A field study of 84 registered nurses and their supervisors revealed that leaders' perceptions of leader-follower attitudinal similarity and follower extraversion were positively related to the quality of leader-follower exchanges. Neither followers' locus of control nor growth need strength was found to be significantly correlated with the quality of the exchange between leaders and followers.

The leader-member exchange (LMX) model has been offered by Graen and his colleagues (e.g., Graen & Wakabayashi, 1994) as an alternative approach to the study of leadership. In contrast to traditional models that imply that a leader exhibits a similar leadership style toward all members of a work group, the LMX model suggests that leaders may develop different types of relations with different members of the same work group. In this respect, the model depicts leader-follower relations (exchanges) as existing on a continuum ranging from high to low quality.

Despite a growing stream of research on the leader-member exchange model, there has been no clear explication of personal or interpersonal attributes associated with high-quality exchanges (Yukl, 1989). Because the quality of leader-follower exchanges tends to develop quickly and remain stable over time (Liden & Graen, 1980), it is conceivable that such attributes, deduced from early leader-follower interactions, are associated with the quality of subsequent leader-follower relations. Accordingly, the purpose of the reported study was to investigate selected personal and interpersonal attributes that LMX theory and research suggest may be associated with exchange quality. As Yukl and Van Fleet (1992) noted, the LMX model is primarily descriptive, not prescriptive. That is, it does not attempt to relate leader-member exchange quality and leadership effectiveness. Rather, it examines the antecedents and consequences of leader-member exchange level to more fully describe leader-follower relations. Thus, the identification of...
personal and interpersonal attributes related to exchange quality is important for both the theoretical development of the LMX model and its practical application.

**ATTRIBUTES SELECTED FOR INVESTIGATION**

Numerous personal and interpersonal attributes may be associated with exchange quality. The four attributes selected for investigation here are fundamental dimensions that underlie human interactions. Furthermore, each has been widely used to explain differences in various employee attitudes and behaviors. Finally, as previously noted, current LMX theory and research suggest that each may be associated with exchange quality.

**Attitudinal Similarity**

Similarity is one of the most central theoretical and empirical constructs in cognitive psychology (Medin, Goldstone, & Gentner, 1993). Within the field of management, the similarity-attraction effect provides the conceptual foundation for much research on organizational demography (Tsui, Egan, & O'Reilly, 1992). The LMX model suggests that attitudinal similarity is an important influence on leader and follower interactions, being a prime determinant of successful ongoing relationships. To date, only one study (Liden, Wayne, & Stilwell, 1993) has investigated the influence of similarity on the quality of leader-follower exchanges. Leader-assessed similarity was not associated with the quality of follower-reported leader-member exchange in that study. However, given that this is the only research in this area and the importance of attitudinal similarity in other interpersonal interactions (see Byrne [1971] for a review), it remains a presumptive input to leader-follower exchanges.

*Hypothesis 1: Leaders' perceptions of leader-follower attitudinal similarity will be positively related to leader-member exchange level.*

**Introversion and Extraversion**

Years of research have convinced many investigators that the twin constructs of introversion and extraversion are a central dimension of personality (McCrae & John, 1992). Introversion/extraversion is a broad dimension that deals with the interpersonal activity so important in leader-follower relations. Adjectives used to exemplify extraversion include active, assertive, dominant, venturesome, lively, sociable, sensation-seeking, and carefree. Research indicates that extraverts seek interaction with others, novel experiences, and complex, varied, and intense stimuli. In contrast, introverts tend to prefer their own company or that of habitual companions and follow predictable paths, avoiding excessive sensory input (Eysenck, 1986). To the extent that the LMX model suggests that followers are able to influence the quality of their interactions with leaders, it is possible that extraverted followers, seeking interpersonal relations, would attempt a high level of inter-
action with leaders not only to gain the satisfaction of interacting, but also to enhance the possibility of being assigned stimulating tasks. Such behavior corresponds closely with that underlying high-quality leader-follower exchanges.

Hypothesis 2: Follower extraversion will be positively related to leader-member exchange level.

Locus of Control

Research has repeatedly shown locus of control to be an important construct for explaining workplace behavior (Spector, 1982). Individuals with an internal locus of control generally feel that they can control events in their lives and perceive personal initiative to be largely instrumental in attaining success. In contrast, individuals who generally feel that outside or environmental forces determine what happens in their lives, who are said to have an external locus of control, ascribe little or no value to initiative because they view success as to some extent unrelated to effort.

Of interest here is the tendency of those with an internal locus of control (henceforth, internals) regarding situational control (Strickland, 1989). That is, because internals believe they can control a work setting through their own initiative and independence of action, they should attempt to achieve more control than do externals if they believe the control will lead to desired outcomes. Thus, as Spector (1982) predicted and Blau (1993) reported, internals will probably attempt to control performance outcomes via initiative-based rather than compliant behaviors. Initiative-based behaviors could include attempting negotiations relating to operating procedures and policies, work assignments, working conditions, and work schedules. In the leader-member exchange model, such leader-follower negotiation is characteristic of high-quality exchanges. In this respect, internals would be more likely to view negotiating and other forms of initiative-based behavior as instrumental to controlling desired outcomes.

Hypothesis 3: Follower locus of control will be related to leader-member exchange level, with an internal locus of control associated with a high level.

Growth Need Strength

Growth need strength is a personal attribute that concerns a person's desire to grow and develop as an individual. As an explanatory construct, growth need strength is a central concept in understanding the influence of job characteristics (Kulik & Oldham, 1988). Graen and Scandura (1987) contended that having some work group members with job-growth potential (ability) and the motivation to accept challenges beyond their job descriptions contributes to the success of leader-follower exchanges. Because followers in high-quality exchanges receive greater job latitude and more challenging assignments than those in low-quality exchanges, it is reasonable to
investigate the relation between growth need strength and leader-member exchange level.

Hypothesis 4: Follower growth need strength will be positively related to leader-member exchange level.

METHODS

Respondents

The research population was composed of 130 full-time registered nurses and their supervisors employed in 12 work groups at a large hospital in the southern United States. Eighty-four nurses (followers) and 12 supervisors (leaders) completed questionnaires, resulting in a response rate of 68 percent. We determined sample representativeness by comparing leaders' assessments of perceived leader-follower similarity and follower performance (both described below) for both respondents and nonrespondents. Results of an independent samples t-test revealed no significant difference in either variable for the two groups. As an additional check on representativeness, we computed a correlation between the number of respondents and the number of individuals in the target population for each of the 12 work groups ($\bar{x} = 10.83$, s.d. $= 6.22$, range $= 5-24$). The correlation was .80 ($p < .01$), indicating that large numbers of respondents came from the large groups.

The leaders were mostly women (83%) and had an average age of 39.4 years. The majority (83.3%) held at least an undergraduate degree. Their average organizational tenure was 10.7 years, and their average tenure in their current positions was 5.7 years.

The followers were also mostly women (88.1%) and had an average age of 36.7 years. The majority (76.2%) held at least an undergraduate degree. Their average organizational tenure was 6.7 years, and they averaged 3.8 years in their current positions and 1.9 years working for their current supervisors.

Measures

LMX level. We used the Leader-Member Exchange Scale (Graen, Liden, & Hoel, 1982) to measure LMX level. This scale, completed by followers, consists of seven items with a five-point multiple-choice response format. We summed responses across items to obtain an overall score, with high scores indicative of higher-quality relations. Cronbach's alpha was .87.

Research on the leader-member exchange model has often used raw leader-member exchange scores as a dependent variable. Because the LMX model focuses on within-group differences in leader-follower relations, data analysis should likewise reflect a within-group approach. Accordingly, we computed a deviation score (cf. Dockery & Steiner, 1990) for each group member by subtracting the relevant work group's average LMX score from
the group member's score. These deviation scores were used as a continuous measure of follower leader-member exchange level.

Despite their popularity, the appropriateness of deviation scores for estimating differences between measurement units continues to be a source of much debate (Bedeian, Day, Edwards, Tisak, & Smith, in press). Some authors have advised that the statistical and psychometric properties of deviation scores are so problematic that their use should be discontinued (e.g., Edwards, in press). Others have concluded that such criticisms are unfounded, declaring deviation scores to be both reliable and unbiased (e.g., Smith & Tisak, 1993). Weighing arguments favoring both positions and recognizing the grounding of our research in Graen's leader-member exchange perspective, we judged deviation scores appropriate for use.

Because leader-member exchange level, the dependent variable, and several of the study's independent variables were assessed using single-source self-reports, common method bias was a potential confound. To provide a response check on such bias, we used leader rankings to verify follower-reported LMX level. Leaders were asked to rank followers, listing first those with whom they worked best or most successfully and then those with whom they worked worst or least successfully. Both Dockery and Steiner (1990) and Duchon, Green, and Taber (1986) have demonstrated convergent validity between such leader rankings and follower-reported LMX level.

In the present study, we assessed agreement between follower-reported leader-member exchange scores and leaders' rankings of their followers in terms of exchange quality in two ways. First, an independent samples t-test indicated that the self-reported LMX scores of followers designated by leaders as those with whom they worked best and worst were significantly different and in the expected direction ($t = -2.75, p < .01$). That is, followers ranked in the upper third had significantly higher LMX scores ($\bar{x} = 29.54$) than followers ranked in the lower third ($\bar{x} = 26.54$; Dockery & Steiner, 1990). Second, following the procedure outlined by Duchon and colleagues (1986), we found that leader rankings were significantly correlated with follower-reported LMX scores ($r = .35, p < .01$). Because the leader rankings and follower reports corresponded, we used only the latter (converted to deviation scores) in subsequent statistical analyses.

**Attitudinal similarity.** Previous research indicates that perceived similarity is more important in leader-follower relations than actual similarity (Wexley, Alexander, Greenawalt, & Couch, 1980). Given that research, we asked the leaders in the present study to assess the similarity between themselves and their followers in terms of six items dealing with attitudes on family, money, career strategies, goals in life, education, and overall perspective. All six items had response alternatives ranging from "strongly agree," 5, to "strongly disagree," 1. We computed scores by summing across items, with higher scores indicative of similarity. Cronbach's alpha was .81.

**Introversion/extraversion.** We assessed follower introversion or extraversion using Eysenck's (1958) questionnaire and computed scores by adding item ratings (possible range, −6 to +6), with high ratings indicating
extraversion. Because the Eysenck questionnaire is a heterogeneous measure, internal consistency reliability estimates are inappropriate for judging the proportion of introversion/extraversion score variance that is due to error. Eysenck and Eysenck (1975) did, however, report an introversion/extraversion test-retest reliability over one month of .89.

**Locus of control.** A short form (Valecha, 1972) of Rotter's (1966) I-E Scale was used to assess followers' locus of control. Containing 11 paired items, this forced-choice instrument has psychometric properties similar to those of the original Rotter scale. Each item pair includes one statement more representative of persons having an internal locus of control and one more representative of persons having an external locus of control. Respondents choose one item from each pair. We assigned one point for each external statement chosen and computed scores by summing across these items, with lower scores indicative of internal locus of control.

Split-half and Kuder-Richardson reliabilities were computed, although both tend to underestimate scale reliabilities (Rotter, 1966). That is, because the I-E Scale is additive and its items are not comparable, split-half reliability tends to underestimate its internal consistency. KR-20 reliability is likewise limited in the present case because the I-E Scale is a forced-choice instrument that attempts to balance alternatives so that the probabilities of endorsing either alternative do not include more extreme splits (Rotter, 1966: 10). The split-half reliability was .72; the Kuder-Richardson reliability was .61.

**Growth need strength.** Follower growth need strength was assessed using the job choice section of the Job Diagnostic Survey (JDS; Hackman & Oldham, 1975). Followers were asked to indicate their relative preference for 12 pairs of hypothetical jobs. For each case, a statement describing a job with characteristics indicating growth need strength is paired with a statement describing a job with characteristics indicating an alternative need, such as affiliation or job security. The paired jobs serve as anchors for opposite ends of a five-point scale, with choices ranging from "strongly prefer A" to "strongly prefer B." We summed responses to compute an overall score, with high scores indicating high growth need strength levels. The ipsative nature of this measure renders internal consistency estimates inappropriate. Graen, Novak, and Sommerkamp (1982), however, reported a growth need strength test-retest reliability (over six months) of .65.

**Control variables.** Six potential covariates were controlled to prevent potential confounding: age, gender, organizational tenure, work group size, education, and performance. Previous studies (e.g., Judge & Ferris, 1993; Tsui et al., 1992) have identified these variables as being related to supervisors' affect toward subordinates. Thus, including controls was necessary to ensure that we obtained the effects of the focal independent variables even when considering the effects of the specified covariates. Age and organizational tenure were measured in years. Gender was measured by a dichotomous variable, with 0 designating men and 1 designating women. Education was coded on a seven-point basis ranging from "less than high school" (1) to
"doctor's degree" (7). Finally, each leader rated followers on a seven-item performance evaluation instrument that covered the areas of dependability, alertness, people skills, planning, know-how, present performance, and expected performance (Graen, Dansereau, & Minami, 1972). Each area was rated on a seven-point scale. Scores were computed by summing across items, with higher scores indicating higher performance levels. Cronbach's alpha was .91.

RESULTS

Table 1 reports variable means, standard deviations, measure reliabilities, and zero-order correlations among the study variables. Because of the different response scales represented, we standardized all independent variables prior to conducting statistical analyses. Of the four independent variables, two—attitudinal similarity and introversion/extraversion—were significantly correlated with leader-member exchange level ($r = .26$ for both) and thus were retained for further analysis.

To this end, follower-reported leader-member exchange level was hierarchically regressed on the six identified covariates and the retained independent variables. Table 2 shows the resulting main effects, reporting individual beta weights with their standard errors. The beta weights provide a rough estimate of the relative contributions of the independent variables in predicting LMX level. Both attitudinal similarity ($b = .27, p < .05$) and introversion/extraversion ($b = .23, p < .05$) were significantly related to follower-reported leader-member exchange level.

DISCUSSION

This study examined four personal or interpersonal attributes (leader-perceived follower attitudinal similarity, follower introversion/extraversion, follower locus of control, and follower growth need strength) hypothesized as being related to leader-follower exchange quality. Of these, attitudinal similarity had the strongest association with the quality of leader-follower exchanges. This finding is in marked contrast to results from the only other study to investigate perceived similarity in conjunction with leader-member exchange. Liden and colleagues (1993) found perceived similarity and leader-member exchange to be related only when both variables were assessed by the same source: leaders' perceptions of similarity were related to leader-assessed exchange level but not to follower-assessed exchange level. Future research on leader-member exchange development should further examine the association between perceived similarity and leader-member exchange.

Correlation and regression analyses indicated that follower extraversion was also positively related to leader-member exchange level. The literature on LMX theory emphasizes that leaders attempt to discover followers' relevant talents and motivations. Follower extraversion may make these obvious to leaders. Further, behavioral descriptions portray leader interactions with
TABLE 1
Means, Standard Deviations, Correlations, and Reliabilitiesa

<table>
<thead>
<tr>
<th>Variables</th>
<th>Means (s.d.)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Leader-member exchange level</td>
<td>27.85 (4.45)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Attitudinal similarity</td>
<td>18.20 (4.15)</td>
<td>.26</td>
<td></td>
<td></td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Introversion/extraversion</td>
<td>2.88 (2.98)</td>
<td>.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Locus of control</td>
<td>4.06 (2.03)</td>
<td>-.14</td>
<td>.03</td>
<td>.72</td>
<td>(.61)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Growth need strength</td>
<td>36.77 (6.11)</td>
<td>.17</td>
<td>.05</td>
<td>.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Age</td>
<td>36.69 (9.33)</td>
<td>.01</td>
<td>-.35</td>
<td>.04</td>
<td>-.13</td>
<td>.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Gender</td>
<td>0.88 (0.33)</td>
<td>.15</td>
<td>-.12</td>
<td>-.09</td>
<td>.03</td>
<td>.31</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Organizational tenure</td>
<td>6.28 (6.06)</td>
<td>.08</td>
<td>-.29</td>
<td>.00</td>
<td>.00</td>
<td>.03</td>
<td>.45</td>
<td>.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Group size</td>
<td>10.83 (6.22)</td>
<td>-.00</td>
<td>.22</td>
<td>.13</td>
<td>.06</td>
<td>.02</td>
<td>-.26</td>
<td>.06</td>
<td>-.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Education</td>
<td>4.10 (1.07)</td>
<td>.15</td>
<td>-.08</td>
<td>-.03</td>
<td>-.01</td>
<td>.06</td>
<td>-.04</td>
<td>-.03</td>
<td>.16</td>
<td>-.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Performance</td>
<td>36.85 (8.47)</td>
<td>.26</td>
<td>.39</td>
<td>-.18</td>
<td>-.10</td>
<td>.22</td>
<td>-.31</td>
<td>.24</td>
<td>-.02</td>
<td>-.02</td>
<td>-.01</td>
<td>(.91)</td>
</tr>
</tbody>
</table>

a n varies from 82 to 84. Correlations at or above ±.22 are significant at p < .05, two-tailed test.

b Values are for KR-20 and split-half reliability (in the order shown); other reliability estimates are coefficient alphas.
TABLE 2
Hierarchical Regression Analysis for Leader-Member Exchange Level

<table>
<thead>
<tr>
<th>Variables</th>
<th>Step 1</th>
<th></th>
<th>Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td></td>
<td>b</td>
</tr>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.14</td>
<td>.15</td>
<td>.13</td>
</tr>
<tr>
<td>Gender</td>
<td>.07</td>
<td>.15</td>
<td>.11</td>
</tr>
<tr>
<td>Organizational tenure</td>
<td>.00</td>
<td>.06</td>
<td>.12</td>
</tr>
<tr>
<td>Group size</td>
<td>.06</td>
<td>-.01</td>
<td>.11</td>
</tr>
<tr>
<td>Education</td>
<td>.18</td>
<td>.22*</td>
<td>.11</td>
</tr>
<tr>
<td>Performance</td>
<td>.30*</td>
<td>.21</td>
<td>.13</td>
</tr>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived similarity</td>
<td></td>
<td>.27*</td>
<td>.13</td>
</tr>
<tr>
<td>Introversion/extraversion</td>
<td></td>
<td>.23*</td>
<td>.11</td>
</tr>
<tr>
<td>df</td>
<td>6.72</td>
<td>8.70</td>
<td></td>
</tr>
<tr>
<td>Overall F</td>
<td>1.73</td>
<td>2.95**</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.13</td>
<td>.25</td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td></td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>$F(\Delta R^2)$</td>
<td></td>
<td>5.89**</td>
<td></td>
</tr>
</tbody>
</table>

* n = 82. Covariates were added as a group in step 1; independent variables were added as a group in step 2.

* p < .05
** p < .01

followers with whom they engage in high-quality leader-member exchanges as more frequent than the leaders’ interactions with lower-quality LMX followers. Extraverts, who are more likely than introverts to seek interaction, may thus tend to establish closer relationships with leaders. Additionally, extraverts’ desire for novel experiences may make them more likely to negotiate with leaders for increased responsibility, which is characteristic of followers in high-quality exchanges. Finally, leaders should be aware of this finding so that they do not overlook highly skilled but introverted followers.

Follower locus of control and growth need strength were not significantly correlated with follower-reported leader-member exchange and did not contribute significantly to the initial baseline regression equation. Thus, we did not include those variables in subsequent regression analyses. Use of nurses as respondents may have affected these results. Internals may attempt to exert more influence, and individuals with high growth need strength may be willing to take on extra challenges only if they see these behaviors as leading to desired outcomes or rewards. Graen, Novak, and Sommerkamp (1982) demonstrated that individuals with high growth need strength respond to reward contingencies with appropriately high or low productivity. Allowing for the well-documented nationwide shortage of nurses when this study was conducted, market forces may have affected respondents’ pay and other extrinsic rewards more than individual performance. Hence, use of nurses may not have afforded a complete opportunity to test reward-contingent behaviors. Nevertheless, growth need strength and performance
were uniquely correlated in the focal sample. Given the demonstrated importance of situational contingencies, locus of control and growth need strength should be examined in future leader-member exchange research.

As with any study, potential limitations should be addressed. Most notably, we measured the personality variables of introversion/extraversion, locus of control, and growth need strength only for followers. Early LMX theoretical literature (Graen & Cashman, 1975) stressed the importance of leader-follower compatibility. People's characteristics need not, however, be identical for them to be compatible. Indeed, experienced leaders may purposefully select as key supporters work group members who complement, rather than duplicate, their own strengths. For example, an introverted leader may welcome the opportunity to assign a more extraverted follower tasks that demand social skills or interactions. However, given the demonstrated importance of followers' leader-perceived attitudinal similarity, such variables should probably be assessed for both leaders and followers. The only study to use this approach (McClane, 1991) found that leader-follower similarity in locus of control was unrelated to follower-reported leader-member exchange level. Nonetheless, certain combinations of these personal and interpersonal attributes of leaders and followers may affect the quality of leader-follower exchanges. Such combinations should be examined in future research.

The focus of this study was personal and interpersonal attributes associated with leader-follower exchange quality. Both leader-perceived follower attitudinal similarity and follower introversion/extraversion were found to be associated with higher-quality leader-follower relations, with those variables accounting for 25 percent of the variance in LMX level. Thus, it appears that both are important for explaining leader-follower exchange quality. At the same time, our data indicate that there is much yet to be learned about other variables related to high-quality leader-follower exchanges. Continued research employing other predictors, as well as diverse samples and measurement procedures, promises to contribute to a more complete understanding of the leader-member exchange model and its potential for practical application.

We have noted that identifying personal and interpersonal attributes related to exchange quality is important for both the theoretical development of the leader-member exchange model and its practical application. As regards the first, examining attributes that theory and research suggest are associated with exchange quality may clarify and strengthen the leader-member exchange model by strengthening the nomological net that may ultimately be used to determine its validity. With respect to the model's application, the current study offers potential means for improving the quality of leader-follower relations. Our results suggest that it may be possible to design programs that train leaders to counteract negative outcomes of low-quality exchanges, such as job dissatisfaction and dysfunctional employee turnover. Further, if personal attributes associated with exchange quality are identifiable, it may be possible to sensitize work group members to charac-
teristic behaviors indicating such attributes. Such knowledge could be important to group members’ career progression and to work group output.

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