

Assessing the dimensionality of three LMX instruments within a diverse cultural and linguistic context*

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Multiple versions of the Leader-member exchange (LMX) instruments are widely utilized for exploring the quality of exchange between the leader/supervisor and the employees in leadership studies. Despite widespread usage, validation studies outside the USA are scarce. The purpose of this study was to analyze the psychometric properties of three versions of LMX instruments in the South African context. The factor structure, validity, and reliability of the respective versions were explored. The sample comprised of employees from the private (3598) and public (2640) sectors, from 106 organizations, across three independent studies. A three-factor structure was reported for 11 and 12 item instruments, which is different from the original four factor structure. The unidimensional 7 item instrument reported exceptionally good fit. The results of this study are useful for leadership researchers within the South African context, as they can use the LMX instruments with confidence, but it raises a question about the common practice of using foreign developed instruments for research purposes without testing its transferability to that specific context.

Keywords: leader-member exchange (LMX), LMX measurement, construct validity, external validity

Highlights:

- This study supports LMX as a multi-dimensional construct, with a three-factor structure (in contrast with the original four factor structure), combining two of the original LMX dimensions into a composite dimension.

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Acknowledgements. A.G. (Unisa Graduate School of Business Leadership) Data owner, provided leadership oversight and guidance over the study and executed the statistical analysis; R.B.M. (Unisa Graduate School of Business Leadership). Execution, literature review and writing of the study. *Disclaimer.* The views expressed in the submitted article are the authors own and not an official position of the institution or funder.

* Please cite as: Grobler, A., & Mathafena, R. B. (2021). Assessing the dimensionality of three LMX instruments within a diverse cultural and linguistic context. *Psihologija*, 54(1), 33–48. doi: <https://doi.org/10.2298/PSI191011019G>

- Validity, reliability, and transferability of the 7 item, 11 item, and 12 item instruments were established within the South African context.
- Although the 11 and 12 item instruments are similar (except for the addition of one item), the combination of the composite dimensions differs.
- Validation processes are needed when organisational research is conducted, particularly for multi-dimensional constructs especially when the respondents do not have English as their first language.

Leader-member exchange (LMX) has been defined by researchers as the quality of exchange between the supervisor and an employee (Dansereau et al., 1975; Graen & Cashman, 1975; Graen & Scandura, 1987). The quality of LMX has both organisational, team, and employee behaviour and performance implications. The benefits of healthy LMX are thought to include workplace creativity (Volmer et al., 2011), job satisfaction, performance, and wellbeing (Volmer et al., 2011). A study conducted by Martin et al. (2016) found LMX to have a positive impact on task performance, organizational citizenship behaviour, and these positive outcomes are mediated by trust, job satisfaction, and empowerment. Additionally, quality LMX was found to mitigate counterproductive work behaviours (Schriesheim et al., 1999). The findings of Gu et al. (2015) reported LMX to provide a mechanism for the acting out of moral leadership in organisations. Walumbwa et al. (2011) showed similar results where ethical leadership positively correlated with LMX, while various scholars, including Howell and Hall-Merenda (1999) as well as Wang et al. (2005) reported a direct relationship between LMX and transformational leadership. Stewart and Heather (2012) also reported a strong positive relationship between LMX and authentic leadership, a finding that is empirically supported by Wang et al. (2012). For the purpose of this study, authentic, ethical, and transformational leadership are regarded as hypothesized cognate constructs to LMX in order to assess the external validity of the LMX instruments. The study was conducted due to the importance of healthy leader member exchanges in organisations (Jing-Zhou & Wen-Xia, 2011), and more specifically in the South African context, that is going through socio-political as well as institutional transformation, accentuating the good employer and employee relations.

South African organisations can potentially benefit from studying LMX both empirically and theoretically, whilst considering the unique, dynamic and diverse cultural, and linguistic elements of the population. English research instruments are mainly used to study organisational phenomena, due to their availability and ease of use across the diverse population. It is important to mention that close to 75% of the population does not speak English as their first language, but English has been declared as the official language in South Africa and is taught as a compulsory subject in all schools.

Hofstede (2011) asserts that culture distinguishes one group from another, be it at a national or organisational level. Lee et al. (2014) argue that organisational interventions and leadership approaches need to consider the contextual and cultural values within which they operate. Their study, conducted in Korea, highlighted a need for a customised approach to LMX due to a prevalence of collectivism, which is opposite to the predominantly individualistic Western values. Furthermore, their results suggest country specific values such as power distance, gender roles, individualism, and collectivism have leadership implications, more specifically to perceiving the quality of LMX. Similarly, Rockstuhl et al. (2012) found that LMX in predominantly Western, individualistic cultures influences employee behavioural outcomes such as organisational citizenship, work engagement and commitment strongly. Whereas in the Eastern contexts with predominant vertical collectivist cultures (similar to South Africa), the quality of LMX remains important, but employee behaviours are significantly influenced by communal values, collective interests, and work obligations. Uhl-Bien et al. (2014) argue that LMX focus on a horizontal exchange, however the supervisor is the primary driver of the direction of the relationship. Culturally and linguistically South Africa seems to have characteristics of being socially, relationally, and collectivistically oriented, through being communal and placing emphasis on the interests of others in a collective sense (Wojciszke et al., 2009). Van der Colff (2003) raises questions as to whether there is harmony or conflict between African and Western notions of what leadership is, and how African cultural values such as Ubuntu “humanness” can be integrated into organisational practices. The theory, development, and validation of LMX has been conducted mostly in Western settings, and it is prudent to question its validity and applicability in Africa, and more specifically in the South African settings. Abdallah-Preteille (2006) asserts that cultures need to be contextualised based on social, political, and communication realities in order to allow for both diversity and plurality.

LMX has been studied in South Africa, specifically in terms of the relationship between LMX and organisational behavioural and performance outcomes but mainly with instruments that were not tested and validated for the South African context. Els et al. (2016) reported LMX to have a strong link with work engagement, and the organisational support for strengths usage. Radstaak and Hennes (2017) also found LMX to have a relationship with job engagement, mediated by social job resources and challenging job demands. Milner et al. (2007) examined the quality of relationship between LMX in relations to gender in South African organisations, and gender was found to be central in workplace social exchanges and organisational dynamics. Despite a fair amount of studies being conducted on LMX in South Africa, studies providing evidence of the applicability and transferability of the LMX measurements to the South Africa’s unique settings are still limited. The validation of LMX measurement(s) will enable the accurate measurement of the construct, to be used with confidence to predict organisational and employee performance and behavioural outcomes.

Defining and Measuring LMX

The theory of LMX initially conceptualised by Dansereau et al. (1975) through the exploratory research approach, was built upon the concepts relating to the quality of exchange between the supervisor and the employee, by applying the social exchange theory (Graen & Cashman, 1975; Liden & Maslyn, 1998). Additional conceptual underpinnings were proposed as the dimensions of LMX and consisted of mutual Affect, Contribution, and Loyalty (Graen & Scandura, 1987). The concept of Professional Respect was suggested later as a fourth dimension (Liden & Maslyn, 1998). Based on the work of Graen and Uhl-Bien (1995) a seven item (LMX7), and unidimensional scale was developed, and the 11 item multi-dimensional scale (LMX11) through the work of Dansereau et al. (1975) and Graen et al. (1987), who proposed a similar, 12-item scale (LMX12) (with one additional item). To date numerous and varying measurements of LMX have been developed to meet specific research purposes, such as the assessment of LMX from both the employee and supervisor perspectives (Greguras & Ford, 2006). The work of Dienesch and Liden (1986) supported the notion of multidimensionality of the LMX measurement, in contrast with the unidimensional seven-item scale. In terms of capturing the scope and nature of LMX, the dimensions of Affect, Loyalty, Contribution, as well as Professional Respect are suggested as the modes of exchange (social) and currencies between the supervisor and the employee (Greguras & Ford, 2006). The dimension of Contribution pertains to the perception of quality, degree, work effort, and a performance input contributed by each member as far as task outputs are concerned (Stephan et al., 1997). The employee would typically perform the delegated task, while the supervisor evaluates the quality of performance (Anitha, 2014). The quality of exchange develops when performance outputs are perceived to be good by the supervisor, and in exchange the employee receives support in the form of resources such as budget, information, developmental opportunities, and the allocation of challenging and interesting work. These resources typically support and enhances work performance (Liden & Maslyn, 1998), which motivates and drives the employee towards improved performance. Loyalty is the second dimension of the scale which gauges the extent of Loyalty, faithfulness, and support between the supervisor and the employee. Wong et al. (2002) found Loyalty to impact significantly on organisational citizenship behaviour and performance, while trust mediates Loyalty and interactional justice. Employees who are perceived to be loyal will be delegated tasks which require autonomy, participation in decision making, and independence as a reward. Loyalty is important in the development of sustainable of the work relationships. The Affect dimension is concerned with the extent of interpersonal liking, friendship and shared affection (Abosag & Naudé, 2014) within the dyad. The pair simply enjoy interpersonal interactions, within and through the work context. Hawke and Heffernan (2006) argue that interpersonal liking in the work place is important

for maintaining and improving performance and staff satisfaction. According to Wojciszke et al. (2009) being affective includes admiration, communion, and holding an attitude of interest in the care and wellbeing of the other. The fourth dimension is about the professional competence, which entails knowledge, skills and experience that the employee, and/or manager has acquired in their respective careers and profession, and to build a credible reputation (Wolfram et al., 2007). Therefore, Professional Respect is the acknowledgement and the recognition of another's competence and expertise be it the supervisor and/or employee (Sin et al., 2009).

Purpose and Aims

Evidently, most validation studies on LMX have been conducted mainly utilising Western populations and samples, and often samples that are homogeneous, e.g., specific occupational categories and post graduate students (more specifically MBA students). This study is conducted in response to a call for the development and validation of measurements within a diverse multi-lingual and multi-cultural contexts. This is deemed necessary since the majority of the South African population does not speak English as a first language, which might influence their ability to differentiate between the finer nuances of the items.

Firstly, the study attempts to empirically test whether the operationalization of the measurement of LMX in South Africa's organisational environment, differs from that of Western conventions. This will be done from an etic stance, thus assessing the current instruments, without any adaptations of the items or the exploration of what LMX entails within the South African context (from an emic stance). The rationale for this is inspired by the claims by various scholars that cultures and nationalities differ in how they perceive, interpret, and understand LMX, while considering the dimensions of Affect, Loyalty, Contribution, as well as Professional Respect. As a result, the instrument(s) will be assessed in terms of their potential to measure the intended characteristics accurately and consistently, taking into consideration the varying settings in which they have been developed and validated. Secondly the study intends to explore whether LMX is appropriately characterised in the South African context as being unidimensional through the 7-item instrument (LMX7), or a multidimensional construct through both the 11 (LMX11) and 12 (LMX12) items instruments. The aim and contribution of this study are thus to assess the appropriateness of the practice to simply use instruments (such as the LMX instruments, but many other as well) developed and validated within another context (in this instance, three versions of LMX instruments), without assessing its scientific properties within their context. A further aim and contribution are to provide South Africa's organisational and leadership scholars with validated instruments to measure LMX in an accurate and credible way.

Method

Participants and Procedure

This study is based on three separate studies, independent of each other over a three-year period, and referred to as Study¹, Study², and Study³. Sixty employees were sampled in each of the 106 organisations that participated in the study. Due to the fact that the sampling of respondents was mainly based on their accessibility and availability, the sampling method can be regarded as a convenience sample. The fieldwork was conducted by 106 co-researchers working on a larger project. Ethical clearance for all three the studies were granted by the institution’s Research Ethics Committee, which includes the permission by the participating organisations, as well as all the respondents.

The number of respondents per study and sector, the gender representation, as well as the mean age and tenure per study are reported in Table 1.

Table 1
Characteristics of the Sample (N = 6238)

		Study ¹		Study ²		Study ³		Combined	
		<i>n</i>	%	<i>n</i>		<i>n</i>	%	<i>n</i>	
Sector	Private	1436	72.7	992	56.0	1170	47.0	3598	57.7
	Public	539	27.3	779	44.0	1322	53.0	2640	42.3
Gender	Male	1038	52.0	924	52.9	1140	49.6	3102	51.6
	Female	930	48.0	824	47.1	1160	50.4	2914	48.4
Position	Management	678	34.2	600	34.2	822	33.5	2100	34.0
	Non-management	1307	65.8	1154	65.8	1633	66.5	4094	66.0
Language	English	478	24.0	313	18.0	425	17.1	1216	20.25
	Non-English	1509	76.0	1444	82.0	2059	82.9	5012	79.75
Education	< Grade 12	80	4.0	67	3.8	79	3.2	226	3.65
	Grade 12	517	26.0	318	18.2	504	20.4	1339	21.62
Education	1 st degree / diploma	834	42.0	805	46.1	988	40.0	2627	43.43
	Higher degree / diploma	556	28.0	557	31.9	887	35.9	2000	32.30
<i>Mean age</i>		38.03 (<i>SD</i> = 9.63)		38.40 (<i>SD</i> = 9.53)		38.68 (<i>SD</i> = 9.26)		38.36 (<i>SD</i> = 9.35)	
<i>Mean tenure</i>		8.80 years (<i>SD</i> = 8.01)		8.83years (<i>SD</i> = 7.65)		8.62 years (<i>SD</i> = 7.39)		8.72 years (<i>SD</i> = 8.11)	

Organisations in both the private as well as the public sector have participated in the studies, with the private sector being somewhat better represented (57.7%), which is a true reflection of the South African sectoral composition. The mean age of the combined sample was 38.36 years (*SD* = 9.35), and the mean tenure in the specific organisation was 8.72 years (*SD* = 8.11). Modest differences were detected in terms of age and tenure across the three studies. Males were slightly better represented in the combined sample with 51.6%, like Study¹ (52%) and Study² (52.9%). However, females were better represented in Study² with 50.4%. Language is regarded to be an important aspect of this study, and it is therefore deemed necessary to report the language and educational demographics of the sample. The majority of the sample (79.25%) has reported that one of the 11 official South African languages, other than English is their first language. Close to 97% of respondents

of the overall sample (like the three independent studies) have a highest educational level of Grade 12 or higher, which is an indication that, although English is not the majority's first language, they are well versed in English. It is important to mention that English is a compulsory subject in the South African schools, and that it is the official language of the country, also in all organisational settings.

Ethical clearances for all three studies were granted by the institution's Research Ethics Committee, which includes the permission by the participating organisations, as well as all the respondents.

Measures

It is important to note that no adaptation of any of the instruments took place. The study is therefore regarded as an etic study, by analysing the instruments, as found in the academic public domain, as is. Three versions of LMX measures were used. The version used in Study¹ was the unidimensional LMX7 by Graen and Uhl-Bien (1995). The instrument uses a differentiated 5-point scale, ranging from Rarely, Occasionally, Sometimes, Fairly often and Very often for items like "Do you know where you stand with your supervisor (follower)". Items like "How well does your supervisor (follower) recognize your potential?" are responded to on a scale ranging from *Not at all*, *A little*, *Moderately*, *Mostly to Fully*. The Cronbach alpha coefficient claimed by the developers of this unidimensional instrument, ranges between .80 and .90.

In Study², the LMX11 version was used, developed by Liden and Maslyn (1998). The instrument is multi-dimensional, with Affect-, Loyalty and Contribution and Professional Respect as dimensions/factors. Typical items of the four factors are "I like my supervisor very much as a person"; "My supervisor would defend me to others in the organisation if I made an honest mistake"; "I do work for my supervisor that goes beyond what is specified in my job description", and "I am impressed with my supervisor's knowledge of his/her job", respectively. Cronbach alpha coefficients of .90, .78, .59, .89 were reported for the respective factors by Liden and Maslyn (1998).

Finally, in Study³ the LMX12 version, was used. This version is exactly the same as the LMX11, but with the addition of one item to the Contribution factor. This added item reads "I do not mind working my hardest for my supervisor". Liden and Maslyn (1998) reported Cronbach's alpha coefficients of .90, .78, .60, and .92 for their student sample and .90, .74, .57, and .89 for their organisational sample across the four factors respectively. Similarly, Greguras, and Ford (2006) reported reliabilities of .90, .84, .75, and .93.

In order to examine external validity of the instruments, additional measurements were conducted. These leadership constructs were included in the analysis based on its hypothesised and empirically proven relationship with LMX. These cognate leadership constructs were measured by instruments all with Cronbach alpha coefficients of .70 and above, were included in this study to assesses the LMX instruments' external validity: *Authentic leadership* (by Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008), *Transformational leadership* (by Podsakoff, MacKenzie, Moorman, & Fetter, 1990), and *Effective change leadership* (Isaacs & Grobler, in press).

Data Processing

The analysis was conducted with Statistical Package for the Social Sciences (SPSS) version 25 for the descriptive and correlational statistics as well as the Exploratory Factor Analysis (EFA). The Analysis of a Moment Structures (AMOS) version 25 was used for the Confirmatory Factor Analysis (CFA) (IBM, 2017).

Results

Exploratory Factor Analysis

The dimensionality and the factorial structure of each of the versions of the instruments were explored. The Kaiser-Meyer-Olkin measure yielded values of .92, .90, and .91 for Studies 1, 2, and 3 respectively, exceeding the critical value of .60 (Tabachnick & Fidell, 2007); the Chi-square values were significant and smaller than .001. The EFA conducted with Promax rotation supported a one-factor solution for LMX7, with 63% of the variance explained, exceeding the values reported by Meyers et al. (2013) of 50%. The LMX11 and LMX12 instruments yielded three-factor solutions, explaining 73% and 72% of the variance respectively, corroborated by both the Cattell's scree plots and Monte Carlo parallel analysis. Importantly the communalities for all three instruments are high and all above .50. The pattern matrix (Promax rotation) indicated that all the original items load on the extracted and retained factors of both the LMX11 and LMX12 instruments, but within a different structural permutation. The original LMX factor called Contribution, consisting of two and three items in the LMX11 and LMX12 versions respectively, remained a factor on its own in both studies. Interestingly, the Affect factor combines with another (but different) factor in each of the studies. It is important to note that the original Affect and Professional Respect factors formed a combined factor in the LMX11 instrument, whilst Affect and Loyalty combined in the LMX12 version (resulting in a sum total of six items). Both these composite factors explained approximately 52% of the variance in LMX.

The descriptive statistics as well as the internal consistency (Cronbach alpha), an initial assessment of convergent and discriminant validity on item level of the unidimensional LMX7 (Study¹) and the three-factors of the LMX11 and LMX12 versions (Study² and Study³ respectively) are reported in Table 2.

Table 2
Descriptive Statistics, Cronbach's Alpha, Convergent and Discriminant Validity of the Factors Retained in the Three Independent Studies

	Study ¹ LMX7	Study ² LMX11				Study ³ LMX12			
	One-factor solution	Three-factor solution				Three-factor solution			
		A&PR	L	C	Tot	A&L	C	PR	Tot
<i>Mean</i>	3.56	3.75	3.46	3.98	3.73	3.56	4.04	3.93	3.77
<i>SD</i>	.84	.82	.87	.80	.69	.89	.84	1.02	.78
<i>Skewness</i>	-.59	-.62	-.50	-.73	-.63	-.45	-.93	-.95	-.54
<i>Kurtosis</i>	-.03	.22	.25	.53	.51	-.12	.97	.49	.18
<i>A</i>	.90	.91	.83	.65	.90*	.89	.77	.91	.92*
<i>CR</i>	.92	.92	.87	.85	.96*	.89	.86	.92	.97*
<i>AVE</i>	.63	.65	.69	.74	.68*	.59	.64	.79	.70*
<i>MSV</i>	.45	.67	.52	.24	.67*	.53	.31	.59	.49*
<i>ASV</i>	.31	.41	.22	.24	.22*	.34	.28	.42	.24*

Note. LMX7 = 7-item instrument; LMX11 = 11-item instrument; LMX12 = 12-item instrument; A&PR = Affect & Professional Respect; L = Loyalty; C = Contribution; A&L = Affect & Loyalty; PR = Professional Respect, and Tot = Total.

*for future reference should LMX be regarded and used as a unidimensional construct.

All the skewness and kurtosis values reported in Table 2, do not exceed the critical values of 2 and 7, respectively (West et al., 1995), which means that the normality assumption was met for this sample and no data transformations would be required. The Cronbach's alpha coefficients for all the factors as well as the total instruments are regarded as being acceptable if the guideline of $\alpha > .70$ (Nunnally & Bernstein, 1994) is applied. Convergent validity of the items was confirmed by means the Composite Reliability (CR) and the Average Variance Extracted (AVE), with critical values of $> .70$ and $> .50$ respectively. The discriminant validity of each of the items was further determined by comparing the AVE with the Maximum Shared Variance (MSV). Satisfactory discriminant validity was reported with $MSV < AVE$ and the Average Shared Variance (ASV) is less than the AVE (Hair et al., 2010).

Confirmatory Factor Analysis

The construct validity of the unidimensional LMX7 and the structurally adjusted LMX11 and LMX12 versions were assessed by means of a CFA. The results of the models analysed are reported in Table 3.

Table 3
Comparison of a Priori Factor Structure for the Three Versions of LMX Instruments

Structure: LMX7	χ^2	df	χ^2/df	CFI	TLI	SRMR	RMSEA
One-factor model (all 7 items)	7.41	2	3.71	.99	.99	.01	.037
Structure: LMX11	χ^2	df	χ^2/df	CFI	TLI	SRMR	RMSEA
One-factor model (all 11 items)	122.46	15	8.16	.99	.97	.02	.064
First order structure (3 factor structure)	167.09	27	6.19	.99	.98	.02	.054
Second order structure (3 factors with secondary factor)	148.03	26	5.69	.99	.98	.05	.052
Structure: LMX12	χ^2	df	χ^2/df	CFI	TLI	SRMR	RMSEA
One-factor model (all 12 items)	119.43	14	13.34	.99	.97	.02	.057
First order structure (3 factor structure)	347.01	37	9.38	.98	.97	.03	.060
Second order structure (3 factors with secondary factor)	208.75	35	8.02	.99	.97	.03	.055

Note. LMX7 = 7-item instrument; LMX11 = 11-item instrument; LMX12 = 12-item instrument; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root mean square residual; RMSEA = root mean square error of approximation.

From Table 3 it is evident that the LMX7 version (unidimensional), reported good fit statistics, with $\chi^2/df(7.41) = 3.71$, CFI = .99, RMSEA = .037. Three models were assessed for the multi-dimensional LMX constructs as measured by the LMX11 and LMX12 versions respectively. The best fitting model for both versions, is the second order structure, with the three factors (which differ in terms of composition between the two versions), loading onto a secondary factor.

The fit statistics for the LMX11 version, where the three factors, namely Affect and Professional respect, Loyalty and Contribution load onto the overall LMX factor are $\chi^2/df(148) = 5.69$, CFI = .99, RMSEA = .052. The LMX12

version, with Affect and Loyalty, Contribution and Professional respect as factors loading onto the LMX secondary factor was also found to have good fit statistics with $\chi^2/df(209) = 8.02$, CFI = .99, RMSEA = .055.

External Validity Analysis

An assessment of external validity of the LMX7 version and the three factor solutions (for LMX11 and LMX12 respectively) by means of correlations with cognate leadership constructs was conducted. The LMX instruments were further assessed for external validity, by means of correlations between their total scores and sub-factors (LMX11 and LMX12) and related organisational behaviour constructs. The results are reported in Table 4.

Table 4
A Heterotrait-Mono Method Assessment of the External Validity of the Respective LMX Versions by Means of Correlations with Cognate and Related Constructs

Version	Cognate construct	A&PR	A&L	L	C	PR	Tot
Leadership constructs							
LMX7							.61
LMX11	Authentic leadership	.46		.39	.24		.48
LMX12							
LMX7							.78
LMX11	Transformational leadership	.69		.54	.35		.69
LMX12							
LMX7							
LMX11	Effective change leadership						
LMX12			.34		.20	.31	.35
Organisational behaviour constructs							
LMX7							.54
LMX11	Person-organisational fit	.39		.26	.29		.40
LMX12	total score		.31		.27	.33	.36
LMX7							-.39
LMX11	Turnover intention	-.35		-.18	-.11		-.31
LMX12			-.26		-.20	-.27	-.29
LMX7	Psychological contract						.49
LMX11	(by the organisation)	.29		.30	.30		.35
LMX7	Perceived organisational						.29
LMX12	support		.38		.29	.37	.41
LMX11	Psychological capital	.30		.21	.35		.34
LMX12			.37		.39	.22	.39
LMX7							
LMX11	Employee engagement						.45
LMX12							
LMX7	Job satisfaction						.45
LMX11	Organisational energy	.42	.24	.31			.42

Note. LMX7 = 7-item instrument; LMX11 = 11-item instrument; LMX12 = 12-item instrument; and PR = Affect and Professional Respect; A&L = Affect and Loyalty; L = Loyalty; C = Contribution; PR = Professional Respect, and Tot = Total.
All correlations = $p < .05$.

The assessment of external validity yielded high correlations between *Transformational leadership* and the *LMX total scores* with .78 (for LMX7) and .69 for LMX11. The subfactors of LMX11 and to some extent the LMX12 also had relatively high correlations with the related measures, with *LMX Contribution* having the lowest correlations, ranging from .20 to .35.

The correlation between the *LMX total score* (LMX12) and the *Effective change leadership* total score is slightly lower than .40 whilst correlations between the total scores of LMX7 and LMX11 and Authentic and Transformational leadership are close to or above .50 (all $p < .05$). That is regarded as a high correlation according to Gregory (2011).

The correlations with the related organisational behaviour constructs range from -.11 to .54. Correlation coefficients reported in the table above support the external validity of all LMX instruments and particularly of their total scores. The obtained correlations are all statistically significant ($p < .05$) and close to or higher than .40, as expected, given the similarity between these constructs and LMX.

Discussion

The main aim of the study was to assess the construct validity of three LMX measures, including the unidimensional LMX7, and the multi-dimensional LMX11 and LMX12 versions, in the culturally and linguistically diverse South African organisational context. This was deemed necessary due to the relatively scarce research on the LMX instruments (outside the USA where it originates from). LMX is a popular leadership construct, regarded to be important as literature and empirical studies indicate that it has a positive effect on employee as well as organisational well-being and performance. It is therefore regularly researched, especially within collectivistic cultures, such as South Africa, where collaboration, respect, and participation are valued. The challenge however, is that researchers mainly use instruments developed and validated in foreign countries, and use them in their original form, assuming that they will provide valid and accurate measurements of studied phenomena. This situation is further exacerbated by the fact that South Africa is a very diverse country, in terms of cultures and especially languages (11 official languages), with most citizens not speaking English as their first language. This might have an impact on research results obtained by means of surveys, as it is usually (just like the three LMX versions) administered in English.

It was not intended in this study to explore what LMX entails within the South African culture (based on the emic approach), but rather to assess the suitability of the original three versions of instruments, thus from an etic stance. These instruments are the 7-item instrument (LMX7) (unidimensional) developed by Graen and Uhl-Bien (1995), and the 12-item (LMX12) and 11 item (LMX11) instruments that are exactly the same, except for one additional item in the 12-item instrument. Both of these instruments were developed by Liden and Maslyn (1998), and consist of four factors, namely Affect, Loyalty, Contribution, and Professional Respect. The developers have reported acceptable psychometric properties for all three instruments.

In order to assess the instruments' cross-cultural equivalence, dimensionality, and factor structure an EFA and a CFA were performed, together with the assessment of external validity, on item as well as factor / construct level.

To summarise the results, the LMX7 was confirmed to be unidimensional, with good fit statistics and good external validity regarding the LMX overall unidimensional construct. This has been determined through the correlations with cognate leadership constructs, such as Authentic and Transformational leadership, and related organisational behaviour constructs, such as person-organisational fit, employee engagement, etc.

The LMX11 and LMX12 both yielded three factor solutions, in contrast with the original four factor solution by Liden and Maslyn (1998), explaining close to 52% of the variance respectively. The respective three factor solutions are however different, with the Affect factor combines with another (but different) factor in each of the studies. It is important to note that the original Affect and Professional respect factors formed a combined factor in LMX11, whilst Affect and Loyalty combined in LMX12 (resulting in a sum total of six items). This finding supports Graen et al.'s (1995) opinion that the LMX instrument and its item composition remains to be controversial. The empirical findings of this study resonate with those of Liden and Maslyn (1998) (combining Affect and Loyalty items) which they contribute, (probably also relevant for the South African population), to the respondents not able to distinguish the between the items that loaded on the impacted dimensions. The factors that formed a combined factor, namely Affect and Loyalty and to some effect Professional Respect have subjective characteristics which might be difficult to distinguish, even more so in a context where English is not necessarily the respondents first language. This is opposite to the objective and performance related dimension of Contribution which remained consistent across both studies.

The process followed with the LMX7 to assess structural validity was repeated for the LMX11 and LMX12 instruments, with both meeting the requirement, especially the overall scores (thus the respective LMX total scores). This was also confirmed through the CFA, where both instruments reported good fit with the best fitting model being the secondary model. This entails that the three factors (which differ between the LMX11 and LMX12), and all the original items, load onto a secondary factor, namely LMX as an overall construct.

The findings of this study therefore suggest that all three versions of the instruments can be used with confidence within the South African context, but the multi-dimensionality of the LMX11 and LMX12 should be handled with caution. It is recommended that LMX rather be analysed as a secondary factor, thus the sub-factors loading onto the overall construct of LMX. The original sub-factors and even the factors extracted and confirmed in this study should not be used and analysed in isolation due to the inconsistent results found in this study. It is therefore prudent to analyse and interpret the LMX total score. The level of measurement invariance or equivalence between the results reported in this study, and that of the original US study seems only to be on the LMX total scores, and not the respective subfactors.

The critical finding of this study relates to construct validity and specifically the transferability of the LMX measurement (and probably for other instruments) from the USA to the South African context.

The applicability of the multi-dimensional scales should be explored through extensive research within different contexts, to increase the understanding of how the various dimensions are understood and interpreted. This is specifically applicable where the population does not speak English as a first language. In terms of LMX, Rockstuhl et al. (2012) suggests extended research on the role of culture in LMX, more specifically from a vertical collectivistic view point. The etic approach followed by the study preserved the originality of the instruments with its items, which has the potential of creating a cultural, language and contextual distance or remoteness. A true emic study defining or redefining LMX in South Africa might yield rich, sensitive and insightful knowledge of LMX.

Methodologically, the study presents with some imperfections as most contemporary organisational and leadership studies which rely on the self-reporting of the participants. The study is confined to a cross-sectional design approach, although the data was collected within the same population, but with three different samples. Longitudinal studies, utilising the same sample would substantially corroborate the findings and conclusions of this study. The unit of analysis could be a concern as the study focused on the employee's perceptions of the quality of exchanges, and not the managerial perceptions of the relationship. The limitations, notwithstanding the findings presents the three LMX instruments as credible and applicable to the applied settings.

In conclusion, the item wording, the number of items as well as the scale (the difference in the five-point Likert scales used) do not matter, as all three instruments were found to possess construct validity. The structural configuration of the multi-dimensional instruments is however sensitive to the context, as the EFA and the CFA yielded a different structural configuration for the multi-dimensional instruments.

Finally, the practical and academic contribution provided by the study is a validated measure to be used by scholars and researchers in South Africa, and more specifically the 7-item instrument and the overall, combined LMX scores for the multi-dimensional instruments. This study emphasises the context sensitivity of surveys, especially when it measures constructs with instruments that are imported. This should serve as caution to all researchers to merely use an instrument developed in and for a different context (especially first language and culture), without validating it for their specific population. It may not only raise scientific challenges, but also ethical and academic professional questions.

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Procena dimenzionalnosti tri instrumenta za procenu kvaliteta razmene između vođe i sledbenika unutar šarolikog kulturnog i jezičkog konteksta Južne Afrike

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Više različitih instrumenata za procenu kvaliteta razmene između vođe i sledbenika (eng. Leader-member exchange; LMX) se se redovno koristi u ispitivanju razmene između lidera/supervizora i zaposlenih u istraživanjima liderstva. Uprkos širokoj upotrebi, validacionih studija koje se bave ovim instrumentima van SAD je malo. Cilj ovog istraživanja je bio da se ispituju psihometrijska svojstva tri instrumenta za merenje LMX u Južnoj Africi. Ispitana je faktorska struktura, validnost i pouzdanost ovih instrumenata. Uzorak se sastojao od zaposlenih u privatnom (3598) i javnom (2640) sektoru iz 106 organizacija prikupljenih u tri nezavisne studije. Trofaktorska struktura se pokazala kao optimalna za instrumente sa 11 i 12 ajtema, iako su faktore činile različite kombinacije originalne četvoro-faktorske strukture. Jednodimenzionalni instrument sa 7 ajtema je pokazao izuzetno dobro uklapanje u podatke. Podaci su potvrdili i eksternu validnost ovih instrumenata, što govori da je opravdano koristiti ove instrumente u Južnoj Africi, ali postavlja i pitanja opravdanosti korišćenja stranih instrumenata u istraživačke svrhe bez procene ekvivalentnosti (konstrukta prim.prev.) u specifičnom kontekstu u kom će se koristiti.

Ključne reči: kvalitet razmene između vođe i sledbenika (LMX), merenje kvaliteta razmene između vođe i sledbenika, konstruktna validnost, eksterna validnost.

RECEIVED: 11.10.2019.

REVISION RECEIVED: 15.01.2020.

ACCEPTED: 22.01.2020.

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