

Assessing the psychometric properties of the revised and abbreviated self-leadership questionnaires

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Orientation: Self-leadership is considered to be vital for improved performance in the South African working context. Limited research has been done on the psychometric properties of the revised and abbreviated self-leadership questionnaires on a sample of working adults.

Research purpose: The aim of this study was to assess the psychometric properties of the revised (RSLQ) and abbreviated (ASLQ) versions of the Self-Leadership Questionnaire for a sample of working adults in South Africa.

Motivation for the study: Researchers have not previously published psychometric properties of the RSLQ and ASLQ using the original conceptualisation and based on a sample from the South African working context.

Research design, approach and method: The RSLQ and ASLQ were administered to a non-probability sample of 405 working adults in South Africa. Confirmatory factor analysis was employed to estimate the goodness-of-fit associated with competing conceptualisations of both versions.

Main findings: The authors found acceptable goodness-of-fit for both the RSLQ and ASLQ. More specifically, both the composite (representing self-leadership) and calculated scores (representing subscales of self-leadership) indicated acceptable levels of reliability. However, the RSLQ is best conceptualised as consisting of a strong general factor.

Practical/managerial implications: The study found that both the RSLQ and the ASLQ have good measurement properties, indicating that these questionnaires can be applied in a variety of settings.

Contribution/value-add: Research has indicated the value of investigating the psychometric properties of the RSLQ and ASLQ for a sample of employees in the South African working context. In this study, a bifactor model provided evidence that the RSLQ consists of a strong general factor (i.e. self-leadership). The ASLQ also seems to measure a single dimension that is very reliable. Utilising the ASLQ will save time in research and also when applied in the working context.

Introduction

Orientation

According to Houghton, Dawley and DiLiello (2012), in these present times of economic uncertainty and fierce competition, many firms are shifting away from a traditional top-heavy leadership paradigm to embrace a new model of leadership that involves empowering employees at all organisational levels to greater responsibility for their own work-related behaviours and actions (Houghton *et al.*, 2012).

Ugurluoglu, Saygili, Ozer and Santas (2013) are of the opinion that, under today's conditions, the most appropriate leader is the self-leader who also leads others towards self-leadership. Self-leadership (the process of influencing oneself to perform more effectively) has attracted a significant amount of attention over the past two decades (Neck & Houghton, 2006), as is evident in the dozens of academic articles written on this issue during this period (e.g. Alves, Lovelace, Manz & Matsypura, 2006; D'Intino, Goldsby, Houghton & Neck, 2007; Dion, 2012; Dolbier, Soderstrom & Steinhardt, 2001; Hauschildt & Konradt, 2012; Ho & Nesbit, 2013; Javadi, Rezaee & Salehzadeh, 2013; Malmir & Azzizadeh, 2013; Manz & Neck, 1999; Neck & Houghton, 2006; Norris, 2008; Prussia, Anderson & Manz, 1998; Sahin, 2008; Segon, 2011; Turkoz, Mutlu, Tabak & Erdogan, 2013; Van Zyl, 2008, 2012).

Houghton *et al.* (2012) indicate that, initially, most academic articles on self-leadership focused on conceptual research. Since the publication of the Revised Self-Leadership Questionnaire

(RSLQ; Houghton & Neck, 2002), however, more empirical studies have been conducted (e.g. Sahin, 2008; Ugurluoglu *et al.*, 2013). Most of these studies were conducted in the USA, Europe and Asia, whilst only a single study by Mahembe, Engelbrecht and De Kock (2013) was conducted in South Africa. This study was applied to young adults studying full time at a South African university, not to working adults. It is, therefore, questionable whether the second-order structure that Mahembe *et al.* (2013) provided in their research would be replicable on a sample of working adults in the South African working context. Furthermore, the application of confirmatory factor analysis on the second-order factors of the RSLQ could confirm the construct validity of the RSLQ, specifically for research participants in a South African working context (Mahembe *et al.*, 2013).

Another relevant study, by Houghton *et al.* (2012), focused on the development and validation of a nine-item abbreviated version (ASLQ) of the 35-item RSLQ. The applicability of this version, however, has not been tested on a South African working population before.

Purpose

The current study focuses on the assessment of the psychometric properties of the revised (RSLQ) and abbreviated (ASLQ) versions of the Self-Leadership Questionnaire for a working population in South Africa. Self-leadership should have a wider socio-economic relevance in developing countries such as South Africa, because it is a competency that could prove critical in transformation on an individual, group, organisational and societal level (Mahembe *et al.*, 2013). Yet, not much South African-related research on self-leadership (especially regarding its measurement within the working context) has been done (Van Zyl, 2009). Furthermore, no research focusing on the applicability of the ASLQ within any South African context has been done previously. Against this background, the primary research aim of this study was to assess the psychometric properties of the RSLQ and ASLQ for a sample of working adults.

More specifically, the following will be evaluated (based on a working population in the South African context):

- The goodness-of-fit associated with the various conceptualisations of the RSLQ (35 items) using a sample of working adults.
- The degree to which the RSLQ consists of a strong general factor, using a sample of working adults.
- The goodness-of-fit associated with the various conceptualisations of the ASLQ (nine items) using a sample of working adults.

Contribution to the field

This study will contribute by closing the gap in research on the psychometric properties of the RSLQ for a sample of South African working adults. In addition, the presence of a

strong general factor has previously been investigated using a higher-order factor structure. However, the current study will employ a bifactor model, which is a more appropriate approach to determine the presence of a strong general factor. Furthermore, a need has been identified for research on the psychometric properties of the ASLQ for a similar sample (South African working adults), because the shorter version will save time when researchers want to assess self-leadership as part of a more extensive study including other variables.

Both these instruments can help to identify individuals with poor self-leadership skills in the South African working context. By doing so, support can be provided to such individuals to improve their self-influencing (self-leadership) skills which, in turn, could help them to perform more effectively.

Literature review

Self-leadership: Conceptual overview

Self-leadership is a process of behavioural and cognitive self-evaluation and self-influence by which people achieve the self-direction and self-motivation needed to shape their behaviours in positive ways in order to enhance their overall performance (Houghton *et al.*, 2012, p. 217). More specifically, self-leadership involves strategies and normative actions that will help to enhance performance (Houghton *et al.*, 2012; Ugurluoglu *et al.*, 2013). Self-leadership strategies and actions are usually divided into behaviour-focused strategies, natural reward strategies and constructive thought strategies (Norris, 2008).

Behaviour-focused self-leadership strategies pertain to self-observation, goal setting, self-reward, self-punishment and cues (Neck & Houghton, 2006). Self-observation refers to individuals' awareness of how, when and why they engage in specific behaviours (D'Intino *et al.*, 2007). According to Ugurluoglu *et al.* (2013), self-observation entails that people escalate their awareness of why and when they display certain behaviours. Such awareness could help people to overcome the display of effective but unproductive behaviour (Ugurluoglu *et al.*, 2013). With accurate information regarding current behaviour and performance levels, individuals can more successfully set effective behaviour-altering goals for themselves (Manz & Neck, 2004). Rewards set by an individual, along with self-set goals, can aid significantly in energising the efforts necessary to accomplish the goals (D'Intino *et al.*, 2007). Self-rewards could be as simple as mentally praising oneself for a job well done or something more tangible, such as treating oneself to a new outfit or a night at the movies (Houghton *et al.*, 2012). Self-punishment is an additional strategy for the self-influence of behaviour. However, habitual self-punishment and guilt have, in general, received mixed to negative support as a self-leadership strategy (Stewart, Courtright & Manz, 2011). Finally, behavioural rehearsal (cues) prior to actual performance can promote refinement, improvement and corrective adjustments for greater individual effectiveness (Stewart *et al.*, 2011).

Natural reward strategies are designed to enhance the intrinsic motivation that is vital for performance (Mahembe *et al.*, 2013). These types of strategy help individuals to build pleasant and enjoyable features into their activities so that the tasks themselves become naturally rewarding (Norris, 2008). Houghton *et al.* (2012, p. 218) add that individuals can employ natural rewards also by shifting the cognitive focus to the intrinsically rewarding aspects of the job. Focusing on building pleasant and enjoyable features in work tasks will create feelings of intrinsic motivation (D'Intino *et al.*, 2007).

Constructive thought strategies involve visualising successful performance, engaging in positive self-talk and examining individuals' beliefs and assumptions in order to align cognitions with desired behaviour (Ho & Nesbit, 2013). Through a process of identifying and altering distorted beliefs, individuals can minimise dysfunctional thinking processes and engage in more rational and effective cognitive processes (Houghton *et al.*, 2012). Positive self-talk and evaluation of existing habits and ways of thinking (for instance, I am an opportunity thinker) can enhance constructive thought patterns (Van Zyl, 2008).

Assessment of self-leadership

Manz (1993) developed a set of initial items to capture elements of both self-management and self-leadership. Self-management (Manz, 1986; Stewart *et al.*, 2011) is conceptualised as strategies for getting oneself to complete difficult but necessary tasks and is assessed by scales capturing self-observation, cueing strategies, self-goal setting, self-reward, self-punishment and practice (Stewart *et al.*, 2011). In contrast, self-leadership is conceptualised as more intrinsically motivated and includes scales like building natural rewards into work, choosing pleasant surroundings, building naturally rewarding activities into work, focusing on pleasant aspects of work and focusing on natural rewards rather than on external rewards (meaning rewards outside the work itself; Manz & Simms, 1991; Neck, 1996; Stewart *et al.*, 2011, p. 191). Mahembe *et al.* (2013) indicated that, at about the same time, Cox (1993) developed and tested a 34-item unpublished Self-Leadership Questionnaire (SLQ), with eight factors, labelled as self-problem-solving initiative, self-efficacy, teamwork, self-reward, self-goal setting, natural rewards, opportunity thought and self-observation or evaluation (Mahembe *et al.*, 2013, p. 4).

Anderson and Prussia (1997) continued to work on the Manz scale and subjected it to content validation (Stewart *et al.*, 2011). Subject matter experts placed the original 90 items into three categories: behaviour-focused strategies, natural reward strategies and constructive thought strategies (Stewart *et al.*, 2011, p. 191). Houghton *et al.* (2012) indicated that the 50-item instrument of Anderson and Prussia is a first step in developing a self-leadership scale, but it was plagued by some inherent reliability and validity problems and, therefore, required additional refinement.

Houghton and Neck (2002) developed the RSLQ by eliminating or rewriting ineffective questions from Anderson and Prussia's (1997) SLQ and adding items from Cox's (1993) instrument (Houghton *et al.*, 2012). Houghton *et al.* (2012) argue that, although the RSLQ demonstrates reasonably good reliability and validity across a number of empirical studies (Houghton, Neck & Singh, 2004; Neck & Houghton, 2006), additional research is needed to further assess the reliability and validity of the RSLQ (Houghton *et al.*, 2012, p. 222). Houghton *et al.* developed and validated a nine-item abbreviated version (ASLQ) of the 35-item RSLQ. A confirmatory factor analysis indicated that the ASLQ is a reliable and valid measure that has inherited the nomological network of associations from the original version of the RSLQ (Houghton *et al.*, 2012, p. 216).

A South African study by Mahembe *et al.* (2013) focused on a confirmatory factor analytic study of the RSLQ. The findings indicated that the RSLQ demonstrated sufficient factorial or construct validity. The second-order measurement model confirmed that the eight self-leadership factors contributed to an overall self-leadership approach (Mahembe *et al.*, 2013). Although this research indicated strong psychometric properties, the sample of young adults studying at a South African university cannot be generalised to working adults in the South African context.

No South African study to date has attempted to investigate the psychometric properties of the ASLQ. It is therefore important to also investigate the psychometric properties of the ASLQ, because using the longer version (RSLQ) could pose a challenge to researchers when self-leadership is being examined together with other variables. It may however be applied on its own when trying to identify employees with poor self-leadership skills (in the workplace). Houghton *et al.* (2012, p. 222) put it as follows: 'overall survey length can quickly become unwieldy, leading to rater fatigue, inaccuracy and missing survey data'.

Method

Research approach

In order to execute the research, the current study followed a cross-sectional design with a survey data collection technique. More specifically, the current study investigated competing measurement models representing the three different conceptualisations as suggested by the developers of the RSLQ. The three competing measurement models were: (1) a hierarchical model of self-leadership, (2) a unidimensional model and (3) a three uncorrelated factors model of self-leadership. In addition, the current study investigated a fourth competing measurement model representing a bifactor structure. This latter model will provide more direct evidence as to whether or not the RSLQ measures a strong general factor (i.e. self-leadership).

A similar approach (i.e. competing measurement models) was followed to investigate the psychometric properties associated with two conceptualisations of the ASLQ: (1) a

three uncorrelated factors model of self-leadership and (2) a unidimensional structure associated with self-leadership.

Participants

A total of 405 working adults participated in the study. Women were in the majority (72%). Most of the participants came from a designated group (71%) and were in the age group of 26–35 years (81%). Most of the respondents were married (64%). Accidental sampling was used within different organisations in the financial services sector.

Measuring process

Permission for the research was granted by the research committee of the Faculty of Economic and Management Sciences and all relevant ethical issues were cleared. The participants were briefed about the aim of the study, their right to voluntary participation and the anonymity of the information they would provide. Participants received instructions on how to complete the RSLQ. They also completed a biographical questionnaire.

Measuring instruments

Self-leadership was measured using the RSLQ, which consists of 35 items. The questionnaire covers three dimensions (behaviour-focused strategies, natural reward strategies and constructive thought pattern strategies). The three dimensions have the following subscales:

- Behaviour-focused strategies: self-goal setting (five items), self-reward (three items), self-punishment (four items), self-observation (four items) and self-cueing (two items).
- Natural reward strategies: focusing thoughts on natural rewards (five items).
- Constructive thought pattern strategies: visualising successful performance (five items), self-talk (three items) and evaluating beliefs and assumptions (four items).

The ASLQ covers three dimensions, namely behaviour awareness and volition, task motivation and constructive cognition. The three dimensions have the following subscales:

- Behaviour awareness and volition: self-goal-setting (two items) and self-observation (one item).
- Task motivation: visualising successful performance (two items) and self-reward (one item).
- Constructive cognition: evaluating beliefs and assumptions (two items) and self-talk (one item).

Participants also completed a biographical questionnaire providing information related to age group, gender, home language and marital status.

Analysis

The current study employed LISREL 8.80 (2006) to estimate the goodness-of-fit of each of the competing measurement models associated with both the RSLQ and ASLQ. A test

of multivariate normality was performed to determine whether the data violated the assumption of normality. The results suggested that the data deviated from normality with regard to skewness and kurtosis. Hence, the robust maximum likelihood method of estimation was used to estimate the various models (Brown, 2006). Several fit indices were used as well, including the Satorra-Bentler scaled chi-square, root mean square error of approximation (RMSEA), standardised root mean square residual (SRMR), comparative fit index (CFI) and the goodness-of-fit index (GFI). Values close to 0.95 for GFI and CFI are considered indicative of good model fit. Hu and Bentler (1999) suggest that values close to 0.06 are indicative of acceptable fit for RMSEA, whilst values smaller than 0.08 are acceptable for SRMR. In addition, Akaike's information criterion (AIC) is used in the comparison of competing measurement models with smaller values representing a better fit of the proposed model (Byrne, 2006).

Cronbach's alpha (α) was used to estimate the reliability of the dimensions of the constructs being investigated in the current study. Reliability estimates of 0.7 and higher are indicative of good reliability. However, estimates as low as 0.6 may be acceptable when conducting exploratory research (Hair, Black, Babin, Anderson & Tatham, 2006, pp. 137, 778).

It should be noted that, in order to facilitate direct comparison with the results obtained by developers of the RSLQ, the current study used (1) the same indicators and (2) the same conceptualisations of the three competing measurement models (hierarchical model of self-leadership, one-factor model and three uncorrelated factors model). The current study used the same instructions to create item parcels (i.e. composite scores) for eight of nine subscales. In addition, the developers used the three items with the highest factor loadings (items 26, 32, 35) for the natural reward subscale (Houghton & Neck, 2002, p. 678).

Results

Revised Self-Leadership Questionnaire

From Table 1, it is clear that the three measurement models proposed by the developers of the RSLQ show different levels of fit with regard to CFI, RMSEA and SRMR. The three uncorrelated factors model has poor fit. In contrast, both the unidimensional and higher-order factor models exhibit acceptable levels of fit when looking at CFI, RMSEA and SRMR. The bifactor model also seems to fit the data well when considering the value of CFI. Together, both the unidimensional and bifactor model results may lend support to the possibility that the RSLQ measures a general construct (i.e. self-leadership).

The developers of the RSLQ concluded that the 'behaviour focused, natural rewards, and constructive thoughts factors have a higher-order factor; namely self-leadership' (Houghton & Neck, 2002, pp. 679, 681, 685). Mahembe *et al.* (2013, p. 3) claim that the higher-order factor model

TABLE 1: Goodness-of-fit statistics for the competing measurement models (RSLQ, $n = 405$).

Goodness-of-fit statistics	Unidimensional model	Higher-order factor model	Three uncorrelated factors model	Bifactor model
Satorra-Bentler scaled chi-square	107.230	104.290	426.470	1668.250
Degrees of freedom	44.000	41.000	44.000	529.000
Comparative fit index	0.990	0.990	0.940	0.980
Root mean square error of approximation	0.060 (0.045; 0.074)	0.062 (0.047; 0.077)	0.150 (0.130; 0.160)	0.073 (0.069; 0.079)
Standardised root mean square residual	0.039	0.040	0.410	0.170
Akaike's information criterion	151.230	154.290	470.470	1870.250

could provide evidence that the RSLQ consists of a strong global or general factor. However, this model is not the only or most suitable conceptualisation in determining the presence of a strong general factor. This second-order model states that the target trait (self-leadership) is a second-order dimension that explains why the three primary dimensions (behaviour-focused strategies, natural reward strategies and constructive thought pattern strategies) are correlated. Unfortunately, there is no direct relationship between the item and the target trait (self-leadership), but the relationship between self-leadership and each item or parcel is mediated by the primary factor. Hence, it models an indirect effect. A more suitable approach to determine the presence of a strong general factor is using a bifactor model (Chen, West & Sousa, 2006; Reise, 2012; Reise, Moore & Haviland, 2010). The latter model allows researchers to determine directly the degree to which items reflect a common trait (e.g. self-leadership) and the degree to which they reflect subtraits (i.e. sub-dimensions of the RSLQ; Reise *et al.*, 2010, p. 546).

Table 2 shows that the majority of items have higher loadings on the general factor than on the group factors (i.e. dimensions of the RSLQ). This is indicative of a strong general factor (Reise *et al.*, 2010). As per the suggestion of Reise *et al.* (2010), an omega hierarchical reliability coefficient of the general factor of the bifactor model was also obtained, namely 0.90.

The reliability estimates associated with each of the three dimensions of the RLSQ are reported in Table 3. It is clear that all the dimensions have acceptable reliabilities that exceed 0.70.

Table 4 provides the reliability estimates associated with each of the eight subscales of the RSLQ. It is evident that both the self-cueing and self-goal setting subscales are the most reliable subscales of the RSLQ.

Abbreviated Self-Leadership Questionnaire

According to Table 5, the unidimensional model of the ASLQ is the better fitting model as evident from the small value of AIC. In addition, all the fit indices associated with this model (CFI, RMSEA and SRMR) are indicative of an acceptable fit. In contrast, the three uncorrelated factors model does not fit the data well.

It is clear from Table 6 that all three the dimensions associated with the ASLQ have acceptable estimates of reliability that exceed 0.70. The behaviour awareness and volition dimension seem to be the most reliable of the three.

TABLE 2: Standardised factor loadings for the bifactor model (RSLQ, $n = 405$).

Item	General factor	Behaviour-focused strategies	Natural reward strategies	Constructive thought pattern strategies
1	0.33	-	-	0.67
2	0.63	0.63	-	-
3	0.60	-	-	0.29
4	0.45	0.17	-	-
5	0.63	-	-	0.35
6	0.51	0.24	-	-
7	0.81	0.08	-	-
8	0.79	-	0.91	-
9	0.68	0.67	-	-
10	0.70	-	-	0.60
11	0.83	0.06	-	-
12	0.65	-	-	0.12
13	0.60	0.39	-	-
14	0.77	-	-	0.11
15	0.43	-0.12	-	-
16	0.48	-0.23	-	-
17	0.69	-	-0.02	-
18	0.71	0.64	-	-
19	0.72	-	-	0.54
20	0.83	0.22	-	-
21	0.32	-	-	-0.04
22	0.57	0.15	-	-
23	0.77	-	-	0.13
24	0.18	-0.57	-	-
25	0.83	-0.02	-	-
26	0.66	-	0.01	-
27	0.83	-	-	0.31
28	0.84	-0.05	-	-
29	0.85	-	-	0.15
30	0.52	-0.30	-	-
31	0.85	0.09	-	-
32	0.81	-	-0.03	-
33	0.82	-	-	0.14
34	0.83	0.36	-	-
35	0.64	-	0.00	-

TABLE 3: Reliability estimates for the three dimensions (RSLQ, $n = 405$).

Dimension	Number of items	Alpha
Behaviour-focused strategies	18	0.923
Natural reward strategies	5	0.798
Constructive thought pattern strategies	12	0.910

Discussion

Outline of the results

Psychometric properties of the Revised Self-Leadership Questionnaire

When comparing the goodness-of-fit statistics obtained in the current study with those reported by Houghton and Neck

TABLE 4: Reliability estimates for the nine subscales (RSLQ, $n = 405$).

Subscale	Number of items	Alpha
Self-goal setting	5	0.905
Self-reward	3	0.774
Self-punishment	4	0.714
Self-observation	4	0.829
Self-cueing	2	0.908
Focusing thoughts on natural rewards	5	0.798
Visualising successful performance	5	0.864
Self-talk	3	0.710
Evaluating beliefs and assumptions	4	0.865

TABLE 5: Goodness-of-fit statistics for the competing measurement models (ASLQ, $n = 405$).

Goodness-of-fit statistics	Unidimensional model	Three uncorrelated factors model
Satorra-Bentler scaled chi-square	86.950	305.800
Degrees of freedom	27.000	27.000
Comparative fit index	0.990	0.930
Root mean square error of approximation	0.074 (0.057; 0.092)	0.160 (0.140; 0.180)
Standardised root mean square residual	0.048	0.400
Akaike's information criterion	122.950	341.800

TABLE 6: Reliability estimates for the three dimensions (ASLQ, $n = 405$).

Dimension	Number of items	Alpha
Behaviour awareness and volition	3	0.852
Task motivation	3	0.707
Constructive cognition	3	0.777

(2002), the results are encouraging. Houghton and Neck found that the unidimensional model did not fit the data well. However, the current study found that the unidimensional model did fit the data well. Where the developers concluded that the higher-order factor model was the best fitting model, the current study found that both the unidimensional and higher-order models were the best fitting when using the conceptualisations suggested by the developers. Both these results may suggest that the RSLQ measures a strong general factor (i.e. self-leadership). However, only the bifactor model results would be able to support this assumption.

The reliability estimates reported by the developers are fairly similar or higher than those obtained by the current study with regard to the following six subscales: self-goal setting (0.84 vs 0.91), self-observation (0.82 vs 0.82), self-cueing (0.91 vs 0.91), focusing thoughts on natural rewards (0.74 vs 0.80), evaluating beliefs and assumptions (0.78 vs 0.87) and visualising successful performance (0.85 vs 0.86). However, the current study obtained lower reliabilities with regard to the following three remaining subscales: self-reward (0.93 vs 0.77), self-punishment (0.86 vs 0.71) and self-talk (0.92 vs 0.71).

A recent South African study reported on the psychometric properties of the RSLQ within a sample of young adults (Mahembe *et al.*, 2013). They tested a higher-order factor model consisting of the eight subscales. The results obtained by the current study seem to be fairly similar to those reported by Mahembe *et al.* (2013). Specifically, the values of CFI are

almost exactly the same for both the three uncorrelated factors model (0.99 vs 0.98) and the higher-order factor model (0.99 vs 0.98). In contrast, the values obtained in the current study are slightly higher (but still acceptable) with regard to the RMSEA in both the three-factor model (0.04 vs 0.07) and the higher-order factor model (0.04 vs 0.07).

The reliability estimates reported by Mahembe *et al.* (2013) are fairly similar or lower than those obtained by the current study with regard to the following six subscales: self-goal setting (0.84 vs 0.91), self-observation (0.82 vs 0.82), self-cueing (0.82 vs 0.91), focusing thoughts on natural rewards (0.74 vs 0.80), evaluating beliefs and assumptions (0.76 vs 0.87) and visualising successful performance (0.82 vs 0.86). However, the current study obtained lower reliabilities with regard to the following two remaining subscales: self-reward (0.90 vs 0.77) and self-talk (0.87 vs 0.71). Unfortunately, Mahembe *et al.* did not include the self-punishment subscale in their study.

In short, the psychometric properties of the RSLQ seem to suggest an instrument that is best conceptualised as measuring a single factor that is also very reliable.

Presence of a strong general factor: Although the results of the current study point to a well-fitting single factor model for self-leadership when using the RSLQ, this is not sufficient to claim that this instrument measures a strong general factor. In order to determine the presence of a strong general factor, the current study also employed a bifactor model to investigate this possibility. In contrast to the approach followed by Mahembe *et al.* (2013), the bifactor model is a more suitable conceptualisation to investigate the presence of a strong general factor. The current study indeed found evidence of a strong general factor. However, where Mahembe *et al.* tested a higher-order factor structure with the eight subscales (instead of the nine subscales available), both the developers and the current study used the three dimensions associated with the RSLQ. The current study therefore concludes that, when using the RSLQ, it is better to use a single composite score representing self-leadership. However, given the high value associated with omega hierarchical, the group factors (i.e. the dimensions of the RSLQ) do not seem to have any psychometric value. They do not contribute any additional variance already accounted for by the general factor. Hence, the use of subscores representing the dimensions associated with the RSLQ may be overly optimistic.

Psychometric properties of the Abbreviated Self-Leadership Questionnaire

The current study found that the one-factor model, associated with the ASLQ, fitted the data well. As was evident from the results reported for the RSLQ, the three uncorrelated factors model also did not seem to be a good representation of the ASLQ. In contrast, Houghton *et al.* (2012) found acceptable levels of fit associated with the three uncorrelated factors model.

The developers of the ASLQ reported a reliability estimate for the total scale (α) of 0.73 (Houghton *et al.*, 2012, p. 226). In contrast, the current study found a much higher reliability estimate ($\alpha = 0.89$). In addition, the reliability estimates associated with each of the three subscales obtained in the current study are fairly similar (task motivation = 0.71) or slightly better (constructive cognition = 0.78, behaviour awareness and volition = 0.85).

It can therefore be concluded that it is better to conceptualise the ASLQ as measuring a single factor (i.e. self-leadership). Although the sub-dimensions did exhibit acceptable estimates of reliability, it seems as if their use in future research may not add more theoretical support than what may already be gained from treating self-leadership as a single, strong general factor.

Practical implications

The authors recommend that practitioners and researchers use both the RSLQ and ASLQ as a research and development tool. When these questionnaires are applied as a research tool, they can be considered as a valid and reliable measure applicable in the South African working context.

Both the RSLQ and ASLQ can also help in the working context in identifying employees with poor self-leadership skills. In this way, the relevant development actions can be identified and implemented which, in turn, could contribute to improving the situation. Keeping in mind low productivity outputs amongst South African employees as indicated by Van Zyl (2009), improved self-leadership skills in the workplace can influence people to perform more effectively.

Applying the shorter version (ASLQ) will save time not only in research (especially when extensive research with many variables is conducted), but also when applied in the working context (especially considering that employees usually have limited time to complete questionnaires).

Limitations and recommendations

Although the current study provided some insight into the psychometric properties of self-leadership, the following suggestions are put forward in order to improve on the measurement of the self-leadership construct. Firstly, further investigation is needed into the factorial invariance of both the ASLQ and RSLQ amongst different language and racial groups in a South African context. It was not possible to validate both these measures in individual language and ethnic groups due to sample size constraints. Hence, future researchers should obtain samples with large enough groups representing the various language and ethnic groups to determine the measurement equivalence of the self-leadership construct. Secondly, there are more advanced statistical techniques, such as Rasch analysis, that should be used to supplement the results obtained in the current

study, especially with regard to unidimensionality. The Rasch model is the preferred technique to determine the unidimensionality of a construct (such as self-leadership).

Conclusion

The current study concludes that both the ASLQ and RSLQ have sound psychometric properties and can be applied within the South African working situation. When applying the longer version (RSLQ), researchers could use a composite score (representing self-leadership) as obtained from the bifactor model. The latter suggests the presence of a strong general factor. The shorter version (ASLQ), will save time when utilised in research and when applied in the work situation. In summary, the current study concludes that both the ASLQ and RSLQ are suitable for use within a South African context amongst working adults.

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Competing interests

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Authors' contributions

P.N. (University of the Free State) was the project leader and was responsible for the method, analysis, results and discussion sections. E.v.Z. (University of the Free State) was responsible for writing the introduction and literature review. Both authors collected data for the project, wrote the abstract and contributed to the list of references.

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