

# Measuring Quality of Interaction Between Leaders and Members

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The paper reports the development of a scale to measure the quality of interaction between leaders and members in line with the leader member exchange/vertical dyad linkage theorization of Dansereau, Graen, and Haga (1975), incorporating the suggestions of Dienesch and Liden (1986). Construct definitions were developed and items were generated and evaluated for content validity. A varimax rotated factor analysis of the data yielded only 2 of the proposed 3 factors—perceived contribution and affect. The two subscales documented factor stability and high reliability coefficients. Within- and between-groups analysis found support for dyadic nature of interaction. The implications of the results are discussed and conclusions are drawn about the new scale.

Traditionally, leadership has been studied as a phenomenon of the leader or the subordinates. The focus has been primarily on the leaders, be it their traits (e.g., Byrd, 1940; Stogdill, 1948; Zaccaro, Foti, & Kenny, 1991) or behavior (e.g., Fleishman, 1973; Likert, 1967). Essentially, the concern has been with the behavior of the leader with their subordinates, treating all the subordinates in a work group as one entity.

The contingency theories (e.g., Fiedler, 1967; Hersey & Blanchard, 1977) identify the importance of situations and they deem certain styles, behaviors, and traits suitable for some particular situations, yet all of them average these styles, traits, et cetera, over the work group. Hence, most of them wittingly or unwittingly make an average assumption about the work group wherein the leader is assumed to have the same interaction with all of the subordinates, and the subordinates are assumed to have the same job-related attitudes and behaviors as a result of the leader's style (Dansereau, Graen, & Haga, 1975). As a consequence of this a priori assumption the measures of leadership style (e.g., Leader Behavior Description Questionnaire [LBDQ]) are aimed at getting the

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subordinates' perception of their leader's style and averaging the responses of all the subordinates under a leader to identify the leader's style, thereby making an average assumption about the leader's style.

The vertical dyad linkage (VDL) or the leader member exchange (LMX) theorization began with the that the work unit under a leader should not be assumed to be a single entity (Dansereau et al., 1975). In their discovery study, Dansereau et al. identified the possibility of a leader indulging in two different kinds of behaviors with the subordinates. For this, they took a clue from Jacobs' (1970) distinction between "leadership" and "supervision" as two techniques.

Employing the *supervision* technique, the nature of the vertical exchange is such that a superior relies almost exclusively upon the formal employment contract in his exchanges with the member . . . . In contrast, employing the technique of *leadership* the nature of the vertical exchange is such that the superior cannot rely exclusively upon the employment contract. Instead, he must seek a different basis for influencing the behavior of a member. This alternative basis of influence is anchored in the interpersonal exchange relationship between a superior and a member. (Dansereau et al., 1975, p. 49, emphases added)

The result of their pioneer as well as subsequent studies corroborated their contention of the dyadic nature of exchanges. This means that the nature of interactions between the leader and his/her individual subordinate may vary and it may not be correct to make an average assumption about the work group. If the interactions between a leader and his/her members vary then the dimensions along which these interactions vary need to be identified. It is a contention of the authors that though the style of a leader may be generalizable across the work group, there are some dimensions of the interactions that show variations within a work group and they have an impact on the functioning of the group. A brief review of the various operationalizations of this interaction follows.

Dansereau et al. (1975) conceptualized LMX with a two-item measure in terms of the negotiating latitude, which was defined as "the extent to which a superior is willing to consider requests from a member concerning role development" (p. 51). Theirs was a longitudinal study, and the latitude given to the members at the initial stage was the predictor of different outcomes at later stages. Following this initial two-item operationalization, there have been many formulations and reformulations of the LMX measure. Table 1 lists various studies and the measures of LMX used in them. Following this,

Table 1

*Quality of Exchange Measures Used in Different Studies*

Study	Measure
Dansereau, Graen, & Haga (1975)	NL (2 items)
Graen & Cashman (1975)	NL (4 items)
Cashman, Dansereau, Graen, & Haga (1976)	NL (2 items)
Graen, Cashman, Ginsburgh, & Schiemann (1977)	NL (4 items)
Graen & Ginsburgh (1977)	NL (2 items)
Graen & Schiemann (1978)	NL (4 items)
Schriesheim (1979)	LBDQ
Katerberg & Hom (1981)	LBDQ
Graen, Novak, & Sommerkamp (1982)	LMX (7 items)
Graen, Liden, & Hoel (1982)	LMX (5 items)
Kim & Organ (1982)	NSE
Vecchio (1982)	LPC
Rosse & Kraut (1983)	LNL and MNL
Vecchio & Gobdel (1984)	NL (4 items)
Seers & Graen (1984)	NL (4 items)
Scandura & Graen (1984)	LMX (7 items)
Wakabayashi & Graen (1984)	LMX (12 items)
Ferris (1985)	LMX (5 items)
Snyder & Bruning (1985)	NL (4 items)
Duchon, Green, & Taber (1986)	LMX (5 items)
Scandura, Graen, & Novak (1986)	LMX (7 items)
Wakabayashi, Graen, Graen, & Graen (1988)	LMX (12 items)
Kozlowski & Doherty (1989)	LMX (7 items) IE (8 items)

*Note.* NL = negotiating latitude. LBDQ = Leader Behavior Description Questionnaire. LMX = leader-member exchange. NSE = noncontractual social exchange. LPC = least preferred coworker. LNL and MNL = leaders negotiating latitude and members negotiating latitude. IE = information exchange.

Table 2

*Pool of Items Used in Different Measures*

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- (1) How flexible do you believe your supervisor is about evolving change in your job?
  - (2) Regardless of how much formal authority your supervisor has built into his position, what are the chances that he would be personally inclined to use his power to help you solve problems in your work?
  - (3) To what extent can you count on your supervisor to “bail you out” at his own expense when you really need him?
  - (4) How often do you take suggestions regarding your work to your supervisor?
  - (5) How would you characterize your working relationship with your supervisor?
  - (6) Do you usually feel that you know where you stand . . . do you usually know how satisfied your immediate supervisor is with what you do?
  - (7) How well do you feel that your immediate supervisor understands your problems and needs?
  - (8) How well do you feel that your immediate supervisor recognizes your potential?
  - (9) I have enough confidence in my supervisor that I would defend and justify his or her decisions if he or she were not present to do so.
- 

Table 3

*Constitution of Leader-Member Exchange [LMX] Measures*

Measures	Items used <sup>a</sup>
Negotiating latitude	1, 2
Negotiating latitude	1, 2, 3, 4
LMX	1, 2, 3, 4, 5
LMX	1, 2, 5, 6, 7, 8, 9

<sup>a</sup>Numbers are the corresponding items in Table 2.

Tables 2 and 3, respectively, contain the pool of all the items contained in these measures and the constitution of the various measures.

It can be seen in Table 1 that negotiating latitude (two- and four-item versions) and LMX (five- and seven-item versions) are the most frequently used measures. Table 2 reveals that these measures mainly incorporate supervisors' flexibility, support, and understanding in helping their subordinates at work. It should also be noted at this place that some researchers have even used 12-item (Wakabayashi & Graen, 1984) and 14-item (Wakabayashi, Graen, & Uhl-Bien, 1990) versions of the LMX (these measures are not reported in Tables 2 and 3).

As is evident in Tables 1 through 3, there is not a single measure of LMX that satisfies all researchers equally. A review of the literature indicates that these measures have not been subjected to rigorous psychometric tests, as a result of which they lack explicit construct validation (Dienesch & Liden, 1986; Vecchio & Gobdel, 1984).

Second, negotiating latitude is salient in the initial stages when the member just enters the work group and is in the process of defining his or her role. The roles that the member takes are negotiable, and through the process of role development, the member comes to define her/his role over a period of time (Graen & Scandura, 1987). Superiors have been found to show resistance in evaluating the performance of the subordinates when the subordinate has not spent enough time with the leader (Fried, Tiegs, & Bellamy, 1992). Consequently, what goes on in the initial stages of role development will be different from what becomes salient after the role gets defined. Thus, if the study is longitudinal (e.g., Dansereau et al., 1975) and starts at the initial stages of role development, then these measures seem suitable. But if the researcher is interested in a cross-sectional study after the member has settled down properly in the group and his or her role has crystallized, the existing measures are not directly relevant but other measures may become more salient.

Graen and Scandura (1987) noted that there are active exchanges of favor, contribution, et cetera, only in the initial stages of role development by the subordinate when the leader is trying to put across his or her expectations and rewards to the subordinate, and the subordinate is putting across his or her expectations and abilities to the leader. However, once the role gets defined, there develops a dyadic understanding between the two and the exchanges become subtle, acquiring a taken-for-granted nature. Hence after the relationship is crystallized, the interaction between the two gets marked with other salient features. At this stage, therefore, it is not the exchanges which are to be measured, but it is the quality of interaction which should to be attended to. This interaction is better articulated through the actual contribution on the job, loyalty, affection, et cetera.

Finally, at a stage where the relationship between the leader and the member is crystallized, LMX is not a unidimensional construct, but may consist of many dimensions (Dienesch & Liden, 1986). At least two dimensions that are salient to these stages have been proposed by Graen and Scandura (1987). One dimension refers to on-the-job behaviors—that is, contribution of both the leader and the member. Another dimension relates to relational or affective interaction between the two. Thus, the interaction between the leader and the member is multidimensional in nature, and its measurement should tap this multidimensional nature of the construct.

First, the study aims at developing a new psychometrically sound, multidimensional measure to tap the interaction between the leader and the member at a stage the interaction between the two has crystallized and has the capacity to be evaluated from both perspectives (i.e., leader and member). Hence, the newly developed scale has been named the quality of interaction measure. Second, the study aims to test whether the different subordinates under one leader have significantly different interactions with their leader.

#### Item Development Process

On the basis of the literature review and the prior theoretical recommendations (Dienesch & Liden, 1986; Graen & Scandura, 1987), the development of a new measure of quality of interaction was initiated. At the very outset, the aim was to use new and conceptually consistent theoretical definitions of the various dimensions of quality of interaction.

#### *Theoretical Construct Definitions*

In the original formulation of the VDL/LMX model of leadership, LMXs were conceptualized primarily on the basis of work behavior of leaders and subordinates. Dienesch and Liden (1986) argued that work behaviors are certainly important, but exchanges may also develop and establish in a number of different ways. They thus identified three dimensions which, according to them, act as “currencies of exchange.” The first dimension is the “perceived leader-member contribution to the exchange that is perception of the amount, direction, and quality of work oriented activity each member puts forth towards the mutual goals (explicit or implicit) of the dyad” (Dienesch & Liden, 1986, p. 624).

This definition of contribution was taken as it is for the development of the scale in the present study. This dimension of on-the-job (work-related) interaction of the leader-member dyad has been found to be important not only in

developing relationships, but also in the established dyadic exchanges (Scandura, Graen, & Novak, 1986). Leader-member loyalty is the second exchange dimension which was defined by Dienesch and Liden (1986) as "the expression of public support for the goals and the personal character of the other member of the dyad" (p. 625). In the present context, "loyalty" was defined as the perception of support, linking and help the other member of the dyad gets from the workgroup on the job. The third dimension was affect, defined as "the mutual affection the members of the dyad have for each other based primarily on the interpersonal attraction rather than work or professional values" (p. 625). In the present scale, affect was operationalized in terms of the amount of interaction both on and off the job, the extent and quality of personal interaction and liking for each other. This dimension takes care of the relational and affective responses of the dyad members for each, and it has been found to be critical in the established leader-member dyads (George, 1990; Wayne & Ferris, 1990).

Thus, the starting point for the selection of the various dimensions to develop the scale and generate items is the three dimensions sketched by Dienesch and Liden (1986).

#### *Item Generation and Content Validity Examination*

On the basis of the dimensions of the quality of interaction defined above, deductively, a pool of 45 items was generated, each dimension with 15 items. The items were worded in the form of interrogative statements in such a way as to be evaluated from both perspective, leader and member.

The items were reviewed and judged at this stage for content validity. Content validation was performed in two phases. First, the two authors along with the two other experts served as judges to evaluate each of the 45 items to be identified in the three dimensions. This exercise was also geared toward recommending modifications (change, drop, and add) and identifying unclear items. It resulted in 15 confusing, unclear, and inappropriate items, thus reducing the size of the scale to 30 items for further assessment. Next, five judges from five diverse disciplines (psychology, sociology, economics, philosophy, and linguistics) were given the construct definitions. The task of the judges was to sort the various statements, on the basis of item descriptions, as belonging to one of the three dimensions of quality of interaction. The statements on which there was an agreement of 80% were accepted as items of that category. In this way, the total number of items was reduced to 24; of these 24, 9 items belonged to "perceived contribution," 7 to "loyalty," and 8 to "affect" dimensions of the scale. (The Appendix contains list of these 24 items as presented to the respondents.)

## Method

For the purpose of scale development and testing, two independent samples were taken. The quality of interaction items were administered to two different samples at two different times. Sample B was used primarily for cross-validation purposes and for testing the average versus dyadic hypothesis. A brief description of the samples is given below.

### *Samples*

*Sample A.* This sample consisted of managers from four different organizations located in northern India, of which two were public-sector (government-owned) and two were privately managed. The organizations were chosen randomly with no explicit criteria. Although all of the four organizations chosen were production units, they ranged in the nature of their product from urea to electrical units. Of the four organizations, two were running in profit and two were running in loss. The data were collected from a total of 219 executives representing all of the managerial levels (ranging from supervisors to general managers) and all of the divisions of the organization (production, accounts, sales, personnel, etc.).

As mentioned earlier, the objective of the study was to develop a scale which had the potential to be evaluated from both perspectives (the leader and the member). In view of this, therefore, a split of the sample in terms of these perspectives is important, too. Of the 219 respondents, 67 were leaders and 152 were members. In Organization 1, there were 11 leaders and 40 members (total of 51); in Organizations 2 and 3, there were 15 leaders and 30 members each (a total of 45 respondents in each of the two organizations); and in organization 4, there were 26 leaders and 52 members (total of 78). Table 4 depicts the mean scores on background characteristics of the participants.

As can be seen in Table 4, the leaders were significantly higher than the members in terms of age, educational qualifications, tenure in organization, number of promotions received, and earned monthly income. However, leaders and members did not show any difference in terms of tenure in the present position.

*Sample B.* This sample was employed for cross-validation purpose and to test the average versus dyadic hypothesis. It consisted of managers from one organization situated in northeastern India. It was a public-sector organization involved in the production of urea from naphtha.

The responses in this study were only from the subordinate perspective, and the total number of respondents was 96. These 96 members belonged to 26 work groups with mostly 4 but sometimes 3 members in a work group. The



Table 4

*Means and F Ratios of Background Variables for Leaders and Members (Sample A)*

Variable	<i>M</i>		<i>F</i> (1, 217)	Overall <i>M</i> ( <i>N</i> = 219)
	Leaders ( <i>n</i> = 67)	Members ( <i>n</i> = 152)		
Age	48.09	41.00	49.91*	43.17
Number of years in the organization	16.81	13.63	8.31*	14.60
Number of years in present position	3.63	3.20	1.89	3.33
Number of promotions	4.21	2.95	25.88*	3.33

\**p* < .01.

majority (about 98%) had at least a Bachelor's degree. Their mean age was 47.06 years, their average tenure in the organization was 17.79 years, and their average tenure in the present position was 4.46 years.

### *Procedure*

The data were collected with the help of a structured questionnaire. To choose a sample from within an organization, all such managers were identified who had approximately four people directly reporting to them. These managers were taken as the leaders, and the subordinates reporting to them were taken as members. This sampling frame provided leaders an opportunity to evaluate their immediate subordinates and subordinates to evaluate their immediate leaders. All such subordinates were taken who had worked with their leader at least for 1 year.

In Sample A, the leader responded to the quality of interaction (QI) measure for all of the subordinates under him (number of subordinates under one leader ranged from 2 to 4). If there were four subordinates under a leader, the leader responded to the QI scale four times, one for each subordinate. Thus, although the total number of respondents in Sample A was 219, the total number of responses was 304 (152 from the leaders' perspective and 152 from

the members' perspective) for the QI measure. Since the five-item LMX scale had the potential to be evaluated only from the members' perspective, the total number of responses on this measure was 152 (i.e., the number of subordinates).

In Sample B, however, only the subordinates' responses for QI were taken, and, as mentioned earlier, the total number of respondents for this sample was 96. These 96 subordinates belonged to 26 work groups, mostly with 4 subordinates in one group. The managers in both samples were personally contacted (by the first author, with detailed instructions, written and verbal, on completion of the questionnaire). Participation in the research was voluntary, with complete anonymity of individual responses guaranteed.

In addition to the QI items specifically developed for the present study, several other measures were employed in the questionnaire for validation purposes. A brief description of these measures is presented below.

### *Measures*

*Quality of interaction.* The questionnaire contained items of QI and LMX (five-item version as used by Graen, Liden, & Hoel, 1982) in Sample A. In Sample B, along with QI items, items of attention and latitude (given by the leaders to the subordinates; Dansereau, Alutto, & Yammarino, 1984) were included. For the QI, respondents were asked to respond on a 7-point scale, ranging from 1 (*not at all*) to 7 (*very much*), the degree to which each item was true for the interaction between him/her and the other person (the leader's or the member's name with whom the interaction was to be evaluated was mentioned). The LMX scale, used in Sample A, showed a fairly high reliability coefficient of .81. The mean and standard deviation of the scale were 14.81 and 3.30, respectively. These two measures tapped the interaction between the leader and the individual subordinate in Sample A. Attention and Latitude scales used in Sample B, along with QI, showed, respectively, reliability coefficients of .91 and .90, means of 15.02 and 12.65, standard deviations of 5.56 and 3.95, and an intercorrelation of .82. The QI scale in Sample B comprised 10 items (5 items each for perceived contribution and affect), which survived in Sample A after factor analysis.

*Satisfaction.* This scale was used for Samples A and B. In Sample A, a 16-item scale (Schnake, 1983) included satisfaction with different aspects of the job. The respondents were asked to evaluate how satisfied they were with each of these aspects on a 7-point scale, ranging from 1 (*very dissatisfied*) to 7 (*very satisfied*). A varimax rotated factor analysis yielded two neat factors with seven significant items. The results of the analysis are reported in Table 5. The two factors together explained a total of 90.7% of variance.

Table 5

*Factor Loadings Obtained—Satisfaction Measures*

Item	Factor 1	Factor 2
2. The friendliness of the people you work with	.69	.18
5. The respect you receive from the people you work with	.67	.13
10. The amount of job security you have	.50	.24
11. The amount of personal growth and development you get in doing your job	.22	.77
12. The feeling of worthwhile accomplishment you get from doing your job	.31	.78
14. The amount of challenge in your job	.27	.72
16. The chances for advancement on your job	.06	.60
Eigenvalue	6.36	1.32
Percentage of variance	75.10	15.60
<i>M</i>	16.38	18.45
<i>SD</i>	2.88	5.15

*Note.*  $N = 219$ . Factor 1 = extrinsic satisfaction. Factor 2 = intrinsic satisfaction. Italicized numbers indicate the loadings on the basis of which the item is included in that factor.

The first factor had elements of friendliness, respect received, and job security and was labeled extrinsic satisfaction. Items in the second factor reflected growth opportunity and advancement on the job and hence was called intrinsic satisfaction. The two satisfaction subscales showed adequate reliability coefficients of .67 and .85, respectively, and were only moderately correlated ( $r = .45$ ). The means and standard deviations shown in Table 5.

Although the total number of responses on satisfaction was 219 (from all respondents), for the test of criterion-related validity, only responses from the member perspective were incorporated. Hence, the sample size for factor analysis is 219 and the sample size used for correlation analysis as a test of concurrent validity is 152 (responses from subordinates only).

In Sample B, the two subscales, extrinsic (three items) and intrinsic (four items) satisfaction, showed reliability coefficients of .88 and .84, means of 14.37 and 15.96, and standard deviations of 4.07 and 5.13, respectively. This

measure of satisfaction was used to test criterion-related validity because satisfaction is a traditional dependent variable in leadership research (Dansereau et al., 1975; Scandura & Graen, 1984; Vecchio & Gobdel, 1984).

*Organizational commitment.* This scale was also used with Samples A and B. Nine items were drawn from the original 15-item commitment scale (Porter, Steers, Mowday, & Boulian, 1974); the 6 items that represented intent to leave were left out, as this outcome dimension has received separate treatment in the present research. The respondents were asked to indicate their agreement/disagreement with each item on a 7-point scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A varimax rotated factor analysis of commitment items confirmed one single factor involving all nine items. The reliability coefficients (Cronbach's alpha) of this scale for Sample A and Sample B, respectively, were .87 and .88, with means of 43.95 and 38.41, and standard deviations of 10.38 and 10.52.

*Intention to quit.* Intention to quit was measured with a two-item scale (Mayes & Ganster, 1982). For both items, rated on a 5-point scale, respondents were asked to indicate their intention to quit/stay in the organization in the near future. The two items were highly correlated ( $r = .98$ ), with a mean of 2.26 and a standard deviation of .83. This scale was used only with Sample A.

*Unit effectiveness.* This scale was used only with Sample B. It consisted of eight items (Mott, 1972). Respondents were asked to report their perceptions of their work group on a 5-point scale estimating its effectiveness. A varimax rotated factor analysis yielded one factor, with all of the items having high loadings. The scale showed an impressive reliability coefficient of .90, with a mean of 22.94 and a standard deviation of 8.39.

## Results

### *Development of the Quality of Interaction Measure*

*Test of variability.* As a first step, we calculated the variance on each of the 24 items of QI. The analysis revealed that all 24 items exceeded unity (i.e.,  $S^2 > 1.00$ ). Thus, no items were removed for lack of variability at this stage.

*Factor analysis.* The responses to the 24-item scale were subjected to a varimax rotated factor analysis, as a partial test of construct validity. As a first step to identify the factor structure, all of the data ( $N = 304$ ) were subjected to this analysis. Only those factors that had eigenvalues around 1 were included. Items in a factor were retained only when the factor loadings were above .50 generally below .30. When the loadings of an item on one factor were very high, the criterion of cross loadings obtained was relaxed a bit. Subsequently, in order to test convergent validity, the data from both the leader

Table 6

*Factor Loadings of the Quality of Interaction Measure (Leader, Member, and Combined Perspectives)*

Item	Factor loadings					
	Combined		Member		Leader	
	F1	F2	F1	F2	F1	F2
4. How much responsibility does he/she take for the jobs that are to be done together by you and him/her?	.81	.29	.83	.24	.74	.29
15. How much is his/her contribution to the quantity of solutions on the jobs that are to be done together by you and him/her?	.82	.20	.82	.22	.73	.14
17. How efficient is his/her contribution on the jobs for which the two of you work together?	.82	.30	.82	.27	.70	.30
21. How useful is his/her effort on the jobs that are to be done together by you and him/her?	.84	.29	.83	.30	.78	.24
24. How much initiative does he/she take in solving the problems that are to be done together by you and him/her?	.80	.32	.76	.34	.71	.26
7. How much do you interact with each other off the job?	.32	.61	.34	.56	.16	.68
13. How much do you help each other in personal matters?	.14	.88	.10	.87	.20	.88

*(table continues)*

Table 6 (continued)

Item	Factor loadings					
	Combined		Member		Leader	
	F1	F2	F1	F2	F1	F2
16. How much advice do you seek from each other on personal problems?	.21	<i>.88</i>	.18	<i>.90</i>	.23	<i>.85</i>
19. How much do you discuss your personal matters with each other?	.18	<i>.90</i>	.15	<i>.90</i>	.15	<i>.90</i>
23. How much importance do you attach to each other's advice on personal matters?	.31	<i>.76</i>	.32	<i>.74</i>	.24	<i>.76</i>
Eigenvalue	14.00	3.28	13.73	2.44	14.38	0.84
Percentage of variance	85.50	14.50	84.90	15.50	81.50	4.80

Note. F1 = perceived contribution. F2 = affect. Italicized numbers indicate the loadings on the basis of which the item is included in that factor.

and the member perspectives independently were subjected to the same method of factor analysis. The factor loadings and cross-loadings obtained for the two factors (each with five items) and for the three sets of data independently (combined, leader perspective, and member perspective) are given in Table 6.

Although the factor analysis results from leader perspective revealed three factors, none of the items in Factor 2 met the requirement of cross-loading below or around .30. All of the items that loaded heavily on the second factor showed high cross-loadings on Factor 1 (usually the magnitude being in the .40s or above). Therefore, only Factors 1 and 3 were included, which corresponded to the items on Factors 1 and 2 from the members' perspective. In Sample B, the scale developed in Sample A was used as a measure of QI. A varimax rotated factor analysis of the data for the cross-validation of Sample B confirmed the same two dimensions, thereby showing the stability of factor structures.

Table 7

*Descriptive Statistics, Inter-Item Correlations, and Item-Test Correlations of the Quality of Interaction Scale*

Item <sup>a</sup>	4	15	17	21	24	7	13	16	19	23
4	—									
15	.72	—								
17	.75	.82	—							
21	.77	.78	.81	—						
24	.75	.75	.78	.80	—					
7	.40	.38	.46	.43	.43	—				
13	.37	.29	.38	.38	.40	.58	—			
16	.40	.37	.45	.42	.46	.58	.82	—		
19	.40	.32	.42	.40	.45	.61	.83	.88	—	
23	.47	.35	.45	.48	.50	.59	.70	.69	.72	—
<i>M</i>	5.13	4.92	4.94	5.01	4.90	3.44	3.40	3.07	3.03	3.81
<i>SD</i>	1.46	1.36	1.34	1.36	1.45	1.75	1.61	1.47	4.07	1.64
Item-test <i>r</i>	.81	.84	.87	.87	.85	.65	.84	.85	.87	.76

Note.  $N = 304$ . Italicized figures indicate inter-item correlations within the subscale.

<sup>a</sup>For the description of the items, refer to Table 4.

*Scale Characteristics*

Table 7 lists the descriptive statistics of the items, inter-item correlations, and item total correlations of the scale for Sample A. It can be seen from Table 7 that the items within a factor showed fairly high correlations, as opposed to the items across the factors. The two subscales were only moderately correlated ( $r = .50$  for the combined data), thereby showing subscale independence, and at the same time forming two dimensions of the same construct. For Sample B, the correlation between perceived contribution and affect was .62.

*Reliability and Validity*

The reliabilities (Cronbach's alpha), means, and descriptive statistics of the subscales are given in Table 8. As can be seen, the scale shows high reliability coefficients (i.e., in .90s) for both samples.

Table 8

*Means, Standard Deviations, and Alpha Coefficients of the Quality of Interaction Scale*

Sample	Subscale	<i>M</i>	<i>SD</i>	$\alpha$
Sample A				
Combined ( <i>N</i> = 304)	F1	24.92	6.31	.94
	F2	16.75	6.90	.92
Leader ( <i>N</i> = 152)	F1	24.57	6.28	.95
	F2	16.10	6.49	.93
Member ( <i>N</i> = 152)	F1	25.26	6.35	.93
	F2	17.41	7.25	.91
Sample B				
Member ( <i>N</i> = 96)	F1	22.08	7.34	.93
	F2	17.16	7.62	.92

*Note.* F1 = perceived contribution. F2 = affect. Each subscale consists of five items.

As mentioned earlier, a five-item version of the LMX scale (Graen, Liden, et al., 1982) was also included in Sample A to measure the external validity of the scale. This measure evaluated responses only from the member perspective, and hence the total number of respondents on this measure was 152. In Sample B, two additional measures of quality of exchange—attention and latitude (Dansereau et al., 1984)—were included to test the concurrent validity of the scale. The zero-order correlations between the traditional measures of quality of exchange and the two dimensions of QI measure (perceived contribution and affect) are reported in Table 9. It is evident that all three traditional measures of quality of exchange (LMX, attention and latitude) had a fairly high correlation with both the dimensions of QI scale.

To test the criterion related validity of the newly developed scale, the two dimensions of the QI scale were correlated with several criterion measures: intrinsic and extrinsic satisfaction, intention to quit, organizational commitment, and unit effectiveness. These validity coefficients are presented in Table 10.

It can be readily observed in Table 10 that the two dimensions of the newly developed scale were all logically and strongly correlated with outcome measures (perceived contribution and affect) in both samples. The



Table 9

*Intercalations Among Quality of Exchange Measures*

	PC	AF	LMX	AT	LT
PC	-	.50	.77	+	+
AF		-	.52	+	+
LMX	+	+	-	+	+
AT	.81	.72	+	-	+
LT	.68	.69	+	.82	-

Note. Entries above the diagonal are for Sample A (N = 152). Entries below the diagonal are for Sample B (N = 96). PC = perceived contribution. AF = affect. LMX = leader-member exchanges. AT = attention. LT = latitude. += not tested.

Table 10

*Correlations Between Quality of Exchange Measures and Outcome Variables*

Outcome <sup>a</sup>	PC	AF	Sample B <sup>b</sup>		
			PC	AF	
IS	.34	.35	IS	.50	.52
ES	.34	.28	ES	.57	.49
CO	.35	.27	CO	.59	.57
IL	-.18	-.17	UE	.60	.62

Note. PC = perceived contribution. AF = affect. IS = intrinsic satisfaction. ES = extrinsic satisfaction. CO = commitment. IL = intent to leave. UE = unit effectiveness. <sup>a</sup>N = 152. <sup>b</sup>N = 96.

findings are consistent with LMX/VDL theory (Dansereau et al., 1975) and provide evidence for strong criterion-related validity of the newly developed QI scale.

*Test of Average Versus Dyadic Hypothesis*

To test this hypothesis, within- and between-groups (WABA) was conducted (Dansereau et al., 1984) on Sample B data only because in this sample there were enough subordinates in a work group (usually 4) to test the

Table 11

*Test of Average Versus Dyadic Hypothesis for Quality of Interaction*

	PC	AF
<i>eta</i> between (26)	0.43	0.53
<i>eta</i> within (69)	0.90*	0.85*
<i>E</i> -ratio	0.48	0.62
<i>R</i> -ratio	0.61	1.02

Note.  $N = 96$ . Numbers in parentheses are degrees of freedom. PC = perceived contribution. AF = affect.

\* $p < .01$ .

variability of scores within the groups, whereas in Sample A there were only two subordinates in a work group, thereby limiting the variation.

The underlying principle of this analysis is to split the total variation on a variable into within and between variations (the definition of within and between depends on the focus of the research). In the present work, the focus is the work group under a leader. The details of this analysis are given in Dansereau et al. (1984) under WABA I. For the present research, the requirement is to see whether or not there is enough variation within a group. Thus, what is important for us is within-group variance. This within and between variance which is denoted as *eta* coefficients, is the Pearson correlation of within and between variations with total variation on the variable. Thus, for our purposes if *eta*(within) is significant, our hypothesis of a dyadic nature of interactions holds true. WABA uses the ratio of *eta*(within) to *eta*(between) to test which variation is more significant. These ratios are *E* and *F* ratios. WABA is unique in the sense that besides testing the level at which leadership interactions occur, it provides a methodology for testing the practical significance of scores along with the statistical significance for which it uses trigonometric functions. This practical significance is denoted by *E*. This significance test is independent of the sample size.

The results of this analysis for perceived contribution and affect as two dimensions of leader-member interaction are reported in Table 11.

It can be seen that both perceived contribution and affect show evidence toward a differentiated work unit in terms of highly significant *eta*(within) coefficients. These coefficients are highly significant for both subscales. This means, then, that there is a significant variation in perceived contribution and affect, between a leader and the different members within the work group.

## Discussion and Conclusions

The main objective of the present study was to develop a psychometrically sound, multidimensional measure QI between the leaders and the members, in response to the issues raised by Dienesch and Liden (1986). The scale development process began with the three dimensions identified by Dienesch and Liden. The analysis results revealed that only two (i.e., perceived contribution and affect) of the proposed three dimensions may be relevant to evaluate QI between the leaders and the members as the factor analysis for both the samples (A and B) yielded two identical factors. Further, in Sample A, factor analysis from both the leader and the member perspectives yielded the same two factors. In Sample A, the first factor for all three sets of data (combined, leader, and member perspectives) contained five items. All of these items corresponded to the contribution on the job and, hence, the factor was PC. The contribution of the other party was evaluated in terms of responsibility taken, efficiency, usefulness (relevance), amount of effort, and initiative on the jobs that the two parties in the dyad had to do together (Table 4). For both the leader and the member perspectives, this was the first and the most powerful factor. This reveals the centrality of contribution on the job both from the leader and the member perspectives.

The second factor included five items of mutual liking, and was called affect. The items incorporated different aspects of personal interaction, such as discussing and seeking advice on personal problems, amount of interaction off the job, accepting help in personal matters, and so on (Table 6). Table 7 also shows that Item 7 (specifying interaction off the job) had a relatively weak (though acceptable) item-test correlation. As can be seen in Table 6, Item 7 corresponded to interaction off the job, and this interaction may be a function of other variables besides affect, such as home locations, religious affiliations, and so on (Crouch & Yetton, 1988). For both the leader and the member, affect was the second factor that explained much lesser variance than perceived contribution.

The emergence of two factors in the same order from both the leaders and the members in Sample A confirmed that the dimensions chosen have the potential to be evaluated from both perspectives. Further, the emergence of the same two factors in cross-validation of Sample B provided additional evidence of the stability of factor structures of the subscales.

Loyalty, which was operationalized in terms of third party perceptions, did not emerge as an independent factor. This is probably because both the parties involved (i.e., the leader and the member) evaluated the relationship primarily at the dyadic level, so the perceptions of the third-party were not considered very relevant. Even when these third party perceptions were considered relevant they overlapped with the domain of contribution on the job (from the

leader's perspective). In the Indian value system too, loyalty from the members is an important dimension, but it does not involve the third-party perceptions; instead, loyalty in a leader-member dyad consists of deference (Shradha) from the subordinates and nurturance from the leader. Hence, the two broad areas (dimensions) that are considered relevant and significant for the evaluations of dyadic interactions are contribution on the job, and affective reactions of the leader and the member toward each other.

Thus, we have a two-dimensional scale which has the potential to be evaluated from both perspectives. Additionally, the scale showed a strong reliability (Table 6) and evidence of external validity. Perceived contribution displayed a higher correlation with LMX, as compared to affect; this corroborates the point that both LMX and perceived contribution measure on-the-job behavior of the member, the leader, or both.

The strong zero-order correlations of perceived contribution and affect with extrinsic and intrinsic satisfaction, commitment, intention to leave, and unit effectiveness provided evidence for criterion-related validity to the scale, since almost all of the leadership research has focused on predicting these outcomes for the subordinates and has consistently shown that leadership and satisfaction, commitment, et cetera, of the subordinates have a strong correlation. However, it needs to be mentioned here that perceived contribution and affect did not show differential impact on the outcome variables. This could probably be because of the fact that the outcomes taken here are very generic and get predicted by the quality of interaction as such. These dimensions, all the same, are expected to have differential impact on other variables such as perceived equity, cohesiveness and conflict, use of upward influence tactics, et cetera. Subsequent studies may focus on these issues.

However, a word of caution about the study is in order at this point. First of all, the size of Sample B is not very large, and hence the results can be taken only as indicative of a trend. More studies need to be conducted to establish the indications in Sample B. This holds true particularly for the average versus dyadic hypothesis, as this hypothesis was tested only in Sample B. Further, the results of between variation,  $\eta^2(\text{between})$  need not be taken at face value, as common factors such as the climate of the organization weaken the between-groups variation if the sample is taken from one organization. The research did not attempt to handle this attenuation effect because the focus was largely on  $\eta^2(\text{within})$ . The results of  $\eta^2(\text{between})$ , however, have to be taken cautiously.

Next, the results of criterion validity as measured through zero-order correlations could be a little inflated, as data for both the predictor and the criteria were taken from the same subjects and could have the same source or method bias. Lastly, although the scale is expected to be culturally free because the dimensions taken in this research are the ones given by Dienesch and Liden

(1986) and are universal in nature, the sample consists of respondents from one culture. Hence, further research across cultures is required to establish cross cultural validity of the scale.

The present research makes two contributions in the shape of one scale to measure QI that demonstrates adequate psychometric properties and is an answer to Dienesch and Liden's (1986) reservations about the prior scales. The results of the study are strong and positive but they do need to be tested across samples to give them cross-sample validity. Despite the need for additional research to validate the new scale, future researchers may be advised to use the new scale as opposed to the ad hoc measures. It may be useful to use the scale in studying the power imbalance within a work group and the career progress of the subordinates (Wakabayashi, Graen, Graen, & Graen, 1988), and for predicting other leadership related outcomes such as intention to leave, productivity, employee turnover, and the like.

#### References

- Byrd, C. (1940). *Social psychology*. New York, NY: Appleton-Century-Crofts.
- Cashman, J., Dansereau, F., Graen, G., & Haga, W. (1976). Organizational understructure and leadership: A longitudinal investigation of the managerial role making process. *Organizational Behavior and Human Performance*, *15*, 278-296.
- Crouch, A., & Yetton, P. (1988). Manager-subordinate dyads: Relationships among task and social contact, manager friendliness and subordinate performance in management groups. *Organizational Behavior and Human Decision Processes*, *41*, 65-82.
- Dansereau, F., Alutto, J. A., & Yammarino, F. J. (1984). *Theory testing in organizational behavior: The variant approach*. Englewood Cliffs, NJ: Prentice-Hall.
- Dansereau, F., Graen, G., & Haga, W. J. (1975). A vertical dyad linkage approach to leadership within formal organizations. *Organizational Behavior and Human Performance*, *13*, 46-78.
- Dienesch, R. M., & Liden, R. C. (1986). Leader-member exchange model of leadership: A critique and further development. *Academy of Management Review*, *11*, 618-634.
- Duchon, D., Green, S. G., & Taber, T. D. (1986). Vertical dyad linkage: A longitudinal assessment of antecedents, measures, and consequences. *Journal of Applied Psychology*, *71*, 56-60.
- Ferris, G. R. (1985). Role of leadership in withdrawal process: A constructive replication. *Journal of Applied Psychology*, *70*, 777-781.

- Fiedler, F. E. (1967). *A theory of leadership effectiveness*. New York, NY: McGraw-Hill.
- Fleishman, E. A. (1973). Twenty years of consideration structure. In E. A. Fleishman & J. G. Hunt (Eds.), *Current developments in the study of leadership*. Carbondale, IL: Southern Illinois University Press.
- Fried, Y., Tiegs, R. B., & Bellamy, A. R. (1992). Personal and interpersonal predictors of supervisors, avoidance of evaluating subordinates. *Journal of Applied Psychology*, *77*, 462-468.
- George, J. M. (1990). Personality, affect and behavior in groups. *Journal of Applied Psychology*, *75*, 107-116.
- Graen, G., & Cashman, J. (1975). A role-making model of leadership in formal organizations: A developmental approach. In J. G. Hunt & L. L. Larson (Eds.), *Leadership frontiers* (pp. 143-165). Kent, OH: Kent State University Press.
- Graen, G., Cashman, J., Ginsburgh, S., & Schiemann, W. (1977). Effects of linking pin quality on the quality of working life of lower participants. *Administrative Science Quarterly*, *22*, 491-504.
- Graen, G., & Ginsburgh, S. (1977). Job resignation as a function of role orientation and leader acceptance: A longitudinal investigation of organizational assimilation. *Organizational Behavior and Human Performance*, *19*, 1-17.
- Graen, G., Liden, R., & Hoel, W. (1982). Role of leadership in the employee withdrawal process. *Journal of Applied Psychology*, *67*, 868-872.
- Graen, G., Novak, M., & Sommerkamp, P. (1982). The effects of leader-member exchange and job design on productivity and satisfaction: Testing a dual attachment model. *Organizational Behavior and Human Performance*, *30*, 109-131.
- Graen, G., & Scandura, T. A. (1987). Towards a psychology of dyadic organizing. *Research in Organizational Behavior*, *9*, 175-208.
- Graen, G., & Schiemann, W. (1978). Leader-member agreement: A vertical dyad linkage approach. *Journal of Applied Psychology*, *63*, 206-212.
- Hersey, P., & Blanchard, K. H. (1977). *Management of organizational behavior* (3rd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Jacobs, T. O. (1970). *Leadership and exchange in formal organizations*. Alexandria, VA: Human Resources Research Organization.
- Katerberg, R., & Hom, P. W. (1981). Effects of within-group and between-groups variations in leadership. *Journal of Applied Psychology*, *66*, 218-223.
- Kim, K. I., & Organ, D. W. (1982). Determinants of leader-subordinate exchange relationships. *Group and Organization Studies*, *7*, 77-89.
- Kozlowski, S. W. J., & Doherty, M. L. (1989). Integration of climate and leadership: Examination of a neglected issue. *Journal of Applied Psychology*, *74*, 662-674.

- Likert, R. (1967). *The human organization: It's management and value*. New York, NY: McGraw-Hill.
- Mayes, B. T., & Ganster, D. C. (1982). *Politics and turnover: A test of hypotheses based on fight/flight responses to job stress*. Unpublished manuscript, University of Nebraska, Lincoln.
- Mott, P. E. (1972). *Characteristics of effective organizations*. New York, NY: Harper & Row.
- Porter, L. W., Steers, R. M., Mowday, R. T., & Boulian, P. V. (1974). Organizational commitment, job satisfaction and turnover among psychiatric technicians. *Journal of Applied Psychology*, **59**, 603-609.
- Rosse, J. G., & Kraut, A. I. (1983). Moderating effects of an initial leader-member exchange status on the effects of a leadership intervention. *Journal of Applied Psychology*, **69**, 428-436.
- Scandura, T. A., & Graen, G. (1984). When managers decide not to decide autocratically: An investigation of leader-member exchange and decision influence. *Journal of Applied Psychology*, **71**, 1-6.
- Schnake, M. E. (1983). An empirical assessment of the effects of affective responses in the measurement of organizational climate. *Personnel Psychology*, **36**, 791-807.
- Schriesheim, C. (1979). The similarity of individual directed and group directed leader behavior descriptions. *Academy of Management Journal*, **22**, 345-355.
- Seers, A., & Graen, G. (1984). The dual attachment concept: A longitudinal investigation of the combination of task characteristics and leader-member exchange. *Organizational Behavior and Human Performance*, **33**, 283-306.
- Snyder, R. A., & Bruning, N. S. (1985). Quality of vertical dyad linkages: Congruence of supervisor and subordinate competence and role stress as explanatory variables. *Group and Organization Studies*, **10**, 81-94.
- Stogdill, R. M. (1948). Personal factors associated with leadership: A survey of the literature. *The Journal of Psychology*, **25**, 35-71.
- Vecchio, R. P. (1982). A further test of leadership effect due to between-group variation and within-group variation. *Journal of Applied Psychology*, **67**, 200-208.
- Vecchio, R. P., & Gobdel, P. (1984). The vertical dyad linkage model of leadership: Problems and prospects. *Organizational Behavior and Human Performance*, **34**, 5-20.
- Wakabayashi, M., & Graen, G. (1984). The Japanese career progress study: A seven year follow up. *Journal of Applied Psychology*, **69**, 603-614.
- Wakabayashi, M., Graen, G., Graen, M., & Graen, M. (1988). Japanese management progress: Mobility into middle management. *Journal of Applied Psychology*, **69**, 603-614.

- Wakabayashi, M., Graen, G., & Uhl-Bien, N. M. (1990). The generalizability of the hidden investment process in leading Japanese corporations. *Human Relations, 43*, 1099-1116.
- Wayne, S. J., & Ferris, G. R. (1990). Influence tactics, affect and exchange quality in laboratory experiment and a field study. *Journal of Applied Psychology, 75*, 487-499.
- Zaccaro, S. J., Foti, R. J., & Kenny, D. A. (1991). Self-monitoring and trait-based variance in leadership: An investigation of leader flexibility across multiple group situations. *Journal of Applied Psychology, 76*, 308-315.



Appendix

*Interaction With People at Work*

The fundamental aim of this work is to study the underlying dimensions of the interaction of people at work. Your frank and sincere replies will help us understand your organization and individual dynamics and suggest some ways which might make your organization a better place to work in.

As with any professional social science research of this type, only general findings will be reported. Individual *anonymity* is completely guaranteed. No one other than the researcher will ever see any of your individual responses. **DO NOT WRITE YOUR NAME OR SIGN ANYWHERE ON THIS BOOKLET.**

You will find that it does not take very long to complete the questionnaire. Thank you very much for your responses.

Researcher's signature

A. In organizations, individuals work with different people. Working with others is a must to achieve the organizational goal(s). We want you to evaluate your interaction with \_\_\_\_\_ in terms of the following questions. Please read each of the questions carefully and judge the *degree* to which it is true of the interaction between the *two* of you. Select the number of your choice (given below) and put it to the left of the statement in the space provided.

Very much	.....	7
A good deal	.....	6
Quite a bit	.....	5
Somewhat	.....	4
A little	.....	3
Very little	.....	2
Not at all	.....	1

- (01L) How much is his/her activity valuable to other members of your group?
- (02P) How much time does he/she spend on the jobs that are to be done together by you and him/her?
- (03A) How much affection do you have for each other?

- (04P) How much responsibility does he/she take for the jobs that are to be done jointly by you and him/her?
- (05L) How much help does he/she readily get from other group members in accomplishing the group tasks?
- (06P) How much is his/her contribution in terms of the viable solutions to the problems that are to be solved together by you and him/her?
- (07A) How much do you interact with each other off the job?
- (08L) How much is his/her work activity resisted by others?
- (09P) How much is his/her contribution to the quality of solutions on the jobs that are to be done together by you and him/her?
- (10A) How much liking do you have for each other?
- (11P) How much effort does he/she put in the jobs that are to be done together by you and him/her?
- (12L) How efficient is he/she considered on his/her job by other members of your group?
- (13A) How much do you help each other in personal matters?
- (14L) How much is he/she liked by the other members of your group?
- (15P) How much is his/her contribution to the quantity of solutions on the jobs that are to be done together by you and him/her?
- (16A) How much advice do you seek from each other on personal problems?
- (17P) How efficient is his/her contribution on the jobs for which the two of you work together?
- (18L) How much is his/her work activity supported by other members of the group?
- (19A) How much do you discuss your personal matters with each other?
- (20L) How much is his/her work activity valued by other members of your group?
- (21P) How useful is his/her effort on the jobs that are to be done together by you and him/her?
- (22A) How much interest do you take in solving each other's problems?
- (23A) How much importance do you attach to each other's advice on personal matters?
- (24P) How much initiative does he/she take in solving the problems to be done together by you and him/her?

B. (LMX). The following questions relate to your immediate supervisor. Please answer them by choosing one of the four alternatives given with each question. Choose the alternative that best describes your relationship with your immediate supervisor.

- (1) How flexible do *you* believe *your* supervisor is about evolving change in *your* job?
  - (4) Supervisor is enthused about the change.
  - (3) Supervisor is lukewarm to change.
  - (2) Supervisor sees little need to change.
  - (1) Supervisor sees no need to change.
  
- (2) Regardless of how much formal organizational authority *your* supervisor has built into his/her position, what are the chances that he/she would be personally inclined to use his/her power to help *you* solve problems in your work?
  - (4) He certainly would.
  - (3) Probably would.
  - (2) Might or might not.
  - (1) None.
  
- (3) To what extent can *you* count on *your* supervisor to “bail you out” at his/her expense, when *you* really need him/her?
  - (4) Certainly would.
  - (3) Probably would.
  - (2) Might or might not.
  - (1) None.
  
- (4) How often do you take suggestions regarding your work to your supervisor?
  - (4) Almost always.
  - (3) Usually.
  - (2) Seldom.
  - (1) Never.

(5) How would you characterize your working relationship with your supervisor?

- (4) Extremely effective.
- (3) Better than average.
- (2) About average.
- (1) Less than average.