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## Factor Structure and Reliability of A Servant Leader Humility Scale

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### Abstract

Humility is a core trait of servant leaders, enabling them to better understand the needs of their workplaces, make optimum decisions, readily accept and use feedback, and effortlessly ask for assistance when the need arises. While several instruments exist for measuring leader humility, their coverage of the humility domain differ. They also seem to conflate (and even confound) the construct with similar but distinct ideas like modesty and honesty. As a contribution towards addressing these issues, the researchers explored the factor structure and reliability of the humility scale from Page and Wong's (2000) Servant Leadership Profile (SLP). Principal component analysis (PCA) and confirmatory factor analysis (CFA) were performed using JASP on a dataset generated from a sample of 181 academic staff drawn online from the 30 public universities in Saudi Arabia. Contrary to Page and Wong's (2000) unidimensional structure of the humility scale, the PCA results suggest a two-factor (humbleness factor and self-effacement factor) solution that explains 49% of the cumulative variance. The results from CFA analysis confirm the fit of the model structure ( $\chi^2/df = 0.863$ , CFI = 1.000, TLI = 1.011, NFI = 0.954, RMSEA = 0.000, SRMR = 0.051, GFI = 0.974, MFI = 1.010) for the Servant Leader Humility Scale (SLHS). However, while results of reliability analyses indicate that the humbleness factor shows good psychometrics ( $\omega = .833$ , CI = .795–.872;  $\alpha = .810$ , CI = .759–.852), it is not so with the self-effacement factor ( $\omega = .685$ , CI = .614–.756;  $\alpha = .671$ , CI = .588–.741). Accordingly, we recommend that the humbleness factor should be given greater weight in the evaluation of servant leadership qualities.

**Keywords:** Servant Leader, Humility, Humbleness, Self-effacement, Factor Analysis

### Introduction

In popular literature, humility may seem to be an incongruous trait with the power and prestige associated with leadership (Morris et al., 2016). On the face of it, it is more likely to be seen as a weakness rather than a virtue that help a leader perform their onerous function. However, the terms often used to describe leadership in higher education (e.g., leading by example, helping others, connecting with people and tolerating ambiguity) suggest their roots in humility (Kelemen et al., 2022). Humility is so important as a personality trait that a group of psychologists added it to the famous Big Five personality theory, first

propounded by Fiske (1949), as the sixth personality construct and came up with the HEXACO (Honesty-humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness to experience) personality framework (Ashton *et al.*, 2004; Lee and Ashton, 2004). Saucier (2009) did similar work, adding an honesty-propriety factor to the big five. Ashton *et al.* (2004) describe the honesty-humility factor as one “emphasising trustworthiness, modesty, lack of greed, and lack of slyness. This factor is interpretable as Honesty-Humility, or perhaps as Morality, Sincerity, or Integrity” (p. 363). Since then, the term has been investigated in several contexts, but all were kneeling towards the construct's ethicality, morality, and religious orientations.

Even in the secular context of the corporate world, humility is often treated as something other-worldly and transcendental. For instance, Wang *et al.* (2017) remark that “humility involves submitting to something greater than oneself,” suggesting a higher moral calling beyond the worldly. The tendency to see humility from moral or religious lenses may not be unconnected with leaders' general disposition to focus first on the needs of the led and to make many sacrifices towards that meeting their followers' needs at times at significant personal cost (Sousa and Van Dierendonck, 2021; Wolfteich *et al.*, 2021). With some exceptions (e.g., Bharanitharan *et al.*, 2021; Qin *et al.*, 2021; Xu *et al.*, 2022), humility is viewed as a positive influence and a desirable character trait in leaders. Indeed, humility is an unalienable facet of a particular model of leadership, i.e., servant leadership (Krumrei-Mancuso, 2018).

Using what they call the three distinguishing features of servant leadership (motive, mode, and mindset), Eva *et al.* (2019) systematically reviewed 285 cognate studies spanning 20 years (1998–2018) and defined servant leadership as a follower centred leadership model (i.e., the motive) concerned with the satisfaction of followers' needs and interests on an individual basis (i.e., the mode) without attenuating the importance of other organisational interests (i.e., the mindset). The essence of the servant leadership model is best appreciated in contradistinction to other leadership models where the leader's ambitions and institutional agenda forms the driving motives for leading. Humbleness in leaders is possible where the person possesses the innate disposition defining servant leaders (Verdorfer, 2016). Thus, we see humility as the pivot of servant leadership. However, measuring leader humility seems to be an ongoing issue among scholars.

Several measures exist for evaluating how humble leaders are. Some are just factors in larger constructs, such as the humility scales in the servant leadership self-reports reported in Dennis and Bocarnea (2005), Ekinici (2015), Hale and Fields (2013), Page and Wong (2000), Reid *et al.* (2014), and Sousa and Van Dierendonck (2015). Similarly, humility scales are developed or evaluated in connection with the HEXACO personality framework (e.g., Ashton and Lee, 2008; Biderman *et al.*, 2019; Gill and Berezina, 2019; Thielmann *et al.*, 2017). Other scales were developed with specificities in mind, such as measures of relational humility (Watkins, 2020), intellectual humility (Haggard *et al.*, 2018), dispositional humility (Sasagawa and Amieux, 2019), and cultural humility (Foronda *et al.*, 2021). Nevertheless, other scales (e.g., Davis *et al.*, 2017; Rowatt *et al.*, 2006) assess humility as a generic construct.

Given the availability of several scales on humility, one may well ask (to use McElroy-Heltzel *et al.*'s (2019) phraseology): Is there any need for further scale development on the humility construct? Swain and Murray (2020) observe that apart from the differences in coverage of the humility domain, the extant measures also operationalise the construct mainly regarding what it is not rather than what it is. Further, the HEXACO-based humility scales seem to conflate humility with modesty or merge it with honesty even though these

constructs are theoretically distinct (Kruse *et al.*, 2017). Again, some measures see humility as a construct not invariant but dependent on time and locational differences (Chancellor and Lyubomirsky, 2013). It was against the background of these shortcomings of the extant measures of humility that Swain and Murray (2020) concluded by encouraging researchers to “continue to explore and refine their methods of assessing humility” (p. 208). Accordingly, the objective of this study is to explore the structure and reliability of the humility scale of Page and Wong’s (2000) Servant Leadership Profile (SLP) in a sample of academic staff selected from the public universities of Saudi Arabia.

## **Background Literature**

### ***Humility in Servant Leadership and Its Measures***

Researchers have defined humility in various ways. Some see it as the absence of some obnoxious traits like arrogance, pride, self-centredness or haughtiness (Coppola, 2021). Some synonymously associate it with concepts like modesty and honesty, but it is unlike these (Burton, 2021). A third category of the researchers see humility as an innate disposition regarding how a person simultaneously see themselves and see others, placing things in perspective, neither overrating nor underrating themselves vis-a-vis others but keeping a balanced view and comporting themselves in a “socially innocuous and conceptually pleasing” (Gerson, 2006, p. 182) manner. This characteristic of social innocuousness is epitomised in the story of the servant Leo who, while overtly a servant to the travelling group, was, in reality, the leading spirit behind the corporate existence of the group, which fell apart with the disappearance of Leo (Greenleaf, 2008). Leo’s humility kept him, as it were, below the radar of the social group’s social hierarchy even while he dominated it structurally.

Humility is a potent power that comes to leaders through service to their constituencies (Sousa and van Dierendonck, 2017). Thus, van Dierendonck and Nuijten (2011) describe humility as a “very important conceptual element of servant leadership” (p. 254). In the context of the university system, academic staff can exert the significant and lasting impact and influence attributed to servant leaders if they genuinely provide service to students, parents, colleagues, the school, and the community at large (Nichols, 2011). However, this service spirit is predicated on a person’s innate humility, a disposition to maintain a balanced perspective about all things. Humility is the essence of servant leadership. Nevertheless, can it be measured with any accuracy and reliability? There are several measures for evaluating humility in servant leaders. Beginning with Page and Wong (2000), most of the extant servant leadership measures have featured a humility scale, some using different nomenclatures such as service, altruism, and subordination (see Table 1). In this study, we explored the psychometrics of the humility dimension of Page and Wong’s (2000) SLP.

Table 1. Examples of the Humility Scale in Some Measures of Servant Leadership

SN	Measures	Scale Names	Items	Sources
1.	Servant Leadership Profile (SLP)	Humility	10	Page and Wong (2000)
2.	Servant Leadership Instrument (SLI)	Service	5	Dennis and Winston (2003)
3.	Servant Leadership Assessment Instrument (SLAI)	Humility	5	Dennis and Bocarnea (2005)
4.	Executive Servant Leadership Scale (ESLS)	Altruism	3	Reed <i>et al.</i> (2011)
5.	Servant Leadership Behaviour Scale (SLBS)	Voluntary Subordination	7	Sendjaya and Cooper (2011)
6.	Servant Leadership Scale (SLS)	Humility	6	Hale and Fields (2013)
7.	Level 5 Leadership Scale (L5LS)	Personal Humility	5	Reid <i>et al.</i> (2014)
8.	School Principals Servant Leadership Behaviours Scale (SPSLBS)	Humility	3	Ekinci (2015)
9.	Short Shared Servant Leadership Measure (SSLM)	Humility	4	Sousa and Van Dierendonck (2015)

### **Humility among Knowledge Workers**

Teachers in Saudi Arabia have been studied as knowledge workers who collaborate with peers across the world to produce patented knowledge (Fallatah, 2021). Humility (Garner *et al.*, 2021), even while being politically sensitive (Salisu and Awang, 2019), is a critical factor facilitating effective collaborations among culturally diverse teams made up of teachers. This comes naturally to teachers in general as humility is a virtue in teaching (Hare, 1992), and teachers use it with equal effectiveness in their many roles, including leadership roles. While their self-esteem as teachers and leaders in higher education could be strengthened through appropriate recognition of their efforts (Price and Weatherby, 2018), it is their humility and satisfaction in what they do that informed their commitment to the students, the profession and their respective workplaces (Willis, 2021). Indeed, the intellectual variant of the humility construct is associated with general knowledge and the tendency to assess one's knowledge accurately (Krumrei-Mancuso *et al.*, 2020). However, given that studies have attested to the high masculinity character of Saudi Arabian national and work cultures (Ayyash *et al.*, 2022) and how it shapes work practices, including servant leadership (Shafai, 2021) and technology adoption (Khan and Qudrat-Ullah, 2021), it is interesting to investigate how leaders in Saudi higher educational institutions measure on the humility criteria.

A sample of 181 academic staff who provided data for this study was drawn from universities of Saudi Arabia. Saudi Arabia is a culturally homogenous country, and the public and private interactions Saudis are deeply grounded in their culture and traditions (Nevo, 1998), which influences their practices and worldviews including the notion of what humility is. Wolfteich *et al.* (2021), in a study of 273 leaders, reported that their conception of humility includes the notions of virtue, accurate self-view, as well as humility in relation to others people. It is, therefore, reasonable to expect a high level of convergence in the humility profile of sampled leaders from a fairly homogenous, such as Saudi Arabia (Thompson, 2019),

especially in the ranks of the Kingdom's university academic staff. The relevant question therefore is: how does the academic staff from Saudi universities respond to the SLHS?

### **Research Methodology**

The study started with a principal component analysis (PCA) of the humility scale of Page and Wong's (2000) SLP. The resultant structure from the PCA was then confirmed using confirmatory factor analysis. Finally, the reliability statistics for the factors were computed using the classical single-test reliability analysis. All computations were carried out in JASP. JASP is a statistical package that offers standard analysis procedures, including descriptive and factor analyses (Bergh *et al.*, 2021).

### **Participants and Survey Administration**

Participants were academic staff selected from the 30 government universities in Saudi Arabia. Two ways were utilised in recruiting participants. First, the first author (a Saudi citizen from the academia) used his contacts and distributed 300 questionnaires (Google form link) to Saudi Academics on his WhatsApp contacts list. The Google form was designed based on the forced answering option. However, to pre-empt the common problem of high non-response associated with the forced answering option (Sischka *et al.*, 2020), the questionnaire contains only the ten items of the humility factor of Page and Wong's (2000) SLP. Three hundred received the survey Google form link via WhatsApp; 46.67% responded.

Secondly, the researcher extracted the emails of corresponding authors with affiliation to universities in Saudi Arabia from the Scopus database. The query (AFFILCOUNTRY("Saudi Arabia") AND SUBJAREA(ARTS OR BUSI OR DECI OR ECON OR PSYC OR SOCI) AND PUBYEAR > 2015 AND PUBYEAR < 2021 AND (LIMIT-TO (AFFILCOUNTRY,"Saudi Arabia")))) in the Scopus database yielded 11,704 documents authored by 160 scholars. Mindful of the ethical requirement of informed consent in online sourcing of survey respondents (Roberts and Allen, 2015), the researchers extracted the balance of 41 respondents from the 160 scholars. Thus, the study used data collected from a sample of 181 respondents.

### **Measure**

The Page and Wong's (2000) SLP is a 99-item self-report questionnaire that covers a vast domain of the servant leadership construct across twelve dimensions: integrity (8 items), humility (10 items), servanthood (11 items), caring for others (8 items), empowering others (5 items), developing others (7 items), visioning (8 items), goal setting (6 items), leading (10 items), modelling (6 items), team-building (11 items), and shared decision-making (8 items). The items were evaluated using a 7-point Likert-type rating scale ranging from 1 = Strongly disagree to 7 = Strongly agree. Page and Wong (2000) reported a pre-test result in which the SLP performed with a Cronbach's  $\alpha = 0.937$ . However, the humility scale showed an  $\alpha = 0.656$ . A sample of two items from the scale include: "I learn from subordinates whom I serve," and "I readily confess my limitations and weaknesses" (Page and Wong, 2000, p. 105).

It is noteworthy that the twelve dimensions of Page and Wong's (2000) SLP cover a domain far beyond what the general literature on servant leadership typically assumes. Indeed, the factor structure of the SLP established in Dennis and Winston (2003) admits only three dimensions: namely, empowerment, service (covering some of the humility items), and vision.

## Results and Discussion

### Descriptive Statistics

There were no missing data as we used the forced answering option available on Google form (Kmetty and Stefkovics, 2021). The data thus collected were screened for outliers by the z-score approach (Chikodili *et al.*, 2021) using Microsoft Excel®. A single outlier was detected and deleted from the sample dataset.

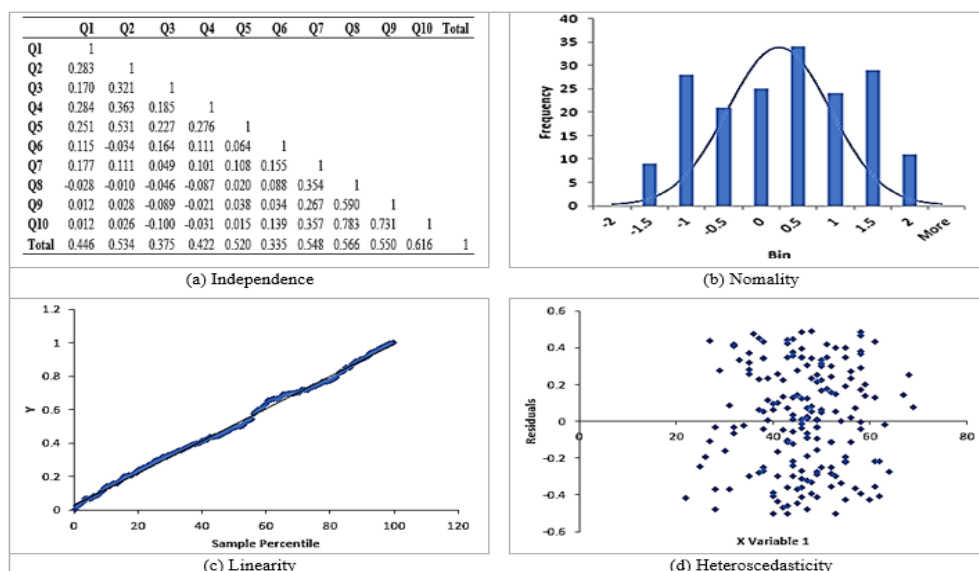


Figure 1. Assumption Checks

The cleaned dataset was then analysed for additivity, normality, linearity, and heteroscedasticity in Microsoft Excel®. The additivity test (Figure 1a) confirmed that no two of the ten indicators of the humility scale were perfectly correlated, suggesting that they are independent of each other. The dataset also met the linearity assumption, as shown in Figure 1c. Figure 1d indicates that the residuals were relatively evenly spread in the dataset, suggesting good homoscedasticity and homogeneity. However, the histogram (Figure 1b) suggest some slight non-normality in the dataset. Overall, the assumption checks carried out suggest that the dataset is good.

However, Looney (1995) suggests that it is better to use aggregates of more than one test in testing for normality. Thus, the results of the assumption checks were further complemented with further results (for kurtosis and skewness) processed in JASP to be doubly sure about the normality of the dataset, which is an important requirement for running EFA (Watkins, 2018). Additionally, González-Estrada and Cosmes (2019) recommend running the Shapiro-Wilk test because of its superior sensitivity to normality in datasets. The descriptive statistics from JASP in Table 2 show the skewness and kurtosis of the dataset and the Shapiro-Wilk test results. Skewness kurtosis statistics suggest a slightly non-normal distribution. Similarly, the conventional alpha (0.05) is greater than the p-value of the Shapiro-Wilk test (<0.001) for all items, suggesting that the dataset may be non-normal. The slight non-normality of the study data is not problematic when considered against the typical skewness (-2.49 and 2.33) and kurtosis (-1.92 and 7.41) Blanca *et al.* (2013) found in actual data samples.

Table 2. Descriptive Statistics, Skewness, Kurtosis, and Shapiro-Wilk Test

Item	Mean			Skewness		Kurtosis		Shapiro -Wilk	P-value (S-W)
	Stat.	SE	SD	Stat.	SE	Stat.	SE		
Q1	4.702	0.130	1.754	-0.497	0.181	-0.872	0.359	0.907	< .001
Q2	4.696	0.138	1.862	-0.279	0.181	-1.194	0.359	0.898	< .001
Q3	4.757	0.140	1.882	-0.528	0.181	-0.734	0.359	0.899	< .001
Q4	5.320	0.127	1.708	-0.902	0.181	-0.076	0.359	0.856	< .001
Q5	5.144	0.147	1.978	-0.733	0.181	-0.781	0.359	0.836	< .001
Q6	4.912	0.111	1.499	-0.858	0.181	0.143	0.359	0.891	< .001
Q7	4.464	0.139	1.875	-0.178	0.181	-1.275	0.359	0.906	< .001
Q8	4.210	0.148	1.994	-0.073	0.181	-1.301	0.359	0.911	< .001
Q9	3.939	0.145	1.956	0.054	0.181	-1.172	0.359	0.924	< .001
Q10	4.155	0.141	1.900	-0.062	0.181	-1.074	0.359	0.927	< .001

Note.  $n = 181$ ; Minimum = 1; Maximum = 7; SD = Standard Deviation; Stat. = Statistic

### Principal Component Analysis

Jackson (1991) recommends PCA for factor structure of datasets. Accordingly, a PCA was computed for Page and Wong's (2000) 10-item humility dimension of the SLP using JASP. In computing the PCA, the researchers applied the minimum residual estimation method (Comrey, 1962) and calculated the eigenvalues using the oblimin technique of oblique rotation (Crawford, 1975), with a cut-off point of .40 (the default in JASP) and Kaiser's (1958) criterion of eigenvalues  $> 1$ . The eigenvalues were plotted to form a scree plot (Cattell, 1966). The oblique rotation method was selected rather than the orthogonal rotation because personality-related traits are invariably correlated and oblique within the factor space and cannot be orthogonal (Lee and Ashton, 2007). Oblique rotation allows highly correlated factors to merge into one, thereby creating a simpler factor structure (Zhang and Preacher, 2015). Based on the component loadings in Table 3 and analysis of the scree plot in Figure 2, two components were extracted ( $\chi^2 = 77.648$ ;  $df = 2.99$ ;  $p < .001$ ) with a cumulative variance of 49% and acceptable component loadings (ranging between 0.531 and 0.927).



Table 3. Component Loadings

Items/ Component Characteristics	Component Loadings		
	RC1	RC2	Uniqueness
Q1	0.029	0.587	0.654
Q2	0.007	0.770	0.407
Q3	-0.112	0.544	0.691
Q4	-0.056	0.636	0.593
Q5	0.033	0.710	0.496
Q6	0.173	0.215	0.924
Q7	0.531	0.265	0.649
Q8	0.874	-0.039	0.235
Q9	0.827	-0.011	0.315
Q10	0.927	-0.010	0.140
Eigenvalue	2.648	2.248	
Proportion variance	0.265	0.225	
Cumulative variance	0.265	0.490	

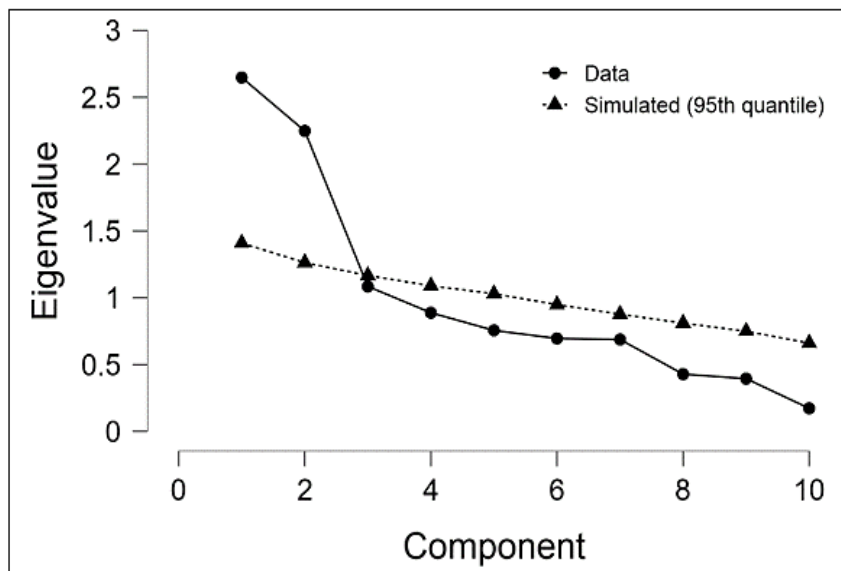


Figure 2. PCA Scree Plot

The first component consists of four indicators with an eigenvalue of 2.648 and explains 27% of the variance. The second component consists of five indicators with an eigenvalue of 2.248 and explains 23% of the variance. The 6th indicator (coded Q6), with a uniqueness score of 0.924, failed to load on either factor, indicating it is largely unrelated to the SLHS. Willingness to serve, ready admittance of shortcomings, celebrating others', not self-accomplishments, and acknowledgement of their dependence on others to accomplish things (respectively captured by the 7th to 10th indicators), aligns with scholars' description of the servant leader as an essentially humble person (LaBouff *et al.*, 2012; Wright *et al.*, 2018). Thus, the researcher labelled the first component as Humbleness. The five indicators that comprised the second component captured that servant leadership quality that shows them as downplaying their accomplishment without erasing the fact but makes them "socially innocuous and conceptually pleasing" (Gerson, 2006, p. 182). We labelled this factor Self-

effacement. The two-factor model of SLHS thus generated was subjected to confirmatory factor analysis (CFA) to verify the factor structure of the nine indicators measuring the SLHS.

### **Confirmatory Factor Analysis**

The researchers performed a CFA to test whether the data collected from the sample of 181 academic staff from Saudi universities fitted the two-factor solution suggested by the results of the PCA. We used the following fit indices: chi-squared test ( $\chi^2/df$ ), root mean square error of approximation (RMSEA), standardised root mean square residual (SRMSR), comparative fit index (CFI), Tucker-Lewis index (TLI), the goodness of fit index (GFI), McDonald fit index (MFI), and normed fit index (NFI). The researchers used the threshold of acceptance for the various computed indices in interpreting them. Thus, these cut-off thresholds were used in the interpretation:  $\chi^2/df \geq 2$  (Tabachnick and Fidell, 2014);  $TLI \geq 0.95$  (Shi *et al.*, 2019);  $GFI \geq 0.95$  (Miles and Shevlin, 2007);  $NFI > 0.90$  (Bentler and Bonett, 1980);  $RMSEA \leq 0.07$  (Steiger, 2007);  $CFI \geq 0.95$ ,  $MFI \geq 0.90$  and  $SRMR < 0.08$  (Hu and Bentler, 1999). All the fit indices are available in JASP.

The 9-item two-factor model of the SLHS was assessed based on the preceding parameters of CFA. The CFA results indicate an overall good model fit ( $\chi^2/df = 0.863$ ,  $CFI = 1.000$ ,  $TLI = 1.011$ ,  $NFI = 0.954$ ,  $RMSEA = 0.000$ ,  $SRMR = 0.051$ ,  $GFI = 0.974$ ,  $MFI = 1.010$ ). Table 4, showing parameter estimates of the test, indicates that item factor loadings are  $> 0.7$ , except for item Q1, which returned an estimate of 0.685. The item z-values ranged between 5.063 and 16.568 (for the humbleness factor) and 4.727 and 9.671 (for the self-effacement factor), suggesting that the model is significant at  $p < 0.001$  level. The model is visualised in Figure 3.

Table 4. Parameter Estimates of CFA

Factors	Indicator	Estimate	SE	z-value	p	95% CI	
						Lower	Upper
Factor 1 (Humbleness)	Q7	0.700	0.137	5.063	< .001	0.427	0.966
	Q8	1.599	0.128	12.523	< .001	1.349	1.850
	Q9	1.460	0.128	11.393	< .001	1.209	1.711
	Q10	1.846	0.111	16.568	< .001	1.627	2.064
Factor 2 (Self-Effacement)	Q1	0.685	0.145	4.738	< .001	0.402	0.969
	Q2	1.483	0.153	9.671	< .001	1.182	1.783
	Q3	0.733	0.155	4.727	< .001	0.429	1.038
	Q4	0.792	0.139	5.692	< .001	0.520	1.065
	Q5	1.279	0.160	7.993	< .001	0.965	1.592

While the model depicted in Figure 3 seems to be backed by excellent fit statistics and parameter estimates (Table 4), it is important to inquire whether it is a well-fitting model and may suffer disadvantages associated with such models. One such concern is that an over-fitted model may indicate the existence of possible equivalent or non-equivalent models (MacCallum *et al.*, 1993). In other words, there may be other similar or dissimilar models that could fit the same data equally well. Two models could be identified as equivalent when they “reproduce the same set of covariance matrices even when their parameters vary” (Henley *et al.*, 2006, p. 518). Tomarken and Waller (2003) also recommend that researchers could

"acknowledge the presence of plausible equivalent models" or "evaluate lower-order model components" (p. 596), among others, as ways to identify equivalent models.

Following Henley *et al.*'s (2006) suggestion, the researchers produced and examined the covariance matrices for the two-factor solution and a unidimensional solution (see Table 5 and Table 6, respectively). The matrices are not the same; hence the two models are not equivalent. Further, based on Tomarken and Waller's (2003), the researchers re-run the PCA where they manually constrained JASP to produce a unidimensional solution using the oblimin technique of oblique rotation. The result eliminated the self-effacement indicators, returning the four humbleness items with slightly different item factor loadings as a unidimensional construct ( $\chi^2=192.404$ ,  $df=35$ ,  $p < .001$ ; cumulative variance=27%). It is not an equivalent model, so no CFA was carried out. To exhaust possibilities, the researchers also then run the 9-item of the SLHS dual-factor model through the CFA procedure but as a unidimensional construct. With the exception of SRMR, all the other fit indices computed in this study rejected the unidimensional model of the SLHS ( $\chi^2/df = 5.582$ , CFI = 0.727, TLI = 0.636, NFI = 0.692, RMSEA = 0.159, SRMR = 0.050, GFI = 0.810, MFI = 0.711). Thus, the good model fit of our initial solution is not diminished by the possibility of model equivalence problem due to being a well-fitted solution.

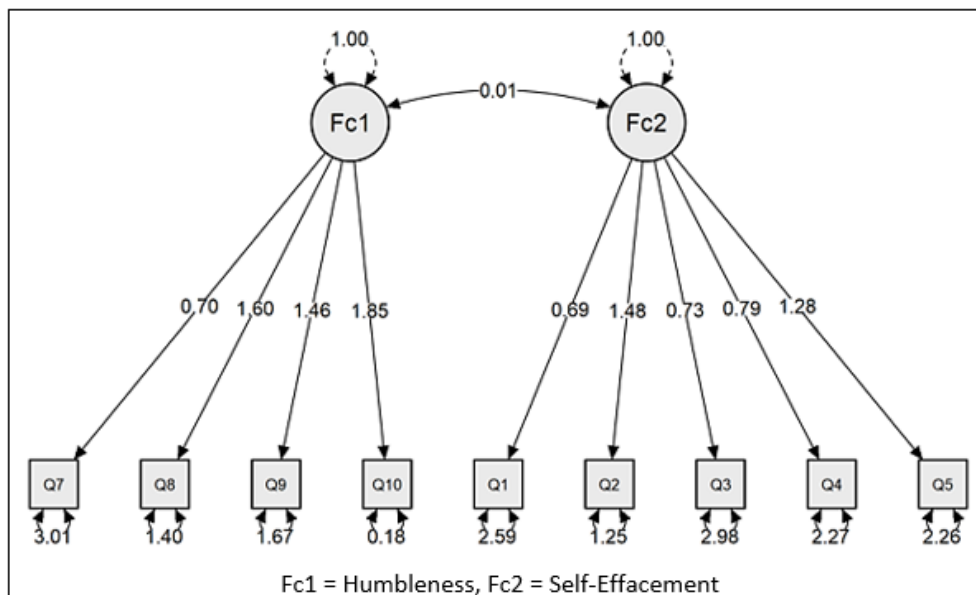


Figure 3. Model Plot with Parameter Estimates.

Table 5. Residual Covariance Matrix (Initial Two-Factor Solution)

Q7	Q8	Q9	Q10	Q1	Q2	Q3	Q4	Q5
< .001								
0.204	< .001							
< .001	< .001	< .001						
< .001	< .001	0.006	< .001					
0.577	< .001	0.036	0.033	< .001				
0.378	< .001	0.090	0.074	< .001	< .001			
0.170	< .001	< .001	< .001	0.055	0.032	< .001		
0.317	< .001	< .001	< .001	0.304	< .001	0.010	< .001	
0.392	0.068	0.135	0.041	< .001	0.048	< .001	< .001	< .001

Table 6. Residual Covariance Matrix (Unidimensional Solution)

Q7	Q8	Q9	Q10	Q1	Q2	Q3	Q4	Q5
< .001								
0.207	< .001							
< .001	< .001	< .001						
< .001	< .001	0.005	< .001					
0.566	< .001	0.013	0.003	< .001				
0.352	< .001	0.036	0.007	0.919	< .001			
0.301	0.122	< .001	< .001	0.561	1.128	< .001		
0.363	< .001	0.019	0.012	0.848	1.150	0.581	< .001	
0.371	0.020	0.092	< .001	0.865	1.942	0.848	0.929	< .001

**Reliability Analysis**

An instrument’s reliability score is a measure of its replicability and generalisability. These are important characteristics a scale should possess to be of any use to the research community. Thus, support for the two-factor model of the SLHS requires (a) acceptable reliability for each factor (i.e.,  $\alpha \geq 0.70$ ) (Nunnally and Bernstein, 1994). The reliability results of the SLHS given in Table 7 suggest that the items making up the humbleness factor are internally consistent, as indicated by the factor’s McDonald’s omega ( $\omega = 0.833$ ) and Cronbach’s alpha ( $\alpha = 0.810$ ). However, the average inter-item correlations (CI 0.431–0.592) marginally exceeds Clark and Watson’s (1995) recommended threshold of 0.15–0.50. But while the average inter-item correlations for the self-effacement factor falls within this threshold, the internal consistency reliability statistic is mediocre or poor ( $\omega = 0.685$ ;  $\alpha = 0.671$ ), to use Kaiser’s (1974) or Westland’s (2019) interpretations, respectively. Curiously, the performance of the self-effacement factor reflects that of the humility factor reported in Page and Wong’s (2000) pre-test results.

Table 7. Single-Test Reliability Analysis for  $\omega$  and  $\alpha$ .

Factors	Estimates	McDonald’s $\omega$	Cronbach’s $\alpha$	AIC
Factor 1 (Humbleness)	Point estimate	0.833	0.810	0.514
	95% CI lower bound	0.795	0.759	0.431
	95% CI upper bound	0.872	0.852	0.592
Factor 2 (Self-Effacement)	Point estimate	0.685	0.671	0.289
	95% CI lower bound	0.614	0.588	0.223
	95% CI upper bound	0.756	0.741	0.357

It should be borne in mind that the commonly used reliability metrics such as Cronbach’s  $\alpha$  tend to underestimate an instrument’s reliability where the commonalities of each item are not the same (Hancock and An, 2020). Therefore, the reliability metrics of the self-effacement factor should be appreciated against the widely recognised shortcomings of the Cronbach’s  $\alpha$  (as well as McDonald’s  $\omega$ ) as a scale reliability metric (Cho, 2021). Indeed, it was argued that the theoretical context of the target construct is critical in the determination of its reliability and that “the average interitem correlation (which is a straightforward measure of internal consistency) is a much more useful index than coefficient alpha per se (which is not)” (Clark and Watson, 1995, p. 316). Accordingly, the self-effacement factor is

deemed reliable because it is theoretically a crucial element in servant leadership theory and because its average inter-item correlation reported in this study is acceptable.

### Conclusion and Recommendation for Further Research

In this study, the researchers explored the factor structure and internal consistency reliability of the SLHS in a sample of 181 academic staff from Saudi Arabian universities. The SLHS showed excellent psychometrics with the potential of a reliable tool for assessing the humility in people from similar climates. As a people brought up under the guidance of the Arab cultural norms that holds humility as a cardinal virtue, the Saudi academics are expected to exhibit a high-level humility. The excellent model fit of the humbleness factor in the SLHS evaluated supports this expectation, even as they prove to be less self-effacing. Thus, the SLHS has the potential to gauge the humility trait across different population types. The most significant contribution of this study is the confirmation of the two-factor structure and consistency reliabilities of the SLHS that could be employed in assessing the humility dispositions of teachers/university academics for various purposes, including recruitment and promotion assessments into a leadership position. However, the cross-cultural invariance of the scale must first be established for this potential to be fully realised.

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