, Tucker–Lewis index; RMSEA, root mean square error of approximation; ECVI, Expected cross-validation index; *df*, degrees of freedom.

Pearson correlation coefficients. The results are reported in Table 8.

The results in Table 8 support the notion of convergent validity, with specific reference to the high correlations (all $p \leq 0.001$) between AL and the related leadership constructs. A correlation of 0.40 is an indication of convergence with 0.50 and higher a clear sign of convergence (Cohen et al., 2022). The correlation coefficients range from 0.47 (between AL and LMX) and 0.75 (between AL and servant leadership).

Authentic leadership reported significant (medium to high) correlations with a range of organisational behaviour constructs, with the highest being with person-organisational fit ($r = 0.52$; $r = 0.48$ and $r = 0.47$). Significant, negative correlations were reported between AL and turnover intention ($r = –0.40$; $r = –0.32$ and $r = –0.25$).

TABLE 8: Convergent validity of the Authentic Leadership Questionnaire as a unidimensional measure through hetero-trait-mono method comparison with other related measures (alphabetically).

Constructs	Study[1]	Study[2]	Study[3]
Leadership constructs			
Ethical leadership	-	0.64	-
Leader-member exchange (LMX)	0.61	0.47	0.71
Servant leadership	-	-	0.75
Transformational leadership	0.69	0.65	-
Organisational behaviour constructs			
Employee engagement	0.36	-	-
Innovative behaviour	0.23	-	-
Job security	0.39	-	-
Organisational identification	-	-	0.34
Organisational productive energy	-	0.42	-
Passion for work	-	0.41	-
Perceived organisational support	0.32	-	-
Person-organisational fit	0.52	0.48	0.47
Pro-active work behaviour	-	0.29	-
Psychological capital	-	0.28	-
Psychological contract	0.42	-	-
Psychological empowerment	-	-	0.38
Turnover intention	-0.40	-0.32	-0.25
Work-self efficacy	0.23	-	-

Note: All correlations are significant at $p \leq 0.001$ level.

Limitations and recommendations

Methodological limitations associated with this type of research need to be reported. This includes self-reporting with the possibility of method bias, the use of a cross-sectional design and the non-adaptation of the language used in the instrument (the basic wording of the items was kept as is) to the South African (multi-lingual) context. The etic approach, thus using an existing, imported instrument, is a further limitation, as it might lead to important AL elements, that are context specific being left out. It is therefore recommended that AL as a construct be investigated through an emic approach to determine the accuracy and relevance of its internationally accepted operational definition. It is recommended that the assessment of observed behaviour or intentions of leaders be used, as it would provide much richer information than follower perceptions of leader behaviour.

A further recommendation is to include demographic variables in future studies, such as different generations, as they may affect AL and its relationship with other variables. Additionally, the results should be further analysed with the possible inclusion of the effects of membership in specific demographic groups (e.g. generational differences) and the determination of the antecedents and consequences of AL on work attitudes and organisational behaviour.

It is further recommended that this instrument be validated by assessing the actual behaviour or intentions of leaders, rather than relying on follower perceptions of AL behaviour. Lastly, the construct of AL could be studied from an etic-emic approach, utilising these results as the etic side while developing new, context-specific items from an African perspective for inclusion in further studies.

Conclusion

Authentic leadership as a construct has been used in various studies in South Africa, probably because of its relational focus, which is an essential element of leadership in the South African and African context. The leadership philosophy in South Africa is mainly based on Ubuntu and is conceptually and empirically found to be closely related to AL.

This study aimed to assess the validity of an adapted version of the ALQ, developed by Walumbwa et al. (2008). A large sample ($N = 5515$) across three independent studies was used for this study. The motivation for this study is the fact that the instrument was changed in terms of the unit of analysis, changed from a self-assessment by the individual as a leader, to the perception of employees of the leaders in their organisation. Added to this, a further rationale for the validation of the instrument was to assess its factor structure within the South African context that is diverse, also in terms of language. The validation of important instruments was highlighted by many scholars in the past, and studies in South Africa have revealed that instruments usually consist of different factor structures compared to the original instruments that were developed and validated in a different context. They believe that the use of the English language with the administering of the imported instruments might be a cause for less complex factor structures. They argue that the non-English (as a first language) speaking participants might overlook/misunderstand the finer nuances of the items, which then cluster them into this less complex and often unidimensional factor structure. The original instrument consisted of 16 items and four factors, namely Self-awareness, Internalised Moral Perspective, Balanced Processing and Relational Transparency.

An EFA was conducted and yielded a unidimensional factor structure. This one-factor solution (with all 16 of the original items) reported good psychometric properties in terms of reliability, convergent validity (after inspecting the CR and AVE values) and discriminant validity (considering the MSV, AVE and ASV values). Although all the items correlate with each other, no collinearity issues were identified. The CFA supported the unidimensional factor structure, with excellent fit statistics. No indication of invariance between the private and public sectors was found.

A further assessment of convergent validity was conducted through hetero-trait-mono method comparison and the utilisation of basic Pearson correlations between AL and related relational leadership constructs. High positive correlations were reported between AL and ethical leadership, servant leadership, LMX and transformational leadership. Positive correlations were also found between AL and a range of organisational behaviour constructs, with the highest correlation reported with person-organisational fit. Negative correlations were reported between AL and turnover intention. All correlations were statistically significant ($p < 0.001$).

This study thus supports various other studies conducted in South Africa in terms of the factor structures of imported instruments that are less complex, compared to the original conceptualisation, most probably because of language proficiency and/or the influence of culture. The use of imported instruments without any validation is strongly discouraged.

Acknowledgements

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

A.G. and S.G. equally contributed to the design and implementation of the research, the analysis of the results and the writing of the article.

Funding information

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Data availability

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

Disclaimer

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