

Leader Member Exchanges: Distinction Between Two Factors

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The dimensionality of Graen's Leader Member Exchange concept was examined in a cross-sectional questionnaire study among 1147 Dutch nurses. The total sample was divided into two subgroups by means of stratified random selection ($n_1 = 574$; $n_2 = 573$) and analyses were performed in each subgroup separately. The factorial structure of a 12-item self-report Leader Member Exchange questionnaire was examined. Exploratory factor analysis on the data of subgroup 1 yielded two factors, which were labelled "consideration/coaching by the leader" and "filling an assistant position". Confirmatory factor analyses with LISREL showed that a two-factor oblique model had the best fit in both subgroups. Equality of factor structures in both subgroups was clearly demonstrated. Differential validity of the two Leader Member Exchange factors was studied by correlating each factor with measures of job-related affect. In both subgroups, the consideration/coaching factor had a significantly stronger, positive relationship with job satisfaction and a significantly stronger, negative relationship with propensity to quit the job, whereas the assistant position factor had a significantly stronger, positive relationship with job-responsibility. Results concerning the relationships with effectiveness ratings were inconclusive. The results of this study indicate that the Leader Member Exchange concept is two-dimensional rather than unidimensional.

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INTRODUCTION

Since the early 1950s, numerous studies have been conducted on the effects of leadership behaviour. The best-known are the Ohio State leadership studies (Stogdill and Coons, 1957), which have dominated questionnaire research on effective leadership behaviour for decades. This research programme reached the conclusion that leadership behaviour could best be described as varying along two dimensions or "styles". One style was labelled "consideration", reflecting the degree to which a leader acts in a friendly and supportive manner, shows concern for his or her subordinates, and looks out for their welfare. The other style was named "initiating structure", reflecting the degree to which a leader defines and structures his or her own role and the roles of subordinates towards attainment of the group's formal goals.

A second major programme of research on leadership behaviour was carried out by researchers at the University of Michigan at approximately the same time as the Ohio State leadership studies. The results from these studies were summarized by Likert (1961, 1967). This research programme made a distinction between three types of leadership behaviour. The first two types strongly resembled the Ohio State styles, and were labelled "relationship-oriented behaviour" and "task-oriented behaviour". The third style was named "participative leadership behaviour", and involved the use of decision procedures intended to allow other people some influence over the leader's decisions.

In both research programmes, it is implicitly assumed that a leader behaves in the same way towards different subordinates. Therefore, theories on leadership behaviour have been tested by computing average leadership scores per work group, and by looking at overall correlations between these average leadership scores and measures of subordinate performance or subordinate affect. However, the results from these two research programmes, and those of more recent studies which have been conducted along similar lines, are inconsistent and inconclusive with respect to the effects of certain leadership styles. Only the consideration style was found to be related consistently to subordinate satisfaction (Yukl, 1989).

The assumption that leaders treat all their subordinates alike may be the main reason why many traditionally structured studies of leadership style have yielded inconsistent results. Although individual group members sometimes agree on perceptions of their leader's behaviour (Mulder, de Jong, Koppelaar, & Verhage, 1986), this does not imply that differences in perceived leadership behaviour between different subordinates of a leader are not worth studying. Moreover, everyday practice in organizations clearly shows that leaders do differentiate between their subordinates with respect to their leadership behaviour. Based on this notion, Graen and colleagues developed their Vertical Dyad Linkage theory of leadership (Dansereau, Graen, & Haga, 1975), which is nowadays called Leader Member Exchange theory (LMX theory). This theory describes how leaders use their position power to develop different exchange relationships with different

subordinates. The basic premise of the LMX theory is, that leaders establish special relationships with a small number of trusted subordinates (the so-called "in-group"), who function as their assistants. The basis for these special relationships is the leader's control over desirable outcomes. In return for greater status, more influence, and extra benefits, in-group subordinates are expected to work harder, to be more committed to their tasks, and to be loyal to the leader. This type of LMX relationship is designated "high quality" relationship.

The exchange relationships established with the remaining subordinates (classified as the "out-group") are substantially different. In these exchange relationships there is a relatively low level of mutual influence. Out-group subordinates need only fulfil formal job requirements. As long as they comply, these subordinates receive the standard benefits, primarily payment, for the job. This type of LMX relationship is called a "low quality" relationship.

The LMX relationship can thus be regarded as the exchange of desirable outcomes between a leader and an individual subordinate (greater status, more influence, and extra benefits in exchange for assisting and taking over some of the tasks of the leader). Early studies on the LMX theory (Dansereau et al., 1975; Graen & Cashman, 1975) used a median-split procedure to determine the in-group status or out-group status of subordinates. Subordinates with an LMX score above the median are identified as in-group and subordinates with a score below the median are designated out-group. This median-split procedure has been severely criticized by numerous authors (for example Vecchio & Gobdel, 1984), and treatment of the Leader Member Exchange concept as a continuous variable has been recommended. According to this line of thought, a higher score on the continuum indicates a higher quality of the LMX relationship. In several studies on the LMX theory it was found that a higher quality of the LMX relationship leads to more favourable outcomes, in terms of more job satisfaction (Deluga & Perry, 1991; McClane, 1991; Rosse & Kraut, 1983; Vecchio & Gobdel, 1984), less turnover (Ferris, 1985; Graen, Liden, & Hoel, 1982; Vecchio & Gobdel, 1984), and a more positive evaluation of organizational climate (Kozlowski & Doherty, 1989).

Two aspects of an LMX relationship can be distinguished: (1) personal attention to the subordinate and coaching of the subordinate's career by the leader; and (2) assistance of the leader by the subordinate. Although these two aspects of the exchange process are mentioned in the original LMX theory, the quality of the LMX relationship is usually assessed using a single measure. Recently, this single LMX measure has been found to be related to both consideration and initiating structure (Norris & Vecchio, 1992). The unidimensionality of the LMX concept has been questioned by Dienesh and Liden (1986). However, until now no studies have been carried out focusing on the dimensionality of the LMX concept. In this article we want to test the proposition that a distinction should be made between the two above-mentioned aspects of the LMX relationship, instead of combining them into a single measure. Based on a content analysis of a 12-item version of the LMX questionnaire, we hypothesized that the Leader Member Exchange concept

would be two-dimensional rather than unidimensional. The two hypothesized dimensions relate to the contribution of the leader (personal attention, coaching) and the contribution of the subordinate (taking over tasks and responsibilities) to the LMX relationship.

The following research questions were formulated:

1. Does the 12-item Leader Member Exchange questionnaire have a one-factor or a two-factor structure?
2. If a two-factor structure is found, do these two factors have differential relationships with measures of job-related affect?

The first question concerns the factor structure of the 12-item Leader Member Exchange questionnaire, whereas the second question relates to the differential validity of the factors.

In the remaining part of this article we first describe the sample and the method of data collection. Then, the measures, analyses, and results with respect to research question 1 will be presented (Part 1). This is followed by the presentation of measures, analyses, and results with respect to research question 2 (Part 2). The article concludes with a general discussion. Descriptive statistics for the questionnaire scales and ratings used in Part 1 and Part 2 are given in Table 1.

SAMPLE AND METHOD OF DATA COLLECTION

Sample

The subjects of the present study were part of a sample of 1561 nurses and nurse trainees working in 16 general and 2 academic hospitals in the Netherlands. The subjects were employed in 95 normal-care wards. Nurse trainees were excluded from the analyses; furthermore nurses with missing values on any of the variables were also excluded from the analyses. The final sample therefore consisted of 1147 nurses; 982 (85.6%) were women, 165 (14.4%) were men. Ages ranged from 19 to 59 years ($m = 31.9$, $SD = 7.9$).

TABLE 1
Descriptive Statistics and Alpha Coefficients for the Questionnaire Scales

<i>Scale/Rating</i>	<i>n of items</i>	<i>Range</i>	<i>M</i>	<i>SD</i>	<i>alpha</i>
Consideration	6	6-30	18.66	4.93	0.86
Assistant position	6	6-30	21.78	4.16	0.80
Satisfaction	6	7-30	23.53	4.09	0.83
Responsibility	1	1-5	4.22	0.86	--
Effectiveness of unit	1	1-5	3.76	0.87	--
Effectiveness of self	1	1-5	3.99	0.65	--
Propensity to quit	5	5-25	12.91	5.69	0.86

To enable cross-validation, the sample was divided into two subgroups by means of stratified random selection ($n_1 = 574$; $n_2 = 573$). The subgroups were stratified by ward; within wards subjects were randomly allocated to one of the subgroups. Subgroup 1 consisted of 491 women and 83 men, with ages ranging from 19 to 58 years ($m = 32.13$; $SD = 8.36$); subgroup 2 consisted of 491 women and 82 men, with ages ranging from 19 to 59 years ($m = 31.71$; $SD = 7.91$).

Procedure

Eighteen hospitals were asked to participate in this study. These hospitals were selected from the total group of hospitals in the Netherlands in such a way that: (1) the sample included both academic and general hospitals; and (2) the hospitals were evenly distributed across the Netherlands (to prevent regional influences). Within these 18 hospitals, all normal-care wards were asked to take part in the study; 95 wards (37%) agreed to participate. Meetings were arranged with the head nurses of these 95 wards to explain the purpose of the research project. During these meetings the head nurses were given letters to inform their nursing staff about the project. Anonymity was guaranteed. Three weeks after the meeting, questionnaires were sent to the nursing staff of the wards involved in the project. As participation was voluntary, nurses could decide for themselves whether or not to fill in the questionnaire. The questionnaire could be completed during shift or at home, whichever was preferred by the nurse. The response rate was 69%.

PART 1: FACTOR STRUCTURE OF THE LMX QUESTIONNAIRE

Measures

A 12-item version of the Leader Member Exchange questionnaire was translated into Dutch (Le Blanc, 1994). Respondents were asked to rate how often they/the head nurse behaved in a way described by the item in question. The items were rated on 5-point Likert scales, ranging from "never" to "always".

Analyses

A three-step procedure was followed to examine the factor structure of the 12-item version of the Leader Member Exchange questionnaire.

1. An exploratory factor analysis was performed on the data of subgroup 1. An item was assigned to a factor if both its loading on that respective factor was higher than 0.35 and its loading on other factors was lower than 0.35 (Nunnally, 1978).

2. Confirmatory factor analysis was performed, using LISREL VII (Jöreskog & Sörbom, 1989). Three alternative factor models were specified in advance: (1) a one-factor model (M_1); (2) a two-factor oblique model (M_{2ob}); and (3) a two-factor orthogonal model (M_{2or}). The two factors of model M_{2ob} and model M_{2or} were specified in advance as follows: items reflecting the leader's contribution to the LMX relationship were assigned to the first factor, whereas items reflecting the subordinate's contribution to the LMX relationship were assigned to the second factor. The relative fit of each model was assessed and compared in each subgroup separately. This approach minimizes capitalization on chance in two ways: (1) by using two samples, thereby enabling cross-validation of models (Cudeck & Browne, 1983); and (2) by using *a priori* specified alternative models instead of data-driven models (McCallum, Roznowski, & Necowitz, 1992). Each of these alternative models was compared with the most restrictive model—the null model (M_0). In this model, there are as many uncorrelated factors as there are items. As a measure of incremental fit of an alternative model, the Tucker–Lewis Index (TLI; Tucker & Lewis, 1973) was computed. This measure is preferable to the absolute chi-square goodness-of-fit index because the latter is substantially affected by sample size whereas the TLI is relatively independent of sample size (Marsh, Balla, & McDonald, 1988). Moreover, we were specifically interested in the increment in fit of a model, rather than in its absolute fit. There are no strict criteria to test the significance of the TLI, but Bentler and Bonett (1980) suggested that a TLI lower than 0.90 indicates that a model can be improved substantially. The best fitting model was determined by inspecting the values of the TLI for the alternative models in both subgroups.

3. Equality of factor structures was tested (Jöreskog & Sörbom, 1989). The absolute fit (chi-square goodness-of-fit index) of the following models were compared across the two subgroups: (1) a model in which the number and pattern of factors are equal across both subgroups (model A); (2) model A with the additional constraint that the factor loadings are equal across both subgroups (model B); (3) model B with the additional constraint that the error variances are equal across both subgroups (model C); (4) model C with the additional constraint that the covariance matrices of the factors are equal across both subgroups (model D). The difference in fit between: (1) model A and model B; (2) model A and model C; (3) model A and model D was computed. If the difference in chi-square between models was not significant, the hypothesis of equality was accepted (Schaufeli & van Dierendonck, 1993). Finally, the equality of the covariance matrices of the raw data across both subgroups was tested (model E).

Results

The exploratory factor analysis on the LMX data of subgroup 1 yielded a two-factor structure. Items and factor loadings are shown in Table 2. With the exception of item 6, all items could be assigned to a factor in accordance to the criteria of

TABLE 2
Exploratory Factor Analysis for Subgroup 1 ($n = 574$)

Item	Loadings	
	Factor 1	Factor 2
1. My boss lets me know how satisfied he/she is with my work	0.71*	0.16
2. My boss understands my job problems/needs	0.80*	0.19
3. My boss recognizes my potential	0.79*	0.29
4. My boss uses his/her power to help me solve problems in my work	0.77*	0.21
5. In case of problems, my boss "bails me out" at his/her expense	0.69*	0.20
6. I defend and justify the decisions of my boss if he/she is not present to do so	0.41	0.60†
7. My boss can count on me to make the same decisions as he/she would	0.33	0.55†
8. My boss is investing in my career	0.64*	0.21
9. In emergency situations, my boss can count on me to complete an assignment he/she started	0.09	0.78†
10. I share my good ideas with my boss	0.34	0.68†
11. I am open to suggestions of my boss regarding my work	0.22	0.67†
12. My boss counts on me to be available when he/she needs me to provide necessary information and support	0.07	0.67†

* assigned to factor 1; † assigned to factor 2.

Nunnally (1978). It was decided to assign item 6 to factor 2, as it had the highest loading on factor 2 and because it fitted with the other items belonging to factor 2 as regards content. The two-factor structure could easily be interpreted. Factor 1 was labelled "consideration and coaching by the leader", including: paying

TABLE 3
Comparison of LMX Factorial Models

Model	χ^2	df	P	GFI	TLI
Subgroup 1; $n = 574$					
M_0	2763.05	66	0.0	0.37	—
M_1	536.96	54	0.0	0.84	0.78
M_{2ob}	271.13	53	0.0	0.92	0.90
M_{2or}	521.00	54	0.0	0.88	0.79
Subgroup 2; $n = 573$					
M_0	2976.22	66	0.0	0.34	—
M_1	536.27	54	0.0	0.84	0.80
M_{2ob}	283.78	53	0.0	0.92	0.90
M_{2or}	577.71	54	0.0	0.87	0.78

GFI, goodness-of-fit index; M_0 , null model; M_1 , one-factor model; M_{2ob} , two-factor oblique model; M_{2or} , two-factor orthogonal model; TLI, Tucker-Lewis index.

attention to the job-related problems and job-related needs of the subordinate, investing in the subordinate's career, helping to solve job-related problems, and giving performance-related feedback to the subordinate. Factor 2 was best described by the term "filling an assistant position" and contained items about investing extra work effort, being available in emergency situations, and thinking along with the leader about important issues.

The values of Cronbach's alpha are 0.86 for factor 1 and 0.80 for factor 2, thereby exceeding the criterion of 0.70 set by Nunnally (1978).

The results of the confirmatory factor analyses are reported in Table 3, in which the fit of the three *a priori* specified models is shown for both subgroups. These results clearly indicate that a two-factor model has a better relative fit than a one-factor model in both subgroups. The best relative fit is found for the two-factor oblique model. The intercorrelation between the factors was 0.58 in subgroup 1 and 0.61 in subgroup 2.

Table 4 summarizes the results with respect to the test of equality of factor structures. As the *P* values of the differences in fit are all non-significant, it can be concluded that the factor structure is invariant across subgroups. The value of chi-square for model E is also non-significant. This means that the covariance matrices of the raw data do not differ significantly across subgroups.

PART 2: RELATIONSHIPS WITH JOB-RELATED AFFECT

Measures

Besides the Leader Member Exchange questionnaire, subjects filled in questionnaires about their job-related affect and their mental and physical health. The following analyses were performed on a subset of the dependent variables, namely those that assess job-related affect. Therefore only these dependent variables are described below.

TABLE 4
Test of the Equality of Factor Structures
(*n*₁ = 574; *n*₂ = 573)

<i>Model</i>	Chi^2_{Group1}	Chi^2_{Group2}	Chi^2_{tot}	P_{tot}	ΔChi^2	<i>df</i>	<i>p</i> Δ
Model A	271.13	283.78	559.91	0.0	—	—	—
Model B	279.59	291.81	571.40	0.0	16.49	10	<i>ns</i>
Model C	288.01	299.49	587.50	0.0	32.60	22	<i>ns</i>
Model D	289.19	300.68	589.87	0.0	34.96	25	<i>ns</i>
Model E	45.36	42.82	88.18	0.2	—	—	—

See text for definitions of Models A–E.

ns = non-significant (*p* > 0.05)

Job Satisfaction. The six items of this scale were taken from a study by Boumans (1990). Exploratory factor analysis demonstrated that all items loaded on one factor. The items assess general, intrinsic job satisfaction. Respondents were asked to rate the extent to which they agree with certain statements about the job on 5-point Likert scales, ranging from “totally disagree” to “totally agree”. For example: “I get a lot of satisfaction from my work”.

Job responsibility. Respondents were asked to rate the extent to which they agreed with the following statement:

“I feel personally responsible for doing my job well”.

This item was rated on a 5-point Likert scale, ranging from “totally disagree” to “totally agree”.

Effectiveness. Respondents were asked to rate the extent to which they agree with the following statements:

“The functioning of my unit as a whole is effective”

“My functioning in my job is effective”.

The items were rated on 5-point Likert scales, ranging from “totally disagree” to “totally agree”.

Propensity to quit the job. This 5-item questionnaire was developed by Zwaga (1983) and assesses the inclination to resign. Factor analysis yielded a one-factor structure. Respondents were asked to rate the extent to which they agree with statements about leaving the organization, looking for a new job, and so on, on 5-point Likert scales, ranging from “totally disagree” to “totally agree”. For example: “I sometimes think of quitting this job”.

Analyses

To establish the differential validity of the two LMX factors, Pearson's Product Moment Correlations for the two LMX factors with all dependent variables were computed separately for each subgroup. After that, the significance of the difference between the two correlation coefficients was determined for each dependent variable. This was done by performing *t*-tests for differences between two correlation coefficients coming from the same sample (Ferguson, 1966, pp. 188–189). Each *t*-test was performed twice, both in subgroup 1 and in subgroup 2.

Results

The correlation coefficients between the two LMX factors and the dependent variables in each subgroup are reported in Table 5. Different correlational patterns between the two LMX factors and the dependent variables were found. The patterns are similar for both subgroups.

Visual inspection of the differences in correlation coefficients for each dependent variable revealed that the consideration and coaching factor had relatively higher correlations with job satisfaction, propensity to quit the job, and with ratings of the effectiveness of the unit as a whole, while the assistant position factor had relatively higher correlations with job responsibility and ratings of one's own effectiveness. To determine whether or not these differences in correlation coefficients were based on chance, *t*-tests on the significance of these differences were carried out for each dependent variable in each subgroup. Table 6 gives an overview of the results of the *t*-tests.

The results reported in Table 6 show that in both subgroups the consideration and coaching factor had a significantly stronger, positive relationship with job

TABLE 5
Correlations of the Two LMX Factors with Measures of Job-related Affect

<i>LMX factor</i>	<i>SAT</i>	<i>RES</i>	<i>EFU</i>	<i>EFS</i>	<i>PQJ</i>
Subgroup 1; <i>n</i> = 574					
Consideration	0.26***	0.5	0.20***	0.13***	-0.18***
Assistant position	0.15***	0.15***	0.10**	0.17***	-0.10**
Subgroup 2; <i>n</i> = 573					
Consideration	0.22***	0.04	0.21***	0.06*	-0.10**
Assistant position	0.12**	0.12**	0.17***	0.12**	-0.01

EFS, effectiveness of self; *EFU*, effectiveness of unit; *PQJ*, propensity to quit job; *RES*, Job-responsibility; *SAT*, Job satisfaction;
p* = 0.05; *p* = 0.01; ****p* = 0.001.

TABLE 6
t-values of the Difference in Correlation Coefficients Between the Two LMX Factors and Measures of Job-related Affect (*n*₁ = 574; *n*₂ = 573)

<i>Variable</i>	<i>Subgroup</i>	
	<i>1</i>	<i>2</i>
Satisfaction	2.97**	2.75**
Responsibility	2.63**	2.16*
Effectiveness unit	2.68**	1.11
Effectiveness self	1.05	1.65*
Propensity to quit	2.12*	2.46**

p* = 0.05; *p* = 0.01.

satisfaction and a significantly stronger, negative relationship with propensity to quit the job, whereas the assistant position factor had a significantly stronger, positive relationship with job responsibility. The results with respect to relationships of the two LMX factors with effectiveness ratings were inconclusive. The consideration and coaching factor had a significantly stronger, positive relationship with ratings of unit effectiveness in subgroup 1 but not in subgroup 2. The assistant position factor was found to have a significantly stronger, positive relationship with ratings of one's own effectiveness in subgroup 2 but not in subgroup 1.

DISCUSSION

The present study investigated the dimensionality of the Leader Member Exchange concept. Our hypothesis of two-dimensionality of the Leader Member Exchange concept was strongly confirmed by the results of both the exploratory and the confirmatory factor analyses. Two factors were found and could be interpreted easily within the framework of the LMX theory (Dansereau et al., 1975). Conceptually, the consideration and coaching factor, and the assistant position factor represent the "input" of the LMX relationship coming from the leader and from the subordinate, respectively. The finding that the two-factor oblique model has a better relative fit than the two-factor orthogonal model is not surprising, as both factors are part of the LMX process and are, theoretically, supposed to be interrelated. The results of the present study cast serious doubts on the traditional approach in LMX research, in which the LMX concept has always been treated as unidimensional.

In a recent study by Norris and Vecchio (1992), the traditional, unidimensional LMX measure was found to be related to both Ohio State dimensions: consideration and initiating structure. The correlation with consideration was particularly strong (0.72). The two LMX factors found in this study can be related conceptually to dimensions that are used in other theories on leadership. The LMX consideration and coaching factor is clearly related to the classic, Ohio State consideration dimension (Stogdill & Coons, 1957). However, whereas the Ohio State dimension only reflects emotional support, the LMX dimension is made up of both emotional and instrumental support. The LMX assistant position factor bears some resemblance to the concept of participative leadership (Likert, 1961, 1967; Locke & Schweiger, 1979), as the leader allows the subordinate some influence over his or her actions and delegates some responsibilities to the subordinate. Empirical studies are needed to determine if the two LMX factors overlap with classic leadership dimensions.

The results with respect to the differential validity of the two LMX factors are promising. The strong, positive relationship between the LMX consideration and coaching factor and job satisfaction is consistent with research findings concerning the Ohio State consideration dimension (Yukl, 1989). The positive relationship

between the LMX assistant position factor and ratings of job responsibility is completely in line with the LMX theory, which states that in-group subordinates assume greater responsibilities with respect to their job performance. Having established this so far, we could now go on to examine the relationships between the two LMX factors and measures of job-related affect.

The most important reason why the results of this study need to be interpreted with caution is that all data come from the same persons (namely subordinates), which enhances the risk of common method variance. To exclude the possibility that, instead of validating factors, consistency in answering patterns of the respondents is measured, a duplicate study should be carried out in which the independent and dependent variables are assessed by different persons. Second, more research is needed to establish whether the above results concerning the differential validity of the two LMX factors can be generalized: this could be done by studying the relationships between the two LMX factors and measures of job-related affect: (1) in different occupational samples; and (2) using alternative measures of job-related affect. Moreover, relationships with other organizational variables (for example, occupational health variables) should be investigated.

To our knowledge, the study reported above is the only one in which the dimensionality of the LMX concept has been examined, so our results cannot be compared with those of other researchers. If the results of the present study can be replicated in studies using different occupational samples, different measures of job-related affect, and multiple data sources, this indicates that a significant modification should be made in research on the LMX theory.

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