

Structural Equivalence of the Barbuto and Wheeler (2006) Servant Leadership Questionnaire on North American and South African Samples

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The Servant Leadership Questionnaire (Barbuto & Wheeler, 2006) was applied to 417 salespersons from 100 dealerships operated by an automobile retailer in South Africa. The structural invariance of the instrument was investigated by means of item analysis as well as exploratory and confirmatory factor analyses. Item analyses indicated that the items all correlated very highly with each other and formed part of the same construct. The five-factor structure identified by the authors of the instrument could not be replicated by the exploratory factor analyses carried out on the responses of the present sample. A unidimensional structure seemed to represent the best fit with the data when confirmatory factor analyses were performed to determine the configuration of the measurement model.

This report contains the results of a study on the metric equivalence, specifically the configuration equivalence, of the Servant Leadership Questionnaire (SLQ) developed by Barbuto and Wheeler (2006).

Servant leadership, first identified by Greenleaf (1970), is based on the premises that a successful leader must be willing to primarily and principally serve the interests and needs of his or her followers, assisting the development of these followers to become leaders. In recent years, the notion has attracted considerable attention in the form of theoretical and empirical papers (e.g., Blanchard, 2000; Buchen, 1998; Drury, 2005; Graham, 1991; Nwogu, 2004; Patterson, 2003; Quay, 1997; Sendjaya & Sarros, 2002; Spears, 1995, 1998; Winston, 2003). These publications mainly addressed the notion from a conceptual point of view and generally called for empirical research into the relationship between this and other variables in the organizational behavior field.

There have been empirical studies on the relationship between servant leadership and other variables (Irving, 2005; Parolini, 2004). And, there have been attempts to develop an instrument to measure servant leadership on an organizational or individual basis (Dennis &

Bocarnea, 2005; Laub, 1999; Sendjava, 2003). A measuring instrument developed by Barbuto and Wheeler (2006) followed—the SLQ.

Measurement invariance (or measurement equivalence) has been receiving a significant amount of attention in recent years. This may be ascribed to the internationalization, in fact globalization, of business organizations that have made it necessary to have measuring instruments that can, with confidence, be applied to individuals from different cultural backgrounds. Vandenberg and Lance (2000) provided evidence that more attention is and should be given to this aspect of measurement in the organizational behavior field but that more work is to be done in this regard.

The aim of the present study was to determine the measurement equivalence, specifically the configurational equivalence, of the Barbuto and Wheeler (2006) SLQ, developed in the United States of America, when applied to a South African sample of employees working in the automobile retail field.

Method

Participants

The study was conducted in an automobile retail organization with 100 dealerships spread across South Africa. Having so many outlets over a wide geographical area makes the organization's distribution system of new and used vehicles one of the largest in the South African industry. The organization was chosen as it was considered to meet the following criteria that were determined prior to commencement of the study. The research organization had to have a strong balance sheet, indicative of a stable company; clearly defined and focused business strategies; a clearly identified brand; clearly defined work teams and a declared orientation and developed program towards making sales teams effective; formally expressed people oriented leadership; a chief executive known to have a listen-and-learn approach; and an organizational culture perceived to be diverse and containing individuals from the different ethnic groups present in South Africa. It was determined that the research organization met these criteria to a large extent.

For the purposes of the study, the sales manager(s) were regarded as the team leader(s). All the sales teams had been functioning for at least 1 year before the data collection started. Team leaders assessed the effectiveness of their teams. In turn, team members assessed the servant leadership behavior of their team leaders; their own trust in the organization, the management of the organization, and their coworkers; and their personal commitment to the team of which they were a member. The present paper is only concerned with the responses to the instrument measuring the servant leadership behavior of the team leaders (sales managers).

Of the 114 sales managers included in the study, 16 were women and 98 men, respectively constituting 14% and 86% of the sample. The mean age of the managers was 39.1 years ($SD = 8.73$), and the mean number of years in their current jobs as managers was 3.82 years. Individuals seeing themselves as Whites, Indians, Blacks, and Coloreds (term refers to a heterogeneous group of people who possess some degree of sub-Saharan ancestry in South Africa) respectively formed 84.2%, 9.6%, 4.4%, and 1.8% of the sample. Fifty percent of the respondents indicated their current home language as Afrikaans, while 46.5% regarded English as their current home language. The majority of sales managers (52.6%) had at least 12 years of education, while 46.5% had either a post-school certificate or diploma or a university degree.

The sales persons were individuals working on the sales floors of the dealerships; selling, in different combinations, new and/or used commercial and/or passenger vehicles of a wide variety of trade names. There were 417 individuals in this group; 96 (23%) women and 321 (77%) men. The mean age of the sales persons was 36.3 years ($SD = 16.8$). Slightly more than half (52.8%) had a maximum of 12 years of education, while 42.7% had a post-school certificate or diploma or a university degree. The mean job tenure as a sales person was 4 years. Whites formed 68.8% of the sample, Blacks 14.9%, Indians 12.2%, and Coloreds 4%. Of the sample, 40% reported that their current home language was Afrikaans, 41.6% English, and 4.6% indicated their home language as Zulu. The remainder of the sample was distributed over the eight other South African official languages. Christians formed 66.7% of the sample, Protestants formed 45.5%, and Catholics 21.2%.

Measuring Instruments

Data gathering was done by means of a combination questionnaire containing three measuring instruments. The three questionnaires were (a) the rater version of Barbuto and Wheeler's (2006) SLQ, (b) Ferres' (2001) Workplace Trust Survey (WTS), and (c) Bennett's (1997) Team Commitment Survey (TCS). Apart from these instruments, the composite questionnaire also contained demographic questions.

All sales persons who could be accessed by e-mail received the composite questionnaire. Sales managers who could be reached by e-mail received a questionnaire containing 11 questions aimed at measuring the sales managers' views on the effectiveness of the sales teams under their direction.

For the purposes of this paper, more information is provided on the SLQ only. Barbuto and Wheeler (2006) proposed a conceptualization of the servant leadership construct that combined the 10 characteristics of servant leaders identified by Spears (1995). They added the dimension of *calling*, meaning the desire to serve others, which is also seen in the early work of Greenleaf (1970) and other scholars in the field (Akuchie, 1993; Farling, Stone, & Winston, 1999; Graham, 1991; Sendjaya & Sarros, 2002). Subsequently, Barbuto and Wheeler developed operational definitions of the dimensions of the construct, as they interpreted it, and wrote five to seven items to represent each of the 11 resulting possible subscales. Further study of the construct and revision of items followed to eliminate difficult or perplexing language and/or grammar. Examination of face validity followed this process.

To determine the psychometric properties of the envisaged questionnaire, Barbuto and Wheeler (2006) administered it to 80 elected community leaders and 388 members of a statewide professional organization. Exploratory factor analyses were then carried out on the collected data. This resulted in a reduced set of 23 items loading strongly and uniquely on five factors: altruistic calling, emotional healing, wisdom, persuasive mapping, and organizational stewardship. The internal reliability coefficients of the factors ranged between .82 and .95, and the dimensions of the rater version of the questionnaire (used in the present study) correlated substantially with each other. Of the 10 correlations between the dimensions, 7 were above .50, with 5 being higher than .60. The authors of the instrument carried out confirmatory factors analysis using LISREL (version 8.54) on the five-factor structure. The obtained fit indices indicated a good fit between the measurement model (factor structure) and the data.

The psychometric and conceptual information on the SLQ that Barbuto and Wheeler (2006) provided led to the decision to use the questionnaire as measure of servant leadership in

the present study. Another reason for using the SLQ was its ability to assess servant leadership behavior of individuals (sales managers) as opposed to measuring servant leadership levels in the whole organization, as could be done by means of another available instrument, Laub's (1999) (Servant) Organization Leadership Assessment.

Procedure

The material in the composite questionnaire and all other material used in the study were translated from English into Afrikaans using the translation-retranslation approach advocated by Brislin (1970). Executing a survey electronically does not change the basic nature of this kind of research. There are, however, specific aspects of an electronic survey that can be seen as advantageous. Turnaround time is usually decreased; many people respond to e-mail messages soon after receiving it (Zats, 2000). This was supported in the present study; since 137 responses were received within 24 hours after the questionnaires had been sent out, representing 25.8% of the total responses. Three follow-up reminders were sent out to prompt individuals to complete the questionnaires. An overall response rate of 72.1% was achieved. Other advantages of the electronic survey method include the computer mainly handling the data entry, reducing errors and problems with missing values; the elimination of handwriting issues; lower costs, due to no printing or postage and less paper waste; and accelerated data analysis and feedback.

Zats (2000) pointed out that doing surveys electronically does pose some problems. Firstly, potential respondents must have access to e-mail and be able to respond to messages sent by means of this method. In the present study, only 31 of the 767 messages sent to potential respondents could not be delivered. A second problem is the nonanonymous nature of e-mail communication. In the present study; an outside person was used to control the website, organize the responses, and remove information that could lead to the possible identification of an individual's name and/or position.

Some additional problems had to be overcome. The organization where the research was done had created barriers at the e-mail servers in order to avoid overloading their system. This meant that the e-mail messages to potential participants had to be sent in batches of fewer than 50 at a time. Sending the messages to all the potential participants took about 12 hours instead of the envisaged few minutes. Secondly, careful time-frame planning had to be carried out as the data gathering started 6 weeks before the onset of the summer holiday season. Participants were made aware of this constraint, and a date for the return of the questionnaires was carefully set.

An effort was made to get as many potential respondents as possible involved in the study by communicating it as widely as possible throughout the organization. To avoid a situation where potential respondents ignored the message, the human resources director sent out an e-mail notice which announced the survey and indicated the organization's permission for the study to be carried out. In this notice, the independence of the researchers was also stressed. Respondents were allowed to complete the questionnaire during working hours.

Since electronic data gathering is a relatively new approach with widely varying procedures, more details on data collection are provided. A research website was established. A third party information technology specialist electronically programmed the composite questionnaire. Several dummy runs were carried out before the survey was officially launched. The e-mail addresses of the sales persons were obtained from the employing organization. Access to the research population was gained through these e-mail addresses. The sales persons and the sales managers each received an e-mail message consisting of a cover letter which

briefly explained the reason for the survey and instructions, the relevant questionnaire, and a web address to which the completed questionnaires had to be returned (this function was activated by clicking on the submit-button at the very end of the questionnaire). The e-mail message and questionnaire were sent in English and in Afrikaans. The option existed for the respondent to complete the survey in either of the two languages. The only identification that a respondent had to provide was the dealership to which he or she belonged. This was necessary as it had to be possible to link the sales managers' and sales persons' responses to each other. A quantitative approach was used to analyze the data. Due to the nature of the study, both bivariate and multivariate procedures were employed.

Results

The aim of the data analysis procedures was to determine the configurational (structural) equivalence of Barbuto and Wheeler's (2006) SLQ when applied to a South African sample of employees ($N = 417$) in the automobile retail sector compared to the results on the validation sample used by the authors of the instrument. Only the construct validity of the instrument when applied to the South African sample is investigated in this paper. All analyses were carried out by means of the SPSS set of statistical procedures, augmented by the use of LISREL 8.3.

Whether the 23 items in the SLQ formed part of the same construct was investigated first. Item analysis was carried out for this purpose. The corrected item-total correlations of the 23 items are shown in Table 1. The items in the SLQ all seemed to form part of the same construct. The corrected item-total correlations are all above .75. The value of Cronbach alpha for the 23 items was .981.

The item analyses were extended by calculating the item-total correlations of the items in the different subscales of the SLQ as well as the Cronbach alpha coefficients of the subscales. The results of these analyses are shown in Table 2. All five factors in the questionnaire had Cronbach alpha coefficients $> .90$ when applied to the present sample. Taken together with the finding of the 23 items having a Cronbach alpha that also exceeded .90, the conclusion seemed to be that the items were very closely related to each other. This is also clearly seen when the corrected item-total correlations in Table 2 are inspected. These values were mostly above .80; only two fell below that level but were above .70.

To determine how well the factor structure identified by Barbuto and Wheeler (2006) fit the responses from the present sample, a confirmatory factor analysis was carried out. The factor structure found by Barbuto and Wheeler was imposed on the responses of the present sample. Parcelling of items was done by randomly assigning items to four parcels. The fit indices obtained from this analysis are shown in Table 3. The factor structure identified by Barbuto and Wheeler did not fit the responses of the present sample entirely satisfactorily. The incremental fit indices did reach satisfactory levels, mainly above .90. The value of the standardized RMR is also at a satisfactory level at .021. However, the value of RMSEA was relatively high at .15, higher than the value of .08 or even .10 that the index ought to reach to indicate a good fit between the data and the measurement model. The 90% confidence interval for the value of RMSEA was at the lower end. The value of chi-square could not be interpreted reliably as the sample size exceeded 200, the number at which the obtained value of chi-square tends to become unreliable. The value of the normed chi-square was, however, 14.30; numerically well beyond the range of 2 to 5 that would point to a well-fitting measurement model.

Table 1: *Corrected Item-Total Statistics (N = 417)*

| Servant-leadership item | Corrected item-total correlation | Cronbach's alpha item deleted |
|-------------------------|----------------------------------|-------------------------------|
| SL1 | 0.779 | 0.981 |
| SL2 | 0.754 | 0.981 |
| SL3 | 0.825 | 0.981 |
| SL4 | 0.796 | 0.981 |
| SL5 | 0.724 | 0.981 |
| SL6 | 0.822 | 0.981 |
| SL7 | 0.863 | 0.980 |
| SL8 | 0.796 | 0.981 |
| SL9 | 0.860 | 0.980 |
| SL10 | 0.782 | 0.981 |
| SL11 | 0.856 | 0.980 |
| SL12 | 0.820 | 0.981 |
| SL13 | 0.772 | 0.981 |
| SL14 | 0.886 | 0.980 |
| SL15 | 0.839 | 0.980 |
| SL16 | 0.856 | 0.980 |
| SL17 | 0.840 | 0.980 |
| SL18 | 0.879 | 0.980 |
| SL19 | 0.852 | 0.980 |
| SL20 | 0.851 | 0.980 |
| SL21 | 0.885 | 0.980 |
| SL22 | 0.853 | 0.980 |
| SL23 | 0.894 | 0.980 |

Table 2: *Correct Item-Total Statistics: Original Factors (N = 417)*

| Factor 1 | Item-total correlation | Cronbach's alpha item deleted |
|----------------|------------------------|-------------------------------|
| Items | | |
| 1 | 0.815 | 0.938 |
| 11 | 0.851 | 0.927 |
| 16 | 0.891 | 0.914 |
| 21 | 0.889 | 0.915 |
| Factor 2 items | | |
| 8 | 0.862 | 0.929 |
| 12 | 0.907 | 0.915 |
| 13 | 0.840 | 0.938 |
| 17 | 0.866 | 0.928 |
| Factor 3 items | | |
| 3 | 0.895 | 0.944 |
| 4 | 0.883 | 0.946 |
| 7 | 0.840 | 0.954 |
| 9 | 0.925 | 0.939 |
| 22 | 0.857 | 0.950 |
| Factor 4 items | | |
| 5 | 0.724 | 0.925 |
| 6 | 0.789 | 0.916 |
| 10 | 0.800 | 0.912 |
| 14 | 0.874 | 0.897 |
| 18 | 0.872 | 0.897 |
| Factor 5 items | | |
| 2 | 0.773 | 0.941 |
| 15 | 0.863 | 0.926 |
| 19 | 0.880 | 0.923 |
| 20 | 0.841 | 0.930 |
| 23 | 0.869 | 0.924 |

Table 3: *Fit Indices: Original Factorial Structure (N = 417)*

| Fit Indices |
|---|
| Degrees of freedom = 5 |
| Minimum fit function Chi-square = 71.51 ($p = 0.00$) |
| Normal theory weighted least square Chi-square = 71.89 ($p = 0.00$) |
| Satorra-Bentler scaled Chi-square = 51.63 ($p = 0.00$) |
| Chi-square corrected for nonnormality = 51.83 ($p = 0.00$) |
| Estimated noncentrality parameter (NCP) = 46.63 |
| 90% confidence interval for NCP = (27.19; 73.53) |
| Minimum fit function value = 0.17 |
| Population discrepancy function value (FO) = 0.11 |
| 90% confidence interval for FO = (0.065; 0.18) |
| Root mean square error for approximation (RMSEA) = .15 |
| 90% confidence interval for RMSEA = (0.11; 0.19) |
| P-value for Test of close fit (RMSEA < 0.05) = 0.00 |
| Expected cross-validation index (ECVI) = 0.17 |
| 90% confidence interval for ECVI = (0.13; 0.24) |
| ECVI for saturated model = 0.072 |
| ECVI for independence model = 6.87 |
| Chi-square for independence model with 10 df = 2849.92 |
| Independence AIC = 2859.92 |
| Model AIC = 30.00 |
| Saturated AIC = 30.00 |
| Independence CAIC = 2885.09 |
| Model CAIC = 121.96 |
| Saturated CAIC = 105.50 |
| Normed fit index (NFI) = 0.97 |
| Nonnormed fit index (NNFI) = 0.95 |
| Parsimony normed fit index (PNFI) = 0.49 |
| Comparative fit index (CFI) = 0.98 |

Fit Indices cont.

Incremental fit index (IFI) = 0.98

Relative fit index (FRI) = 0.95

Critical N (CN) = 88.78

Root mean square residual (RMR) = 1.24

Standardized RMR = 0.021

Goodness of fit index (GFI) = 0.94

Adjusted goodness of fit index (AGFI) = 0.81

Parsimony goodness of fit index (PGFI) = 0.31

The five factors found by Barbuto and Wheeler (2006) correlated quite highly with each other. The correlations are shown in Table 4.

Table 4: *Pearson Correlations among Dimensions identified by Barbuto and Wheeler (N = 417)*

| | Altrus | Emot | Wis | Pers | Stew |
|--------|--------|-------|-------|-------|------|
| Aktrus | 1 | | | | |
| Emot | 0.826 | 1 | | | |
| Wis | 0.813 | 0.725 | 1 | | |
| Pers | 0.843 | 0.805 | 0.872 | 1 | |
| Stew | 0.854 | 0.781 | 0.875 | 0.871 | 1 |

Consequently, a question was raised with regard to the independence of the dimensions of the rater-version of the SLQ. It was decided to carry out exploratory factor analysis on the responses of the participants of the present sample. It was felt that this procedure would possibly shed more light on the structure of the instrument. Principal factor analysis was preferred as the extraction method, and an oblique rotation was specified. This was in line with the thinking of Gorsuch (1997) and Kerlinger and Lee (2000) who agreed regarding the problems related to using principal components extraction and to orthogonal rotation of the axes, causing principal factor analysis with oblique rotation of the axes to be preferred. The value of the KMO measure of sampling adequacy is .975. Since this is $> .60$, this indicates that carrying out factor analysis on the data is feasible. In the first round of the principal factor analysis, two eigen values > 1.00 (16.49 and 1.20) were obtained. A scree plot was developed and confirmed the possibility of the existence of two factors. The rules that were followed to determine the number of factors to be extracted and the items to be included during exploratory factor analysis were:

1. The number of factors to be extracted should not be more than the number of eigen values > 1.00 .
2. An item not loading > 0.30 on any factor will be excluded.
3. An item loading $> .30$ on more than one factor will be excluded if the difference between the higher and the lower loading is < 0.25 .

It was therefore decided to first extract two factors by means of principal factor analysis with direct oblimin rotation. The items were randomly grouped into parcel, and the sums of the parcelled items were used in the subsequent analyses. The resulting structure matrix is shown in Table 5.

Table 5: *Two Structure Matrix: Principal Factor Analysis (N = 417)*

| Servant-leadership item | Factor | |
|-------------------------|--------|--------|
| | 1 | 2 |
| SL1 | 0.776 | 0.321 |
| SL2 | 0.768 | 0.126 |
| SL3 | 0.867 | -0.986 |
| SL4 | 0.839 | -0.107 |
| SL5 | 0.734 | 0.126 |
| SL6 | 0.828 | 0.240 |
| SL7 | 0.881 | 0.133 |
| SL8 | 0.779 | 0.549 |
| SL9 | 0.894 | 0.002 |
| SL10 | 0.795 | 0.154 |
| SL11 | 0.859 | 0.291 |
| SL12 | 0.800 | 0.628 |
| SL13 | 0.754 | 0.585 |
| SL14 | 0.889 | 0.287 |
| SL15 | 0.850 | 0.197 |
| SL16 | 0.849 | 0.406 |
| SL17 | 0.824 | 0.547 |
| SL18 | 0.883 | 0.282 |
| SL19 | 0.869 | 0.146 |
| SL20 | 0.856 | 0.259 |
| SL21 | 0.879 | 0.425 |
| SL22 | 0.875 | 0.108 |
| SL23 | 0.911 | 0.160 |

Note. Extraction method: Principal axis factoring. Rotation method: Oblimin with Kaiser normalization.

The two factors together explained 76.91% of the total variance, with factor 1 and factor 2 respectively explaining 71.67% and 5.24%. Of the common variance, the two factors respectively explained 93.19% and 6.81%. Not one of the items had its highest loading on the second factor. On the other hand, all the items loaded $>.70$ on the first factor. It was therefore decided to extract only one factor by means of principal factor analysis. A scree plot indicated that a one-factor structure could possibly be the most acceptable solution. Parcelling was done as described before. The result of extracting only one factor is shown in Table 6. All the items now loaded $>.70$ on the one factor extracted. This factor explained 71.67% of the total variance. The scale had a very high Cronbach alpha of .981.

Table 6: *SLQ: One Factor Structure (Principal Factor Analysis)*

| SL item | Factor 1 | SL item | Factor 1 |
|---------|----------|---------|----------|
| SL1 | 0.784 | SL13 | 0.773 |
| SL2 | 0.763 | SL14 | 0.894 |
| SL3 | 0.841 | SL15 | 0.849 |
| SL4 | 0.811 | SL16 | 0.860 |
| SL5 | 0.733 | SL17 | 0.841 |
| SL6 | 0.830 | SL18 | 0.887 |
| SL7 | 0.875 | SL19 | 0.863 |
| SL8 | 0.796 | SL20 | 0.859 |
| SL9 | 0.875 | SL21 | 0.891 |
| SL10 | 0.792 | SL22 | 0.866 |
| SL11 | 0.864 | SL23 | 0.906 |
| SL12 | 0.819 | | |

Note. Extraction method: Principal axis factoring.

Barbuto and Wheeler (2006) used principal components as the method of extraction of factors from the responses of the members of their sample. It was therefore decided at this stage to replace principal factor analysis and direct oblimin rotation by principal components with varimax rotation. Specifying this extraction rendered two eigenvalues > 1.00 (16.49 and 1.205), representing respectively 71.67% and 5.24% of the total variance and 93.19% and 6.81% of the common variance (see Table 7). It was decided not to pursue a possible two-factor solution any further; the large number of cross loadings made it seem likely that only one factor was present. A one-factor solution was specified and rendered the factor loadings shown in Table 8. All the items loaded on the single factor, with the lowest loading being .747 and the highest .908. This seems to be a pattern very similar to the result of a one-factor extraction using principal factor analysis, as shown in Table 6. Confirmatory factor analysis was carried out on the one-factor solution obtained from the principal factor analysis in order to determine how well this factor structure fit the data. These results are depicted in Table 9.

Table 7: *SLQ: Two Components Structure*

| SL item | Component | |
|---------|-----------|-------|
| | 1 | 2 |
| SL1 | 0.514 | 0.620 |
| SL2 | 0.675 | 0.410 |
| SL3 | 0.878 | 0.290 |
| SL4 | 0.877 | 0.251 |
| SL5 | 0.623 | 0.424 |
| SL6 | 0.634 | 0.549 |
| SL7 | 0.756 | 0.474 |
| SL8 | 0.354 | 0.815 |
| SL9 | 0.834 | 0.377 |
| SL10 | 0.675 | 0.449 |
| SL11 | 0.622 | 0.610 |
| SL12 | 0.339 | 0.864 |
| SL13 | 0.295 | 0.848 |
| SL14 | 0.655 | 0.612 |
| SL15 | 0.686 | 0.517 |
| SL16 | 0.528 | 0.710 |
| SL17 | 0.410 | 0.816 |
| SL18 | 0.653 | 0.606 |
| SL19 | 0.738 | 0.478 |
| SL20 | 9.645 | 0.577 |
| SL21 | 0.547 | 0.729 |
| SL22 | 0.767 | 0.450 |
| SL23 | 0.759 | 0.513 |

Note. Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization.

Table 8: *SLQ: One Factor Structure (Principal Factor Analysis)*

| SL item | Component 1 | SL item | Component 1 |
|---------|-------------|---------|-------------|
| SL23 | 0.908 | SL17 | 0.847 |
| SL14 | 0.897 | SL3 | 0.848 |
| SL21 | 0.894 | SL6 | 0.839 |
| SL18 | 0.891 | SL12 | 0.828 |
| SL9 | 0.880 | SL4 | 0.821 |
| SL7 | 0.879 | SL8 | 0.807 |
| SL22 | 0.872 | SL10 | 0.803 |
| SL11 | 0.870 | SL1 | 0.796 |
| SL19 | 0.869 | SL13 | 0.785 |
| SL16 | 0.867 | SL2 | 0.776 |
| SL20 | 0.865 | SL5 | 0.747 |
| SL15 | 0.856 | | |

Note. Extraction method: Principal component analysis.

Table 9: *Fit Indices: One Factor (N = 417)*

| Fit Indices |
|---|
| Degrees of freedom = 5 |
| Minimum fit function Chi-square = 27.74 ($p = 0.00$) |
| Normal theory weighted least square Chi-square = 26.69 ($p = 0.00$) |
| Satorra-Bentler scaled Chi-square = 19.60 ($p = 0.00$) |
| Chi-square corrected for nonnormality = 19.70 ($p = 0.00$) |
| Estimated noncentrality parameter (NCP) = 14.60 |
| 90% confidence interval for NCP = (4.58; 32.16) |
| Minimum fit function value = 0.067 |
| Population discrepancy function value (FO) = 0.035 |
| 90% confidence interval for FO = (0.011; 0.077) |
| Root mean square error for approximation (RMSEA) = 0.084 |
| 90% confidence interval for RMSEA = (0.047; 0.12) |
| P -value for Test of close fit (RMSEA < 0.05) = 0.64 |
| Expected cross-validation index (ECVI) = 0.095 |
| 90% confidence interval for ECVI = (0.071; 0.14) |

| Fit Indices |
|--|
| ECVI for saturated model = 0.072 |
| ECVI for independence model = 8.55 |
| Chi-square for independence model with 10 df = 3546.84 |
| Independence AIC = 3556.84 |
| Model AIC = 39.60 |
| Saturated AIC = 30.00 |
| Independence CAIC = 3582.01 |
| Model CAIC = 89.93 |
| Saturated CAIC = 105.50 |
| Normed fit index (NFI) = 0.99 |
| Nonnormed fit index (NNFI) = 0.99 |
| Parsimony normed fit index (PNFI) = 0.50 |
| Comparative fit index (CFI) = 0.99 |
| Incremental fit index (IFI) = 0.99 |
| Relative fit index (RFI) = 0.98 |
| Critical N (CN) = 227.27 |
| Root mean square residual (RMR) = 0.27 |
| Standardized RMR = 0.0054 |
| Goodness of fit index (GFI) = 0.97 |
| Adjusted goodness of fit index (AGFI) = 0.92 |
| Parsimony goodness of fit index (PGFI) = 0.32 |

The indices shown in Table 9 seem to indicate an acceptable fit with the data. The SRMR had a value of .0054, well below the level of .05 which indicates a good fit. The value of RMSEA was .084, which is lower than the level of .10 which indicates an acceptable fit. The upper level of the 90% range for the value of RMSEA was, however, at .12; higher than .10. The value of the normed chi-square index was 5.5, higher than the value of 5.0 that is sometimes set as an upper level for a good fit. This should, however, be seen in the context of the difficulties associated with the interpretation of the value of chi-square when $N > 200$, as is the case in the present study. The incremental fit indices are mostly above .90. The goodness of fit and the adjusted goodness of fit indices are both above .90.

When the values of the indices in Tables 3 and 9 are compared, the one-factor structure found in the present study seems to represent a somewhat better fit with the data than the five-factor solution accepted by Barbuto and Wheeler (2006). The values of RMSEA, SRMR, ECVI, model AIC, CAIC, NCP, and SNCP are all lower in the one-factor solution; and the incremental fit indices are higher than in the five-factor solution.

To determine the stability of the findings with regard to the factorial structure of the SLQ, an internal cross-validation procedure was employed as a second (different) sample was not

available. For the purposes of the cross-validation, the present sample was randomly divided into two subsamples. Confirmatory factor analysis was carried out on the responses of the two subsamples treated as independent samples (see Table 10). The one-factor structure seems to fit the responses of both subsamples satisfactorily. The value of RMSEA (.10) for subsample 2, however, seems to indicate an only marginally acceptable fit with the data. The values obtained for the different forms of chi-square are all higher for subsample 2 than for subsample 1.

Table 10: *Fit Indices Obtained From CFA on SLQ Responses ($N_1 = 208$, $N_2 = 209$)*

| | Random Sample 1 | Random Sample 2 |
|--|-----------------------|------------------------|
| Degrees of freedom | 5 | 5 |
| Minimum fit function Chi-square | 13.91 ($p = 0.016$) | 18.24 ($p = 0.0027$) |
| Normal theory weighted least square Chi-square | 14.12 ($p = 0.015$) | 17.86 ($p = 0.0031$) |
| Satorra-Bentler scaled Chi-square | 11.09 ($p = 0.050$) | 16.09 ($p = 0.0066$) |
| Chi-square corrected for nonnormality | 11.43 ($p = 0.043$) | 16.22 ($p = 0.0062$) |
| Estimated noncentrality parameter (NCP) | 6.09 | 11.09 |
| 90% confidence interval for NCP | 0.0068; 1980 | 2.55; 27.21 |
| Minimum fit function value | 0.067 | 0.088 |
| Population discrepancy function value (FO) | 0.029 | 0.053 |
| 90% confidence interval for FO | 0.00; 0.096 | 0.012; 0.13 |
| Root mean square error for approximation (RMSEA) | 0.077 | 0.10 |
| 90% confidence interval for RMSEA | 0.0026; 0.14 | 0.049; 0.16 |
| P -value for Test of close fit (RMSEA < 0.05) | 0.19 | 0.051 |
| Expected cross-validation index (ECVI) | 0.15 | 0.17 |
| 90% confidence interval for ECVI | 0.12; 0.22 | 0.13; 0.25 |
| ECVI for saturated model | 0.14 | 0.14 |
| ECVI for independence model | 8.75 | 8.22 |
| Chi-square for independence model with 10 df | 1801.07 | 1700.59 |
| Independence AIC | 1811.07 | 1710.69 |
| Model AIC | 31.09 | 36.00 |
| Saturated AIC | 30.00 | 30.00 |
| Independence CAIC | 1832.76 | 1732.76 |
| Model CAIC | 74.46 | 79.52 |
| Saturated CAIC | 95.06 | 95.14 |

| | Random Sample 1 | Random Sample 2 |
|--|-----------------|-----------------|
| Normed fit index (NFI) | 0.99 | 0.99 |
| Nonnormed fit index (NNFI) | 0.99 | 0.98 |
| Parsimony normed fit index (PNFI) | 0.50 | 0.49 |
| Comparative fit index (CFI) | 1.00 | 0.99 |
| Incremental fit index (IFI) | 1.00 | 0.99 |
| Relative fit index (RFI) | 0.98 | 0.98 |
| Critical N (CN) | 225.59 | 173.02 |
| Root mean square residual (RMR) | 0.26 | 0.42 |
| Standardized RMR | 0.0046 | 0.0085 |
| Goodness of fit index (GFI) | 0.97 | 0.97 |
| Adjusted goodness of fit index (AGFI) | 0.92 | 0.90 |
| Parsimony goodness of fit index (PGFI) | 0.32 | 0.32 |

As a next step in the cross-validation procedure, the two subsamples were treated as independent samples. It was specified that in the confirmatory factor analysis to be carried out, all the parameters were first constrained and then unconstrained (see Table 11). These analyses were followed by calculation of the indices in Table 12 to determine whether differences exist when all the parameters were constrained (H_o) compared to when all the parameters could vary freely (H_a). From Table 12, it can be seen that the null hypothesis should be rejected. There seems to be a significant difference between the fit of the responses of the two samples to the instrument configured as a unidimensional measure.

Table 11: *Fit Indices Obtained From CFA (Independent Samples: Constrained/Unconstrained)*

| Global goodness of fit statistics | | |
|--|--------------------------------------|--|
| | All parameters constrained (H_o) | No constraints on parameters (H_a) |
| Degrees of freedom | 20 | 12 |
| Minimum fit function Chi-square | 79.66 ($p = 0.00$) | 67.12 ($p = 0.00$) |
| Normal theory weighted least square Chi-square | 81.79 ($p = 0.00$) | 64.26 ($p = 0.00$) |
| Satorra-Bentler scaled Chi-square | 93.46 ($p = 0.00$) | 68.44 ($p = 0.00$) |
| Chi-square corrected for nonnormality | 150.21 ($p = 0.00$) | 88.06 ($p = 0.00$) |
| Estimated noncentrality parameter (NCP) | 73.46 | 56.44 |
| 90% confidence interval for NCP | 47.09; 107.36 | 34.10; 86.29 |

| Global goodness of fit statistics | | |
|--|---|---|
| | All parameters constrained (H_o) | No constraints on parameters (H_a) |
| Minimum fit function value | 0.19 | 0.16 |
| Population discrepancy function value (FO) | 0.18 | 0.14 |
| 90% confidence interval for FO | 0.11; 0.26 | 0.082; 0.21 |
| Root mean square error for approximation (RMSEA) | 0.13 | 0.15 |
| 90% confidence interval for RMSEA | 0.11; 0.16 | 0.12; 0.19 |
| <i>P</i> -value for Test of close fit (RMSEA < 0.05) | 0.0037 | 0.0033 |
| Expected cross-validation index (ECVI) | 0.27 | 0.25 |
| 90% confidence interval for ECVI | 0.21; 0.36 | 0.20; 0.32 |
| ECVI for saturated model | 0.072 | 0.072 |
| ECVI for independence model | 8.46 | 8.46 |
| Chi-square for independence model with 10 <i>df</i> | 3501.66 | 3501.66 |
| Independence AIC | 3521.66 | 3521.66 |
| Model AIC | 113.46 | 104.44 |
| Saturated AIC | 60.00 | 60.00 |
| Independence CAIC | 3571.99 | 3571.99 |
| Model CAIC | 163.79 | 195.03 |
| Saturated CAIC | 210.99 | 210.99 |
| Normed fit index (NFI) | 0.98 | 0.98 |
| Nonnormed fit index (NNFI) | 0.98 | 0.97 |
| Parsimony normed fit index (PNFI) | 0.98 | 0.59 |
| Comparative fit index (CFI) | 0.98 | 0.98 |
| Incremental fit index (IFI) | 0.98 | 0.98 |
| Relative fit index (RFI) | 0.98 | 0.97 |
| Critical N (CN) | 196.70 | 163.10 |
| Group goodness of fit statistics | | |
| Contribution to Chi-square | 36.42 | 33.49 |
| % Contribution to Chi-square | 45.72 | 49.89 |
| Root mean square residual (RMR) | 1.11 | 3.08 |
| Standardized RMR | 0.021 | 0.056 |
| Goodness of fit index (GFI) | 0.93 | 0.94 |

Table 12: *Comparisons of Chi-Square Values when Variances are Constrained/Not Constrained*

| Servant Leadership: Random Sample 1 and Random Sample 2 simultaneously | | |
|--|---|---|
| | All parameters constrained (H_o) | No constraints on parameters (H_a) |
| Chi square | 93.46 | 68.44 |
| <i>Df</i> | 20.00 | 12.00 |
| RMSEA | 0.13 | 0.15 |
| NFI | 0.98 | 0.98 |
| CFI | 0.98 | 0.98 |
| Difference in Chi square $H_o - H_a$ | 25.02 | |
| Critical value Chi square (8; 0.05) | 15.51 | |
| Significant | Yes | |

Discussion

In the validation process of the SLQ, Barbuto and Wheeler (2006) identified a factor structure consisting of five dimensions after creating items in terms of a formulation of the contents of servant leadership by Spears (1995) and additional elements identified by them. Barbuto and Wheeler performed exploratory and confirmatory factor analyses to determine the factor structure of the instrument. The confirmatory factor analysis results indicated that a good fit existed between the factor structure and the data. The factors in the rater version of the resulting SLQ were highly related to each other. The respondents in the validation process consisted of 388 colleagues of 80 elected community leaders who completed the rater version of the instrument.

In the present study, 417 sales persons rated the servant leadership behavior of their immediate managers. When the original structure was subjected to confirmatory factor analysis, the results indicated an adequate but not good fit between the measurement model and the data. Further investigation of the responses, through item analysis as well as explanatory factor analysis, made it clear that the 23 items all correlated very highly with each other. Exploratory factor analysis, both with principal extraction and direct oblimin rotation and principal components extraction with varimax rotation, yielded two eigen values > 1.00 . Further investigation, however, indicated that it would be sensible to extract only one factor. Specifying one factor indicated (with both principal axes and principal components extraction) that the 23 items all loaded highly on one factor. Confirmatory factor analysis yielded indices that reflected a good fit between the unidimensional measurement model and the data. The indices all indicated a better fit with the data by a one-factor structure than a five-factor one. An internal cross-validation procedure indicated that the one-factor structure did not fit the responses of two randomly divided subsamples equally well.

The results are not fully understood. It should be remembered that the two samples probably differed not only in terms of the cultures and countries of origin but also in the kind of work and the organizations in which the members engaged. The unidimensionality of the questionnaire, when applied to the present sample, could possibly be due to a response set in the reaction to the items. This might have been aggravated by social desirability responses as the participants had to assess the servant leader behavior of their immediate superiors (sales managers). The SLQ has not been examined regarding its susceptibility to social desirable responding. In the present study, the participants possibly saw the behavior of their managers in unitary terms (i.e., they responded to a general picture of their superior).

The results of the present study seem to indicate that the SLQ, in a structural sense, has some portability to the sample used. The internal reliability of the unidimensional scale is very high. When the five-factor structure is inspected, it is clear that the high intercorrelations among the items resulted in high internal reliability of the subscales, as identified by Barbuto and Wheeler (2006).

The present study was carried out on a rather homogenous sample. Though work locations were spread out over South Africa and subjected to different marketing approaches and strategies of different motor manufacturers; the respondents did the same kind of work, within the same industry, in the same country. Future studies should probably be done on more heterogeneous samples in terms of work demands, products, marketing strategies, and procedures from different industries. It will probably be necessary to investigate effects of the social desirability on the responses to the questionnaire.

The study seems to have contributed some understanding of the construct servant leadership in the South African culture. What is clear is that the construct servant leadership remains intact. When applied to the South African sample, however, it is not as multidimensional as is the case when it is applied to a U.S. sample. Currently, further analysis of the responses of the participants in the present study is being undertaken regarding the predictive validity of the instrument and the redundancy or nonredundancy of the servant leadership construct.

About the Authors

Dr. Zani Dannhauser is a registered industrial and organization (I/O) psychologist, master HR practitioner, and trained assessor. Her academic career commenced in 1998. She has worked as an academic at various universities in South Africa, including the University of South Africa (UNISA) and the University of Johannesburg (previously RAU). Since January 2003 she has been appointed in both a lecturing and researching capacity at the University of Stellenbosch. She also spent a substantial time working in the private sector as a professional I/O psychologist, mainly within the financial, medical-legal, educational, automotive, and consulting industries—in both a professional and psychologist capacity. Dr. Dannhauser still consults for different organizations across various industries. She completed her doctorate on positive organizational behavior, focusing primarily on the domain specificity of servant leadership and its effects on teamwork. Her research interests include servant leadership, teamwork, and organizational behavior.

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