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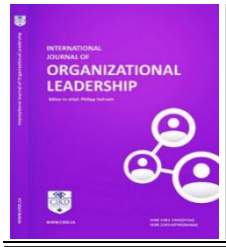

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Leader-Member Exchange Through a Vertical Extension Across the University Organization Structure

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ABSTRACT

This study aimed to investigate the synergy of Leader-Member Exchange (LMX) relationships within University Organizational Structure (UOS), focusing specifically on the positions of College Deans (CDs), Department Heads (DHs), and Faculty Members (FMs). The LMX of HDs was assessed in two directions simultaneously with CDs and with FMs. The study explored the correlations and differences between these two LMX directions, considering their sub-dimensions: trust, respect, and commitment. Using a survey on a sample consisting of 60 DHs (55% of the study population) and utilizing the LMX-7 scale at a Saudi university, the findings revealed the following: (1) the overall quality of LMX within the defined vertical extension of the UOS is high, characterized by a predominance of in-groups at the expense of out-groups; (2) there is a statistically significant correlation between DHs' LMX with CDs and their LMX with FMs; (3) DHs exhibit higher levels of trust in CDs than in FMs; and (4) the trust as a sub-dimension is dominant over the other two sub-dimensions of LMX—respect and commitment. Although this study has been conducted in the context of higher education, it is grounded in LMX theory; thus, its results may enrich the literature by bridging the gap that exists between administrative and human structures in LMX studies. Additionally, it enhances the understanding of relational extensions through the organizational structure of LMX dyads, which may represent a new direction in the LMX literature.

There is a contemporary research trend toward leadership in higher education. However, Hassan & Chua (2008) argue that "leaders in higher education have been greatly criticized for their failure to apply the literature on leadership and management to maintain and advance their institutions in today's increasingly complex internal and external environments." (p. 16). Accordingly, in what may be considered a response to such criticism, Stokes (2018) referred to

the fact that LMX theory is suitable for understanding change in universities because it enables the study of problems related to human interaction within university structures.

However, the criticism of leaders in higher education may not be consistent with investigations of LMX relationships in this field. Many previous international studies on LMX theory have indicated that the level of LMX relationships is high and very high in most higher education organizations between the various parties of the relationship and by different measures of the relationship. Therefore, there is a predominance of the In-groups (members close to the leader who receive advantages) at the expense of the Out-groups (members who are far from the leader and who are limited to formal relations). These studies are summarized in Table 12.

To verify these high and very high levels of LMX relations in higher education, this study aimed to measure the department head DH relationship simultaneously with their leader, who is the college dean CD (LMX-A), and their member, who is the faculty member FM (LMX-B), and then mix these two directions to obtain an estimate of a third total direction (Bi-LMX), and then answer the first question of this study, which is:

Question1. What are the levels of LMX-A, LMX-B, and Bi-LMX estimated by the DHs?

From the perspective of variables, the correlation between the LMX relationship and many variables was examined extensively and previously (see Table 1). The median role of the LMX relationship in modeling structural equations by SEM was also examined (Table 2). However, there is a worthwhile topic: to study the relationship between the two directions of the LMX relationship of an intermediate leader (DH in this study) and the treatment of these two directions as independent and dependent variables, alternately, as follows:

Many studies have reported high levels of LMX's relationships in higher education in an upward direction with the leader (LMX-A), including studies of (Azam et al., 2022; Brown et al., 2019; Estel et al., 2019; Farr-Wharton et al., 2018; Ghaus et al., 2018; Hameed et al., 2020; Hanley et al., 2024; Horne et al., 2016; Ishaq et al., 2012; Jacques et al., 2012; Matta et al., 2015; Pauli et al., 2018; Pellegrini et al., 2010; Selekler-Goksen et al., 2016; Sheeraz et al., 2020; Sollitto et al., 2016; Van der Heijden & Spurk, 2019; Waskito et al., 2020; Wijaya, 2019; Zhao et al., 2021).

On the other hand, other studies have reported similar levels of LMX relationships in higher education in a downward direction with the member (LMX-B), including studies of (Çelik & Öngel, 2022; Dal & Çorbacioğlu, 2014; Hayden, 2011; Meng et al., 2017; Raza, 2021).

The relationship between the upward and downward directions as variables remains unknown. However, in the case of a relationship between them, it logically means that developing one of the two directions will be reflected in the other, and at the same time, it supports the fact that the high level of the LMX relationship is common in higher education. Accordingly, this study sought to answer the following second question:

Question 2. Is there a significant correlation between LMX-A and LMX-B?

On the other hand, investigating the differences between the upward and downward directions of the LMX relationship of the intermediate leader leads to exploring any dimensions of the LMX relationship contributing to the correlation between its two directions. To examine that, this study sought to answer the following question:

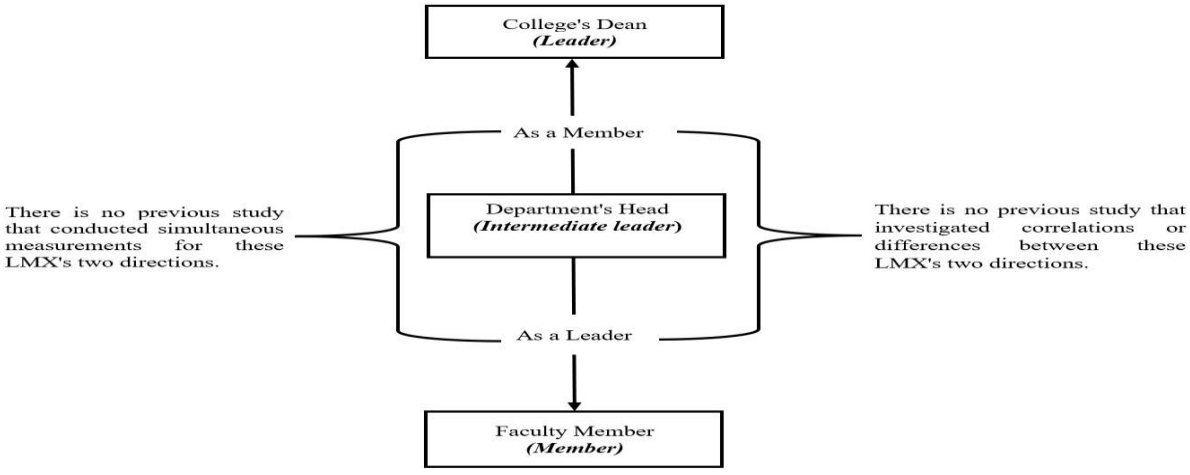
Question 3. Is there a significant difference between LMX-A and LMX-B? in which dimensions?

This study acquires theoretical importance in terms of responding to repeated calls to study how LMX relationships synergize across organizations, and on the other hand, it is practically important in developing LMX relationships across the extensions of the organizational structure—of the university in this study—where LMX theory is limited in many of its studies to the behavioral/human aspect, in isolation from purely administrative aspects such as organizational structure.

The LMX literature has frequently and persistently highlighted the need to conduct different levels of analysis in leadership research, open a vast new domain for such research, acknowledge the leadership structure, understand its operations within organizations, and consider the organization-wide dyadic makeup of the leadership structure. This means going beyond viewing groups and networks as the sum of their dyadic components and network assemblies to investigate the synergistic effect of dyadic relations. This would enable us to understand the relationship between various dyadic relationships across organizations and gain a complete picture of effective organizational leadership (Graen & Uhl-Bien, 1995; Power, 2013). From a more detailed perspective, there is still a pervasive assumption that the Leader-Leader Exchange (LLX) is an important factor in an organization's social network. Leaders who are not trusted by their leaders, given their weak position, cannot trust others (members). Additionally, there are indications that leaders imitate their leaders (Herdman et al., 2017). Therefore, when a leader develops a high-quality LLX with his/her leader, this is reflected in their members sharing good fortune. "In contrast, when a leader fails to develop a high-quality LLX with their leader, their members suffer from what might be called misfortune. One reason for the lack of attention to LLX's role at the group level is the absence of a coherent theoretical framework to understand how different levels of LLX affect group-level functioning" (Herdman et al., 2017, p. 1503). Such calls justify this study's claim of a research gap in the literature on LMX theory, as follows. Figure 1 illustrates and summarizes a notable research gap in the LMX literature—at least in higher education—represented by the simultaneous study of the two directions of the LMX of an intermediate leader within the organizational structure and examines the existence of correlations or differences between the two directions of the LMX relationship.

Figure 1

The Research Gap in the LMX Literature



This study focuses on academic university organizational structure UOS—in the category of DHs—and simultaneously assesses their LMX in two directions: with FMs (LMX) and CDs (LLX), considering that DHs are in intermediate leadership positions, as they are direct leaders to FMs and simultaneously represent direct members of CDs. It should be noted that a DH can also be considered an intermediate member; therefore, their evaluation of LMX between themselves and their direct leader (CD) may reflect their LMX relationship with their members (FM). Therefore, questions may arise about the LMX levels in both directions, their averages in the third direction, and whether there are correlations or differences between them. These questions represent the present study's problem.

Theoretical Backgrounds

LMX Theory Identity

The scope of LMX theory makes the leader-member relationship unique. It focuses on the quality of the relationship between leaders and their members as an exchange process, an analytical unit, and a central point in leadership that is affected by the characteristics of both (Graen & Uhl-Bien, 1995; Hayden, 2011; Northouse, 2016). LMX argues that leaders develop differentiated quality relationships with their members. Therefore, leadership has been redefined as the relationship between a leader and each member (Caliskan, 2015). LMX suggests that the bilateral relationship between leaders and their members is shaped according to the degree of exchange influence, support, and trust, and each leader-member relationship is unique because the members' roles are unique; thus, LMX emphasizes that leaders must adjust their behavior according to the different behaviors of each member rather than relying on Average Leadership Style (Caliskan, 2015; Le Blanc & González-Romá, 2012). This leads to examine the evolution of LMX.

LMX Theory Evolution

LMX theory was developed from the Vertical Dyad Linkage (VDL) approach, which Dansereau, Graen, and Cashman formulated during the 1970s. This approach focuses on the nature of the dyad links that a leader establishes with each member at an analytical level, thus considering the work unit as a series of dyad links between leaders and each of their members. Thus, the theory was renamed the LMX theory by Graen, Novak, and Somerkamp (Hayden, 2011; Naktiyok & Emirhan Kula, 2018; Northouse, 2016). Hereafter, LMX was generally reinforced as a clear-cut stage in the evolution of leadership theory. However, LMX theory internally has developed in multiple directions. It is important to shed light on the descriptive and normative directions as the most prominent directions of LMX evolution.

Descriptive Direction

LMX theory views leaders as not developing the same relationship with members but rather developing different relationships ranging from low-quality to high-quality ones. According to these differentiations, LMX named the members with low relationships as *The Out-group* and those with high relationships with the leader as *The In-group* (Estel et al., 2019; Graen & Uhl-Bien, 1995; Sollitto et al., 2016). If LMX had been limited to this direction, it would not have had the scientific and applied value it has today.

Normative Direction

Given its previous initial descriptive direction, some criticism has been directed at the LMX theory. Accordingly, LMX took a normative/directive direction that complemented the descriptive direction. The LMX's normative direction guides leaders regarding actions to take, especially regarding justice, eliminating implicit bias, reducing relationships that exclude some individuals, and avoiding establishing an out-group as much as possible (Graen & Uhl-Bien, 1995; Northouse, 2016; Power, 2013). This direction has made LMX an attractive theory for leadership practitioners as well as researchers, which has made subsequent directions not without its dominance alongside the descriptive direction.

Organizational Structures Between Administrative and Behavioral Dimensions

According to Moorhead and Griffin (2012), Max Weber's bureaucratic theorization in the early 1900s toward organizational structure focused on the hierarchy of authority, rules, and procedures. This was followed shortly by another classic theorization by Henri Fayol, who presented the organizational structure within the framework of the functions of management and his 14 rules of management. However, both theorizations remained far from human or behavioral dimensions, such as leadership, until Rensis Likert developed his theorization toward organizational structure in the 1960s, which drew attention to its human/behavioral dimensions, which he called the human structure (Moorhead & Griffin, 2012), including leadership. However, the human structure should not abolish the organizational structure in its administrative dimension, nor vice versa; rather, they should co-exist.

In universities, for instance, the classic organizational structure is stable in the long term, whereas the human structure, which focuses on academic leadership, is characterized by short-term changes due to the principle of succession of leaders in various academic leadership positions, whether through appointment or election.

One of the most prominent features of (UOSs) is the presence of a stable vertical extension in the long term, which is represented by CDs, Department Head (DHs), and Faculty Members (FMs). However, when viewed from the perspective of leadership - as a behavioral dimension – there are changes in the extension in the short term due to the periodic rotation of academic leaders (CDs and DHs in particular), which has justified the need to consider the occupancy of this vertical extension by effective leaders through ensuring the greatest quality of exchange between leaders and members. This leads to a discussion of the research gap observed in the LMX theory literature.

Literature Review

The researcher conducted an extended follow-up of LMX studies, which all ranged between five directions; no one aimed to extend LMX across the organizational structure. Studies on LMX theory are countless; therefore, the following review will be limited to examples from those conducted in higher education.

Many studies have examined LMX in higher education by focusing on the LMX relationships as a dependent or independent variable or/and the relationship between LMX and organizational or individual outcomes for students, academics, administrators, etc. They

revealed relationships between high-quality LMX and organizational or individual outcomes. (See Table 1).

Table 1

Studies in Higher Education that Revealed Relationships between High-quality of LMX and Organizational or Individual Outcomes

Organizational or individual outcomes	Studies
Job satisfaction.	(Hayden, 2011).
Students' academic outcomes and efficacy, social connectedness with peers, academic performance, perceived organizational support, social integration and academic self-concept.	(Jacques et al., 2012).
Organizational assimilation, organizational identification, work motivation, and career relevance.	(Sollitto et al., 2016).
Servant leadership.	(Dal & Çorbacioğlu, 2014).
Graduate student creativity.	(Zhao et al., 2021).
Affective organizational commitment.	(Brown et al., 2019).
FMs' engagement.	(Hanley et al., 2024).
Paternalistic leadership.	(Pellegrini et al., 2010).
Organizational citizenship behavior.	(Selekler-Goksen et.al., 2016).

Some studies have examined the mediating roles of behavioral variables and each other, including LMX, mainly using Structural Equation Modeling SEM (See Table 2).

Table 2

Studies in higher education that examined the mediating roles of Behavioral Variables Including LMX

Related results	Studies
"LMX reduces compulsory citizenship behavior and decreases the intention to quit the job" (p.328).	(Çelik & ÖnGEL, 2022).
"LMX fully mediated the relationship between procedural justice and organizational citizenship behavior OCB" (p. 202).	(Ishaq et al., 2012).
There is evidence of how the relationship resources embodied in the LMX between supervisors (leaders) and employees (members) influence employees' perceptions of investment in their development.	(Horne et al., 2016).
"Group membership of innovation teams played a moderating role in the relationship between LMX differentiation and proactive behavior."	(Estel et al., 2019).
"Students' levels of engagement and course satisfaction fully mediated student-LMX and the intention to leave university", in addition to the role of student-LMX in enhancing tertiary student outcomes (p.167).	(Farr-Wharton, et. al., 2018).
LMX, between FM colleague and FM supervisor, was "a significant moderator in the relationship between organizational justice and organizational citizenship behavior" (p. 735).	(Sheeraz et al., 2020).
"Job burnout is a significant variable that mediates" between LMX in developing quality exchange relationships, job design, and counterproductive work behaviors.	(Azam et al., 2022).
There is "moderating role of LMX in the relationship between favoritism as well organizational commitment and nepotism–organizational commitment", and LMX did not moderate the relationship between cronyism and organizational commitment (p. 97).	(Hameed et al., 2020).
"LMX fully mediates the relationship between abusive supervision and intrinsic motivation, intrinsic motivation partially mediates the relationship between LMX and creativity, LMX and intrinsic motivation sequentially mediate the relationship between abusive supervision and individual creativity" (p. 605).	(Meng et al., 2017)
"LMX moderated the relationship between learning value of the job and all employability dimensions" (p. 163).	(Van der Heijden & Spurk, 2019)
"There is a role of LMX quality as a full mediator between leaders' behavior and employees' proactive behavior, between leaders' paternalism and employees' occupational self-efficacy, and between leaders' empowering behavior and employees' personal initiative and resistance to occupational change" (p.215).	(Alshamasi, 2012)
There is mediation between the leader and member relationship and health perception and general satisfaction with life.	(Pauli et. al., 2018)

Other studies have examined the effects of similarities and differences in some variables among leaders and members or between institutions. Ghaus et al. (2018) studied the connection between LMX, gender similarity, and organizational citizenship behaviors OCB, applying a gender perspective to their research in Pakistan's higher education sector. The relationship between LMX and OCB was studied by the authors, with gender similarity acting as a

moderator. The research revealed ambiguous results concerning the moderating impact of gender resemblance on the LMX-OCB correlation between public and private university populations. The study reveals ambiguous outcomes concerning the correlation between gender similarity and LMX. Selekler-Goksen et al. (2016) examined the effect of organizational justice on LMX connections within the Turkish higher education sector. In public universities, Informational justice significantly influences the quality of the leader-member relationship, while procedural justice plays a secondary role. In contrast, in foundation universities, all three dimensions--informational, procedural, and interpersonal-equally impact the quality of the leader-member relationship.

Some studies have examined the effects of LMX differentiation LMXD. For example, Manata (2020) investigated the extent to which task and social cohesion mediated the effects of LMXD on team performance at a large Midwestern university in the USA. The results indicate that the negative effect of LMXD on team performance was mediated by task cohesion but not by social cohesion. Additionally, LMX differentiation was found to negatively affect social cohesion, which was mediated by task cohesion. Furthermore, Estel et al. (2019) found that the relationship was negative for the out-group to LMX differentiation (LMXD), whereas the in-group's proactive behavior was positively related to LMXD.

In all these previous studies and their directions, in conjunction with other studies in different fields that are difficult to enumerate, no effort has been observed to extend LMX across organizational structures. More specifically, no study has simultaneously considered the views of one group to assess their LMX in two directions: toward their leaders (LLX) and their members (LMX). Therefore, the claimed lack of research on vertical relational extension across organizational structures is enhanced in this study. Furthermore, most previous studies have not explored the existence of correlations or differences between the directions of relationships: LLX and LMX.

Method

Sample

The main study population was comprised of 110 DHs at Taibah University, Saudi Arabia. The survey was conducted in May 2019; that time may be early, but this is a study in theory and is not tied to precise time conditions. The DHs were provided with the approval of the Deanship of Scientific Research at the university to conduct the study and reassured them of the confidentiality of their personal opinions and the limitations of the information taken from them for scientific and research purposes only. The entire study population was targeted at the beginning of the study period. However, as expected, not all participants responded. Sixty valid responses were obtained, representing approximately 55% of the total population. Thus, respondents were considered as a random sample (See Table 3).

Table 3

Study Sample

Variable	Value	Frequency	%
Gender of the DH	Male	52	86.7
	Female	8	13.3
Academic rank of the DH	Assistant Professor	41	68.3
	Associate Professor	16	26.7
	Professor	3	5.0
Total of any variable		60	100

Instrument

The LMX-7 scale was chosen in this study from many scales designed for use in LMX theory studies. This choice was based on the recommendations of the theory's pioneers and meta-analyses (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995). However, there is no ideal scale in the humanitarian field; otherwise, there would not be a variety of research scales, and the LMX-7 is no exception, as it has received much criticism.

A comprehensive review of theory, measurement, and data-analytic practices of LMX was conducted by Schriesheim et al. (1999), whose critique of the LMX measuring scales, including the LMX-7, can be summarized as follows: "LMX scales seem to have been developed on an ad hoc, evolutionary basis, without the presentation of any clear logic or theory justifying the changes which were made [and they] have typically not been developed using an a priori theoretical definition of its content subdomains" (p. 100).

Another issue regarding the LMX scale is whether it is a unidimensional or multidimensional construct. In the mid-80s, based on a survey of previous literature, Dienesch and Liden (1986) noted that the exchange between leaders and members had been treated as a multidimensional construct, and an initial set of dimensions had been developed. In the late 1990s, Liden and Maslyn (1998) supported the view that LMX is a multidimensional construct (not unidimensional). Their results provided psychometric support for a multidimensional LMX measure (LMX-MDM).

The LMX-7 scale used in this study has a five-point scale and is a multidimensional scale with three dimensions: respect, trust, and obligation (Graen & Uhl-Bien, 1995). The items of the LMX 7 scale are classified according to the three dimensions as follows: (A) Respect dimension includes items 2 & 3 (B) Trust dimension includes items 4, 5 & 6 (C) Obligation or Commitment dimension includes items 1 & 7 (Graen, 2003).

Permission to use the LMX-7 was initially requested from Dr. Mary Uhl-Bien based on Graen and Uhl-Bien's (1995) study. The LMX-7 was used in the Arabic language based on two procedures:

1) Relying initially on the Arabic version of LMX-7 revised by Graen and Uhl-Bien (1995), which was originally released in "Leadership: Theory and Practice" by Peter G. Northouse, The Institute of Public Administration in Riyadh published this book in Arabic twice, both translated by Dr. Salah M. Al-Ma'youf; in 2006, based on the 2nd English edition (2001), then in 2018, based on the 6th English edition (2013). The latter translation is the one used in this study.
2) The translation was presented to a group of bilingual FMs (Arabic-English) in Saudi. They were asked to criticize and improve the Institute of Public Administration's translation, and minor modifications were made.

Although the LMX-7 is usually used between leaders and subordinates, it can be used by one leader to assess the quality of his/her relationship with the leader and/or subordinate (Northouse, 2016). Accordingly, the LMX-7 was used simultaneously to survey the DHs estimates in two directions. The first direction estimates with CDs as their leaders (LMX-A), and the second estimates with FMs as their subordinates (LMX-B). Accordingly, the third direction (Bi-LMX) was mathematically estimated to represent the arithmetic average of the previous two directions.

Although the LMX-7 has been criticized by Schriesheim et al. (1999), as mentioned earlier, it has been used in many studies worldwide and has received significant praise for its psychometric features (Caliskan, 2015; Gerstner & Day, 1997; Graen & Uhl-Bien, 1995; Hayden, 2011). However, because the LMX-7 was used in Arabic in this study, a review of its psychometric properties as a translated scale is required.

An internal correlation matrix of the translated scale was created twice. First, an inter-item correlation analysis was performed in the direction of LMX-7 with the leader (CD: LMX-A). The first matrix revealed that the correlation between all scale items was statistically significant at a level of .01 (2-tailed), with correlation coefficients ranging between .34 and .83 (See Table 4).

Table 4

Inter-Item Correlation Matrix: LMX-7 with the Leader (CD: LMX-A)

Item	1	2	3	4	5	6	7
1	1	.65**	.73**	.61**	.34**	.68**	.68**
2	.65**	1	.69**	.70**	.52**	.75**	.79**
3	.73**	.69**	1	.63**	.44**	.71**	.70**
4	.61**	.70**	.63**	1	.69**	.75**	.69**
5	.34**	.52**	.44**	.69**	1	.56**	.48**
6	.68**	.75**	.71**	.75**	.56**	1	.83**
7	.68**	.79**	.70**	.69**	.48**	.83**	1

Note. $^{**}p < .01$.

Second, the same analysis was performed for LMX-7 with a member (FM: LMX-B). The second matrix also revealed that the correlation between all the scale items was statistically significant at two-tailed significance levels of 0.01 (2-tailed) and 0.05 (2-tailed), with correlation coefficients ranging between .27 and .71 (See Table 5).

Table 5

Inter-Item Correlation Matrix: LMX-7 with the Member (FM: LMX-B)

Item	1	2	3	4	5	6	7
1	1	.63**	.52**	.49**	.41**	.32*	.43**
2	.63**	1	.66**	.52**	.46**	.32*	.49**
3	.52**	.66**	1	.52**	.43**	.40**	.27*
4	.49**	.52**	.52**	1	.71**	.54**	.45**
5	.41**	.46**	.43**	.71**	1	.50**	.43**
6	.32*	.32*	.40**	.54**	.50**	1	.58**
7	.43**	.49**	.27*	.45**	.43**	.58**	1

Note. $^{**}p < .01$, $^{*}p < .05$.

The Cronbach's alpha was also estimated in two directions for the LMX-7. The first is the direction of LMX-7 with the leader (CD: LMX-A). The general result was Cronbach's alpha for the LMX-7 with the leader =.91 (See Table 6).

Table 6

Cronbach's Alpha: LMX-7 with the Leader (CD: LMX-A)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	24.83	23.22	.71	.91
2	24.50	22.72	.81	.89
3	24.70	23.23	.76	.90
4	24.67	22.63	.82	.89
5	25.22	22.13	.58	.93
6	24.48	23.33	.86	.89
7	24.30	23.87	.82	.90

Note. Scale Statistics: Cronbach's Alpha = .91, Mean = 28.78, Variance = 30.91, Std. Deviation = 5.56

The second direction of Cronbach's alpha of the LMX-7 was with a member (FM: LMX-B). The general result was Cronbach's alpha for the LMX-7 with a member =.86 (See Table 7).

Table 7

Cronbach's Alpha: LMX-7 with a Member (FM: LMX-B)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	23.47	14.82	.62	.84
2	23.28	15.08	.69	.84
3	23.45	15.09	.62	.84
4	23.70	14.55	.74	.83
5	23.98	13.88	.65	.84
6	23.42	16.14	.58	.85
7	23.10	15.95	.57	.85

Note. Scale Statistics: Cronbach's Alpha = .866, Mean = 27.40, Variance = 20.075, Std. Deviation = 4.480

In general, there is only one item (No. 5) in the first direction (LMX-7 with the leader or the CD); deleting it will increase Cronbach's alpha from .91 to .93, but this procedure will violate the short scale that does not bear deletion. However, Cronbach's alpha in this direction was originally high (.91).

Analysis

Owing to the nature of the data obtained, the following were used for the analysis:

(1) Frequencies and percentages to describe the study sample.
(2) An inter-item correlation matrix and Cronbach's alpha to verify the validity of the scale and its characteristics as a translated scale.
(3) The arithmetic mean to estimate the overall LMX relationship (Bi-LMX) as a numeric expression to simultaneously estimate both LMX-A and LMX-B.
(4) Parametric methods to calculate the means and standard deviations of the study scale dimensions and estimate the quality of the LMX relationship.
(5) Nonparametric methods for the study questions related to correlations and differences, namely Spearman's rho correlation coefficient and Wilcoxon Signed Ranks Test.

The latest two were because most of the sample data do not follow a normal distribution, as shown by the Tests of Normality (See Table 8).

Table 8

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df.	*p*	Statistic	df.	*p*
Trust-A	.15	60	.001	.89	60	<.001
Trust-B	.15	60	<.001	.95	60	.037
Respect-A	.19	60	<.001	.84	60	<.001
Respect-B	.19	60	<.001	.90	60	<.001
Commitment-A	.23	60	<.001	.84	60	<.001
Commitment-B	.15	60	.001	.91	60	<.001
LMX-A	.14	60	.002	.89	60	<.001
LMX-B	.10	60	.083	.96	60	.081

a. Lilliefors Significance Correction

The statistical significance level used in this was initially set at .05; however, a more accurate level was considered. Statistics were calculated using IBM SPSS version 29.0.

Results

The study questions branch out in several directions from the study problem question; thus, the results are presented below question-by-question.

Q1. "What are the levels of LMX-A, LMX-B, and Bi-LMX estimated by the DHs?"

Table 9 shows that the Commitment-A dimension had the highest mean, followed by the Respect-A dimension, followed by Commitment-B dimension. The dimensions with the lowest means were Trust-A, LMX-B, and Trust-B. While the means of LMX-A and Respect-B dimensions are in the middle.

Table 9

Levels of LMX-A, LMX-B, and Bi-LMX

Dimension	*M*		*SD*
	Statistic	Std. Error	Statistic
Trust-A	3.99	.11	.90
Trust-B	3.70	.09	.74
Respect-A	4.18	.11	.85
Respect-B	4.03	.09	.76
Commitment-A	4.21	.10	.81
Commitment-B	4.11	.09	.71
LMX-A	4.11	.10	.79
LMX-B	3.91	.08	.64
Bi-LMX	4.01	.07	.60

N= 60

Q2. "Is there a significant correlation between LMX-A and LMX-B?"

Table 10 shows that there is a statistically significant value, at a significance level of 0.01, for the correlation coefficient between every two corresponding subdimensions (A, B) in the LMX of the DHs with the CD and with the FM, and at all three dimensions levels. With the statistical significance of these correlation coefficients, the value of the correlation coefficient at subdimensions did not reach .5, but it is sufficiently evident that there is a significant positive correlation and no negative correlation for subdimensions in both directions of the relationship. In any case, the correlation coefficient at the general LMX level exceeds .5.

Table 10

Nonparametric Correlations / Spearman's rho of LMX-A and LMX-B

Dimension	N	Correlation Coefficient	*p* (2-tailed)
Trust-A & Trust-B	60	.48**	<.001
Respect-A & Respect-B	60	.37**	.003
Commitment-A & Commitment-B	60	.47**	<.001
LMX-A & LMX-B	60	.51**	<.001

Note. $^{**}p < .01$.

Q3. "Is there a significant difference between LMX-A and LMX-B? in which dimensions?"

Table 11 shows a statistically significant difference at a significance level of .003 in the Trust dimension between Trust-A and Trust-B, indicating that Trust with the CD outweighs Trust with the FM. It also shows a statistically significant difference at a significance level of 0.006 between LMX-A and LMX-B, which means that the general quality of LMX with the CD outweighs the quality of LMX with the FM.

Table 11

Wilcoxon Signed-Ranks Test of (LMX-B) – (LMX-A)

Ranks					Wilcoxon test	
		N	Mean Rank	Sum of Ranks	Z*	Asymp. Sig. (2-tailed)
(Trust-B) - (Trust-A)	Negative Ranks	35	26.00	910.00	-2.97	0.003
	Positive Ranks	14	22.50	315.00		
	Ties	11				
	Total	60				
(Respect-B) - (Respect-A)	Negative Ranks	31	20.94	649.00	-1.83	0.067
	Positive Ranks	13	26.23	341.00		
	Ties	16				
	Total	60				
(Comm.-B) - (Comm.-A)	Negative Ranks	27	21.81	589.00	-1.43	0.151
	Positive Ranks	16	22.31	357.00		
	Ties	17				
	Total	60				
(LMX-B) – (LMX-A)	Negative Ranks	40	26.45	1058.00	-2.72	0.006
	Positive Ranks	14	30.50	427.00		
	Ties	6				
	Total	60				

Discussion

Q1. The results presented in Table 9 indicate that the LMX may reach a "high" level through the defined vertical extension across the UOS. In terms of classification, if the middle of the scale is considered the boundary between the in-group and out-group, this result may indicate the predominance of in-groups through the defined vertical extension across the UOS at the expense of out-groups.

This result is consistent with Alshamasi's (2012) findings regarding the LMX level in the higher education context, where the LMX level reached "high" but not "very high." However, the distinctions between Alshamasi's (2012) study and the present study should be noted. Alshamasi's (2012) study involved mixed participants (including academics and non-academics), conducted a survey in two directions, and used the 12-item LMX-multidimensional or LMX-MDM scale introduced by Liden and Maslyn (1998).

Globally, when comparing previous studies' results in higher education with those of this study, the following should be considered: (1) comparison with studies whose reports clearly included the mean of LMX relationships, (2) diversity of measuring scales as they were LMX-7 or LMX-MDM; (3) diversity of the scale points as they were five or seven points, and (4) parties of LMX relationship, where there was a wide diversity not limited to FMs and DHs but extended to students, researchers, their assistants, and employees (See Table 12).

Table 12

LMX levels in Higher Education in Diverse Countries

Country	Study	Perspective (population/ sample)	Scale	Points	Mean
USA	(Jacques et al., 2012)	Students and teachers	LMX-7	5	3.34
	(Sollitto et al., 2016)	Part time students and supervisors	LMX-7	5	3.57 – 4.10
	(Hanley et al., 2024)	FM and DH	LMX-7	5	3.76
	(Pellegrini et al., 2010)	Working professionals in an executive MBA	LMX-MDM	7	5.19
	(Matta et al., 2015)	Students in a junior-level management course and supervisors	LMX-MDM	5	4.11-4.26
	(Hayden, 2011)	Subordinate and supervisor	LMX-7	5	(Multi)*
Turkey	(Selekler-Goksen et al., 2016)	Full-time faculty and superiors	LMX-7	5	21.57-23.21**
	(Dal & Çorbacioğlu, 2014)	Academics and DHs	LMX-MDM	5	3.80-3.98
	(Çelik & Öngel, 2022)	FMs/ employees and superiors	LMX-MDM	5	4.0147
Pakistan	(Ishaq et al., 2012)	FMs (Permanent or contracted) and superiors	LMX-7	5	3.50
	(Sheeraz et al., 2020)	FMs and direct supervisors	LMX-7	5	3.63
	(Raza, 2021)	Teachers and DHs	LMX-7	7	5.91
	(Azam et al., 2022)	Employees in public sector universities	LMX-MDM	5	3.97
	(Hameed et al., 2020)	Employees in different public sector universities	LMX-MDM	5	3.76
	(Ghaus et al., 2018)	FMs and their superior	LMX-MDM	5	(61.38-66.62)***
Indonesia	(Wijaya, 2019)	Alumni of a college	LMX-7	5	3.72
	(Waskito et al., 2020)	Non-permanent lecturers	LMX-7	7	5.82
China	(Zhao et al., 2021)	Postgraduate students and supervisors	LMX-7	5	3.65
Germany	(Estel et al., 2019)	Doctoral students, research assistants, supervisors and assistant professors	LMX-7	5	4.01
Australia	(Farr-Wharton et al., 2018)	First- and second-year undergraduate students and lecturers	LMX-7	5	4.2605
Brazil	(Pauli et al., 2018)	Teachers and leaders	LMX-7	7	5.53
India	(Pellegrini et al., 2010)	Working professionals enrolled in an executive MBA program	LMX-MDM	7	4.86
Peru	(Brown et al., 2019)	Practitioners studying graduate, executive education, professional and management development	LMX-7	5	3.79
Chain	(Meng et al., 2017)	Postgraduates and academic supervisors	LMX-7	5	3.68
Netherlands	(Van der Heijden & Spurk, 2019)	Academic staff employees	LMX-7	5	3.31
South Africa	(Horne et al., 2016)	Academic staff members	LMX-7	5	3.58

Note. *- 22 pairs, and the level of LMX was: Very High (11 pairs), High (7 pairs), Medium (2 pairs), Low (2 pairs). **- Evaluation based on the average of the scale score in one direction. ***- Evaluation based on the average of the scale score in two directions.

Table 12 shows that the level of LMX in this study is consistent with those reported in many studies around the world in terms of being mostly high, with some exceptions at a level above high (Farr-Wharton et al., 2018; Matta et al., 2015), or below high (Ghaus et al., 2018; Jacques et al., 2012; Selekler-Goksen et al., 2016; Van der Heijden & Spurk, 2019), although the variation from a high level is not by far. All of these studies, in synergy with this study, may be sufficient to judge the existence of LMX as high-quality in a higher education context and, thus, the predominance of in-groups in various categories, such as administrative, academic, students, or researchers. Additionally, this result may call for a sub-result, namely, that the

multiplicity of LMX scales in their subdimensions or scales between 5 and 7 points may lead to convergent results when used in one field (e.g., higher education).

In the case of Saudi Arabia, Alshamasi (2012) interpreted this high level of LMX quality in higher education from a collectivistic-society values perspective by attributing it to factors of brotherhood and ties of friendship and family, as Arabic society dates back to Arab tribe formations and Islam that are culturally similar to other non-Arab Eastern collectivistic societies, such as Malaysia, Turkey, and China. However, given two aspects, this interpretation may be inaccurate. First, the in-group in LMX theory does not address collaborative teamwork, whereby it would be assumed that there is a collective culture among its members, but rather that it is a group of unique and special isolated pairs of dyad relations between leaders and their members. Second, there has been an increase in the quality of LMX in higher education contexts worldwide, including Western cultures, as evidenced by the cross-cultural results presented in Table 12.

However, this does not mean that there is no out-group, which is clear from the lack of moderation in the distribution presented in Table 8. Hence, a question arises: "Are there members who are not willing to be members of the in-group and thus prefer to remain in the out-group for any reason?"

Q2. The results presented in Table 10 indicate that LMX-A affects LMX-B through the defined vertical extension across the UOS. Moreover, this might indicate that relationship quality improvement in the downward direction (LLX: from dean to DHs) may ensure improvement in the other downward direction (LMX: from DHs to staff members). This result is supported by returning to the result of Question 1 (Table 9), where the level of the relationship in the LMX-A direction consistently surpasses that of the LMX-B, both overall and across subdimensions.

Additionally, it can be concluded that the Trust dimension is the largest contributor to the relatively high correlation coefficient at the general level, as the Trust correlation coefficient is 0،482 which implies its dominance over the other two subdimensions—respect and commitment.

Q3. The results presented in Table 11 indicate that Trust-A in the UOS is higher than that of Trust-B. This result may be attributed to the fact that the use of the LMX-7 in this study focused on one person in the LMX-A direction, while there was more than one person in the direction of LMX-B, and the respondent (DH) had to choose one of them. This may be because position power is stronger in the LMX-A direction than in the LMX-B direction, which indicates that trust in the UOS is higher when the position is higher or more powerful. The difference between the two directions of LMX may have been affected by the difference in the trust dimension, which may enhance the previous result (Question 1) that the Trust dimension is dominant over the other two subdimensions—respect and commitment.

This result can be interpreted as CDs and DHs are more concerned with favorable organizational outcomes to which LMX quality is correlated (Caliskan, 2015). In contrast, FMs are less concerned with developing close relationships with the DH and more independent (McArthur, 2002; Taylor, 1992). Thus, throughout the UOS, when the relationship is more administrative (DHs with CDs in this case), the LMX relationship is stronger and in the dimension of trust compared to when it is more technical (DHs with FMs in this case).

In this regard, it should not be forgotten that the relationship between DHs and CDs is an LLX relationship, as opposed to the LMX relationship with the FM. Therefore, leaders who are trusted by their leaders can invest trust in their members (Herdman et al., 2017), which can be interpreted as the DHs enhancing trust between them and the CDs, while trust with the FMs is expected as a result of the former.

The significant difference in the Trust dimension enhances the consideration of LMX as a multidimensional construct that should not be treated as a unidimensional construct (Dienesch & Liden, 1986; Liden & Maslyn, 1998).

Conclusion

This study aimed to fill research gaps in the LMX literature by understanding the synergy of multiple and extended LMX relationships through a vertical extension within UOS. It investigated the LMX levels, correlations, and differences between the two directions of DHs' LMX (with CDs and FMs simultaneously). Using the LMX-7 scale in a Saudi university from the DHs perspective, the study concluded the following. (1) LMX quality within the UOS is high, and there is a predominance of in-groups through the defined vertical extension across the UOS at the expense of out-groups. (2) LMX of DHs with CDs correlates statistically to their LMX with FMs. (3) DHs' trust in CDs is higher than trust in FMs. (4) The trust dimension is dominant over the other two dimensions of LMX—respect and commitment.

Although the nature of dyads in the field of higher education differs from that in many other fields, higher education represents an ideal ground for the study of LMX, and the research being conducted in it improves the leadership process in most other fields because leaders, as human resources, come from this field and are developed based on its production of knowledge regarding leadership. Thus, some theoretical implications of LMX studies can be provided and other practical implications of higher education.

Theoretical Implications

Although this study has been applied to the field of higher education, it originates from the LMX theory framework; therefore, its results may enrich the literature on this theory as follows.

First, it bridges the gap resulting from the separation in LMX studies between administrative and human structures and understands the relational extension through the organizational structure of LMX dyads, which may be a new direction in the LMX literature.

Second, viewing LMX relationships as isolated dyads keeps studies of this theory deprived of a new direction that views LMX relationships as a synergistic series of potentially similar or diverse dyads, influences, and correlations, thus depriving the theory of contributing to the formation of an integrated picture of the phenomenon of leadership this study aimed to address.

Third, organizational structure performance can be improved by taking advantage of LMX studies and supporting the normative/directive direction of this theory while simultaneously highlighting the purely administrative dimensions that affect it.

Fourth, this study supports the validity of Herdman et al.'s (2017) assumption that the LLX relationship impacts the LMX relationship.

Fifth, the multiplicity of LMX scales in their subdimensions or scales between five and seven points may lead to convergent results when they are used in one field - higher education in this study.

Finally, the results revealed a difference in trust level as a subdimension of the LMX-7 scale between the two relationship directions of the intermediate leader, which supports the (Liden & Maslyn, 1998) view that the LMX relationship is multi-dimensional.

Practical Implications

This study was conducted at a Saudi university with a professional bureaucratic structure according to the Mintzberg (1979) classification, which applies to most universities around the world. This study focuses on the DHs who are in intermediate positions and studied their LMX relations simultaneously in two directions, up with the CDs and down with FMs, and produced the results mentioned previously; thus, some practices can be provided in the field of higher education.

First, guide intermediary positions in the UOS, DHs principally, that their relationships with their leaders are reflected in their relationships with their members, particularly in the dimension of trust, to further improve the network of relationships throughout universities' UOS.

Second, providing DHs with LMX scales and training them to conduct action research on periodic evaluation and continuous improvement of their relationships in various organizational directions and with the various groups they deal with (deans, colleagues, administrative assistants, researchers, students, and the community), and confidentiality regarding the identities of participants is recommended to avoid inappropriate behaviors in academic life, such as hypocrisy.

Limitations and Suggestions for Future Research

The following points should be considered when interpreting the results of this study or building upon them in future research.

First, this study is descriptive and cross-sectional, but the LMX relationship is subject to changing over time. Therefore, it is appropriate to support the recommendation of Alshamasi (2012) to study the effect of time on LMX relations across the UOS throughout the service in academic positions.

Second, although this study examined LMX relationships in terms of the correlation of its directions across the UOS, it did not address the possibility of predicting a level of LMX direction by evaluating its another direction; thus, using regression methods seems useful.

Third, this study was based on a purely quantitative approach, so its results may be ambiguous in terms of previous interpretations. Therefore, there is a need to take advantage of the qualitative approach, as recommended by Alshamasi (2012).

Fourth, although the results of this study are consistent with the results of previous studies in terms of the high level of LMX relationships in academia and the prevalence of in-groups at the expense of out-groups with the existence of some members in the out-group, this study produced a question, which is: "Are there members who are not willing to be members of the in-groups and thus prefer to remain in the out-groups for any reason?"- This question requires further research.

Fifth, although this study showed that the quality of LMX with the leader (LLX) positively affects the quality of the same relationship with the member, but this is in a downward direction,

and another question may emerge that requires further research which is: "Is the high-quality LMX of the leaders with their members reflected in a similar quality with their leaders (LLX)?"

Sixth, there are extensions across the UOS, such as university presidents and vice presidents (but they are not limited to these). Further research is required to gain a more comprehensive understanding of how LMX relationships extend throughout the UOS.

Finally, this study was limited to academic members of the UOS; however, there are other non-academic individuals in addition to students; hence, more studies are needed to address LMX across structural extensions that encompass such categories.

Declarations

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This study is approved by all tacitly or explicitly responsible authorities, participants and all parties related where the study was carried out.

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