CONTINGENCY THEORIES OF LEADERSHIP: ARE THEY MEANINGFUL?

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ABSTRACT

CONTINGENCY THEORIES OF LEADERSHIP:
ARE THEY MEANINGFUL?

By

Bruce Bernard Saari

Fifty-three leaders from four organizations along with equal-sized samples of peers and subordinates (one peer and one subordinate for each of the leaders) participated in a descriptive study of leadership behavior. The purpose of the study was the assessment of the feasibility of the determination of an empirical basis for the interactionist position of contingency theories of leadership. Such a base required the identification of groups or clusters of leaders who behaved similarly when faced with different kinds of leadership situations. Thus, the research attempted to locate clusterings of leaders, leadership situations, and leadership behaviors whose interrelationships could be explored in light of contingency theories of leadership.

Each of the participants in the study completed a questionnaire which measured the initiating structure and consideration behaviors of a given leader in ten leadership situations. The analysis of the leaders', peers', and subordinates' separate data sets employed three-mode factor analysis to identify the existence of clusters of people, behaviors, and situations. Upon completion of these analyses, a comparison of the obtained factor structures for people, behaviors and situations in the three data sets was accomplished by means of a

principal components analysis of multitrait-multimethod matrices. Respondent groups were the methods, and factor structures constituted the traits in these matrices. Finally, an ANOVA decomposition of multitrait-multimethod matrices from each of the respondent groups' data sets sought to determine whether individual differences in behavioral responses or situations were more effective in producing variance in a respondent group's data. In the matrices analyzed this way, behavioral responses made up the traits and situations were the methods.

The results of the analyses across respondent groups were highly similar. Large numbers of individual difference factors (11 to 13) were observed in each data set along with a few (2, 3, or 4) behavioral dimensions and only a single situation dimension. Such results indicate that contingency theories may be unnecessarily complex descriptive models of leader behavior. However, a situational main effect, as well as the strong-trait effect indicated by the large number of individual difference factors and the results of the ANOVA, did emerge. This fact led to the conclusion that a main class model employing these two constructs seems more appropriate than an interactionist model or a pure-trait model in describing leader behavior.

The research also indicated certain conclusions regarding 1) the strength of previous research on leadership behavior, 2) the appropriateness of this study's methodology for exploring interactionist perspectives, and 3) the implications of this study's results for leadership training. In relation to these topics it was concluded that: 1) previous leadership behavior research was supported by this study's findings; 2) this study's methodology appears useful in exploring

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three-way interactions which provide the basis for interactionist perspectives; and 3) short-term leadership style training is probably more useful in helping leaders change their level of specific behavioral responses rather than in altering their overall behavioral response patterns. Such major changes were considered to be more likely the result of long-term development efforts.

Finally, in light of these conclusions, possible future research efforts were discussed in relation to reproducing the present results, relating the present results to effectiveness measures and developing research efforts aimed at measuring leadership situations more precisely.

CONTINGENCY THEORIES OF LEADERSHIP: ARE THEY MEANINGFUL?

By

Bruce Bernard Saari

A DISSERTATION

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Department of Psychology

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ACKNOWLEDGMENTS

The object of education is the pursuit of knowledge; the joys of education are the relationships shared in that pursuit. Without friendships, my formal education would have been an empty experience. To each of my friends, relatives, colleagues and mentors who shared in this effort I can only say thank you. However, certain individuals deserve special commendation for their part in this process.

First, my gratitude must go to the four men on my committee who will always represent guideposts in my education. Each of these men exemplifies ideals I highly admire. Dr. Neal Schmitt, my chairman, epitomized, along with dedication and tenacity, the friend who is willing to share all he has to help someone grow. He taught me the benefits of having an unselfish mentor who is highly competent and capable of sharing his knowledge with others. Dr. Carl Frost taught me the value of allowing personal convictions to permeate the professional's personality whenever those convictions can complement one's work. Dr. Eugene Jacobson demonstrated the worth of always maintaining a current perspective on the entire field of one's endeavors. Finally, Dr. John Wakeley has continually exemplified the critical thinking and accuracy in thought and word necessary to the career of any professional. I only hope that I can incorporate the assets of these men in my own career.

Along with these four men, three other individuals contributed directly to the completion of this dissertation, and therefore deserve

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note. Bryan Coyle gave untold hours to develop computer programs that would perform the analyses required by this study. Words of thanks are not enough to repay him for all his efforts but hopefully the friendship we have shared will be as meaningful to him as it has been to me. Similarly, to Janis Seiber and Carol Repko who both aided in the actual conduct of the research I extend my deepest thanks.

Finally, to the one individual who made my graduate education a veritable joy even on days when things went poorly, I offer my love as well as my thanks. Although she never sat in a classroom with me or studied for a test with me, my wife, Cindy, has had as large an impact on my education as anyone. To her, I offer the rest of my career as some small token of my gratitude for her perseverance during these difficult but exciting years of our life.

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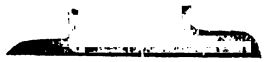

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INTRODUCTION

The Trait-Situation Controversy in Psychology

"The devil made me do it," has recently been the vogue response for someone caught doing something out of character. While the phrase has become a cliché, it emphasizes a question which, in another form, is a central concern of psychology, especially in the areas of personality and interpersonal behavior. This concern focuses on identifying the primary source of variance in behavior. That is, it inquires whether behavior is controlled by situational factors external to the individual, or by factors within the individual.

Like the apparent response of the cliché, some psychologists argue that situational or environmental factors are the primary controllers of behavior or overt personality. They contend that situational parameters greatly influence behavior and thereby account for more of the variance in behavior than do intraindividual factors. Some of these situational psychologists' views are equivalent to the extremely behavioristic position of operant conditioning as espoused by Skinner (1971). For others, their perspective is more closely related to the rather moderate approach of social learning theory (e.g., Bandura, 1969). But common to all is the belief that behavior is primarily a function of external variables or stimuli. Situationists search for laws of behavior which are based on the ability of situational factors to explain the variance in human behavior. As Boring (1963) has indicated, the ultimate

end of such perspectives would be to reduce variance in behavior to zero by explaining, and thus controlling, all behavioral differences as a function of situational variance. In essence, this becomes a purely deterministic view of behavior similar to that proposed by Skinner (1973).

Alternately, other psychologists argue that behavior is a function of individual traits. Such a position is analogous to a metaphysical approach to the above cliché which argues that the devil's residence is within the actor. Trait psychologists contend that variance in behavior is attributable to individual difference variables which cause a given individual to behave more or less consistently across different kinds of situations. These individual difference variables are characterized by Allport (1966), a prominent trait psychologist, as "cortical, subcortical or postural dispositions having the capacity to . . . guide specific phasic reactions . . . (They) include long range sets and attitudes . . . (p. 3)." For the trait psychologist, variance in behavior arises as a result of variations in individuals' differential possession of a given trait, not as a function of the situation the individuals are in. The ultimate conclusion of this perspective is an explanation of variance in behavior based on variance in people, not on variance in situational parameters. Thus control, or reducing behavioral variance to zero, is dependent on identifying, understanding, and controlling a myriad of individual difference variables.

In recent years there has been a definite shift in the popularity of these two opposing perspectives. If one only considers the rising popularity of behaviorism in both academic and applied arenas, it is easy to conclude that the situational school is growing, while the trait positions that were prominent early in the history of psychology are

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decreasing in popularity. Even Allport (1966) recognizes the rising popularity of the situationist perspective as he identifies some of the more classic statements of this position (e.g., Helson, 1964; Skinner, 1953; Stouffer, et al., 1949) which have appeared in the last 25 or 30 years.

As Bowers (1973) notes, this trend toward situationism may be a sorely needed response to the trait theories which dominated much of the developmental period of psychology. Data gathered in support of these theories typically results in the explanation of only 10 or 15 percent of the variance in observed behavior by trait variables (e.g., Alker, 1972). Similarly the situationists' criticism of this lack of explanatory power attests to the weaknesses of pure trait theories. But Bowers also points out a potential danger in overreacting. He argues that excessive concern with situationism might be equally detrimental to the advancement of psychology. Such an emphasis may equate psychological science with the experimental methods of situational control while ignoring the importance of individual differences in this study of human behavior. Traditionally, others such as Cronbach (1957), have expressed a similar concern. In response to this potential overreaction, Bowers proposes an interactionist view of behavior. Such a view explains the variance in observed behavior by way of an interaction between situational variables and intraindividual variables. That is, an interactionist position contends that the effect of situational variables on behavior is, to some extent, controlled by the individual difference variables that are present in the given situation. Alternately, individual difference variables' effects may be affected by the existing situational parameters. Specifically, Bowers argues for such an interactionist approach to personality development.

One of Bowers more vocal adversaries is Mischel (1973) who recognizes the possible impact of intraindividual variables, but argues that such effects are so highly idiosyncratic that to attempt a scientific investigation of them is difficult. He argues that psychologists' time would be better spent focusing on situational factors which are probably less idiosyncratic and more readily researched. Importantly, many psychologists agree with Mischel as has already been noted.

While Bowers and Mischel argue their positions from theoretical and empirical bases, others have taken a more purely empirical tack in addressing this issue. Generally, the proponents of any position (situationist, trait, or interactionist) have based their arguments on research designs which allow some assessment of the contribution of either traits, situations, or a trait X situation interaction to the total variance in the dependent variable under observation. Typical among these approaches are the source of variance designs proposed by Endler (1973) and Medley and Mitzel (1963) in which the contributions of traits and situations are assessed, usually by the calculation of omega (ω^2) or eta (η^2) (Hays, 1963). Of course, those researchers finding traits contributing a greater proportion of the total variance argue for a trait approach. The situationist and interactionist positions are similarly established based on these respective components' contributions to the total variance.

Some Methodological Difficulties in the Resolution of the Trait-Situationism Controversy

Recently, Golding (1975) has pointed out some difficulties surrounding the use of ω^2 or η^2 as the basis for these arguments. His position is that the desired result of these studies is the development

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of an ability to generalize consistently across a universe of persons in a given situation (a situationist position) or across a universe of situations for a given person (a trait position). He notes that the achievement of perfect generalizability in either case is indicated by the achievement of consistency. He argues that "while omega-squared ratios do technically index the percentage of total variation, they do not index the theoretically desired property of consistency" (P. 281). He points out that such a consistency index is available in Cronbach, et al.'s (1972) coefficient of generalizability. Unlike the ω^2 or η^2 ratios which use total variance as a denominator, the coefficient of generalizability only uses the variance components which involve the factor defining the variance term in the numerator as part of its denominator. Thus, while situational variance contributes to total variance and would be a part of the ω^2 or η^2 denominator for a test of the effect of traits, this main effect variance is really irrelevant to the issue of trait consistency and thus is not included as a factor in the denominator of a coefficient of generalizability which indexes the consistency of such trait effects. Naturally, coefficients of generalizability will always be larger than ω^2 or η^2 to the extent that such irrelevant main effect or interaction effect variances are large. But this increase in size seems appropriate if one is concerned with the consistent variance in certain relevant elements in an analysis of variance rather than with the composition of all the variance in the entire design.

Expanding this discussion, Golding deals directly with the Bowers vs. Mischel controversy by pointing up the need for more careful evaluation of the data base used in arguing for or against an interactionist position. The essence of his remarks is summarized when he says:

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> Bowers' (1973) position . . . requires a demonstration that the obtained interactions can be meaningfully decomposed into replicable patterns that are not highly idiosyncratic. Similarly, Mischel's (1973) interpretation cannot be given any credence without a demonstration that the obtained interactions are <u>not</u> systematic or patterned (p. 285).

He then discusses methods which might be appropriate in evaluating such an argument.

While such methods are worthy of discussion, the first concern of the following paragraphs is to examine the impact of Golding's comments on another area of psychology, the study of leadership. It will be shown that a controversy similar to the one expressed by Bowers and Mischel exists in the leadership area, and that its resolution is affected by Golding's remarks. Once this is accomplished, a research paradigm will be developed to explore this trait x situation interaction issue in the study of leadership. This later discussion will involve Golding's suggestions concerning methods for evaluating such arguments.

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A HISTORY OF LEADERSHIP RESEARCH

Early Leadership Research

In the arena of organizational psychology, at least one topical area has experienced the advocacy of both sides of the trait-situation controversy during the course of its history. That area is the study of leadership. Periodically it has been argued that traits, situations, or some interaction of the two is primarily responsible for effective leader behavior. While not emphasizing the bipolar extremes of the argument concomitantly, the history of this topic has been marked by theorists occupying one extreme position or the other. Since the literature surrounding much of this history has been the subject of several reviews (e.g., Stogdill, 1974a; Korman, 1966) and is fairly well-known, an exhaustive review of this information does not seem necessary for the present discussion. Rather a brief sketch of major points should suffice, with heavier emphasis being given to the more contemporary issues which are more directly affected by Golding's comments.

Much like the area of personality, the early studies of leadership were heavily influenced by a trait-oriented approach. It was hypothesized that success as a leader is controlled by the possession of certain biologically-based, intraindividual characteristics. This view failed to generate strong support since the data gathered to test these notions were typically inconclusive (Stogdill, 1948; Gibb, 1947). In some studies traits such as I.Q., physical size, and age were positively related

to success as a leader while other studies found no such relationship. Some studies actually demonstrated negative relationships. Such findings made a purely trait-oriented approach untenable.

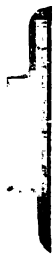
The inadequacies of this biologically-based trait approach to leadership prompted a more behavioral view of the problem. Soon the important individual difference variable became a behavioral response pattern rather than a biologically determined characteristic. Around 1950, this emphasis focused research on identifying the basic dimensions of leader behavior. These empirical efforts are best characterized by the work done at Ohio State University and at the University of Michigan. In both places, primary concern was placed on understanding the behaviors in which successful leaders engaged, but each took a slightly different approach to the problem.

At Ohio State, Hemphill, Fleishman and their associates developed a 150 item questionnaire on leader behavior called the Leader Behavior Description Questionnaire (LBDQ). This instrument was administered to subordinates who used it to indicate their perceptions of their leader's behavior. When these data were submitted to preliminary factor analysis, two major dimensions of leader behavior emerged (Fleishman, 1953)--consideration and initiating structure. Several other dimensions also emerged but have been largely ignored because they were not nearly as important in accounting for the total variance of the questionnaire as were the first two dimensions. The most widely accepted definitions of these two major dimensions come from Fleishman and Harris (1962):

> Consideration includes behavior indicating mutual trust, respect, and a certain warmth and rapport between the supervisor and his group. This does not mean that this dimension reflects a superficial "pat-on-the-back," "first name calling" kind of human relations behavior. This dimension appears to emphasize a deeper concern for group members' needs and includes such behavior as allowing subordinates more participation in decision making and encouraging more two-way communication.

> Structure includes behavior in which the supervisor organizes and defines group activities and his relation to the group. Thus, he defines the role he expects each member to assume, assigns tasks, plans ahead, establishes ways of getting things done, and pushes for production. This dimension seems to emphasize overt attempts to achieve organizational goals.

During the period that the Ohio State research was being conducted, Likert, Katz and others at the University of Michigan's Institute for Social Research were addressing the problems of leader behavior in a slightly different fashion. In the home office of a major insurance company, the researchers from Michigan focused on the behavior of leaders who were associated with either high or low producing groups of subordinates. Work groups or sections were paired on several variables to assure similarity. However, groups in a pair were selected to differ with respect to production rates. One group in each pair was identified as high producing (based on production records) while the other was low producing. The researchers found that supervisors of high producing groups differed from those of low producing groups in that high production supervisors reported engaging in more "employee-centered" behavior while the low production supervisors reported more "production-centered" behavior. Supervisors of the two groups did not differ on several demographic variables (Katz, Maccoby, & Morse, 1950). The reader should note the similarity of the behavioral dimensions developed by the two separate research efforts. Also similar to the Ohio State studies was the finding of additional factors or behavioral dimensions in the Michigan research. Typically, four factors are used to describe the University of Michigan's results. Bowers and Seashore (1966) summarize these as leader behaviors related to 1) differentiation of supervisory role, 2) closeness of supervision, 3) an employee orientation, and 4) developing group relationships.



These two early researches on leader behaviors proved to be the progenitors of a voluminous body of research that has focused on various aspects of these behavioral dimensions and their relationships to various organizational variables and criteria. The reader is again referred to the more exhaustive reviews noted above if interested in the specifics of these families of studies. However, the important implication of these research efforts for the present discussion is that they were an initial departure from the confines of the early biological trait theories. The studies do not represent a major swing to the situational school in that they still imply behavioral, rather than biological, traits. But the emphasis has started to shift. These studies succeeded in focusing concern on the description of leader behaviors rather than on the assumption that people with certain traits were leaders no matter what kind of behavior they exhibited.

A direct practical application of these research efforts has come from the work of Blake and Mouton (1964). These practitioners advocate the desirability of leaders being high on both task and people orientation, reasoning that such a person should be able to optimize the organization's goals while maintaining maximum concern for his/her subordinates. Accordingly, they have developed a program to train leaders to be high on both orientations. It is called "Managerial Grid Training" because the primary educational device is a grid, formed by labeling a pair of orthogonal axes as continua on which the two behavioral dimensions are measured. Given this grid format, the technique assumes that every manager occupies some position on each of the two scales (each is labeled low--1 to high--9) which can be assessed by a short questionnaire scored from 1 to 9 on each dimension. The manager completes this questionnaire early in a training session. After establishing the managers' individual

location in the grid by way of this questionnaire, the training then attempts to teach leaders to move to higher (and possibly more stable) positions on both dimensions. Of course, the simultaneous achievement of the 9 level on both dimensions is considered the ideal end result. Clearly, such a training approach still classifies as a trait-oriented approach to leadership. That is, the method seeks to develop behavioral styles or traits in managers on the assumption that there is one style (high levels on both dimensions) which best accommodates the handling of all situations. This program has experienced a great deal of success as an approach to management development.

A similar practical extension of the Michigan research was embodied in Likert's theoretical and operational development of his System One to Four notions (1961) and the survey feedback technique of developing a "System Four" organization. Based on the Michigan findings, Likert advocated developing managers and organizations in the direction of more employee-centered behavior. This orientation is desired because of its ability to enhance productivity more effectively than does production-centered behavior. Achievement of such an employee-centered stance defines a System Four position while lesser degrees of employee orientation coupled with more production-oriented behaviors define Systems One to Three (System One being the most production-oriented and least employee-centered). Note that each system is more effective in prompting productivity than the one which numerically proceeds it. Thus, all four focus on production, but System Four is the most useful in terms of advancing the group's productivity. In essence, Likert proposed that development toward the System Four position could be accomplished by 1) surveying an organization thereby measuring the organization's present position, 2) feeding back the results of the survey at various organizational levels,

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3) planning, at each organizational level, how the problems identified in the survey might be remedied, and 4) carrying out the plans and repeating the cycle.

These descriptions of Likert's and Blake and Mouton's approaches are at best brief but they provide illustrations of the behavioral trait assumptions that resulted from the Ohio State and Michigan research. Both practical applications are advocacies of normative leadership models based on behavioral style or trait positions.

With approaches such as these came the questioning of whether such simplistic definitions of desired leader behavior were in fact appropriate in all situations. It is with this question that the study of leadership began to focus on the possibility of situational parameters as a factor in the enactment of successful leader behavior. Such a focus raised a two-sided issue. First, are unilateral approaches, such as Blake and Mouton's or Likert's, appropriate to all situations? Second, are behavioral styles actually consistent within a given leader across several situations? Soon the leadership behavior problem was cast in the same light as the trait-situation controversy in personality research discussed above. If situations could be unilaterally approached, a trait or style view of leader behavior would suffice. If individuals were not consistent across situations, a situationist position might be adequate. Alternatively, some interaction between the effects of traits and situations might be more appropriate. Since this latter option seemed most reasonable, the pure trait and situation positions were less carefully considered and research and theorizing began to focus on the plausibility of an interactionist approach to leadership behavior. It is in relation to this body of work that Golding's comments noted above are most

applicable. Therefore, a more careful development of these efforts will be presented.

Trait x Situation Interaction Issues in the Study of Leadership

One of the earliest theoretical definitions of the interaction position was presented by Tannenbaum and Schmidt (1958). They posited that a leader was capable of choosing a leadership behavior pattern or style to accommodate his present circumstances. They argued that there were basically three forces impinging on such a choice. These forces differed in their origin and were considered to come from a) within the leader, b) within the leader's subordinates, or c) within the situation the leader was in. While this model of leadership may be intuitively appealing, it did little to stimulate research in the area. Similarly, it had little impact on the trait x situation interaction controversy except to actually identify its existence. Like the leader behavior research of the early 1950's discussed above, this was a developmental factor in changing theoretical notions regarding the effects of traits and situational factors on leader behavior.

A few years later, Fiedler (1964) proposed a trait x situation interaction position called "The Contingency Model of Leadership Effectiveness." While the Tannenbaum and Schmidt notions engendered little research during their first six years of existence, this model, after a similar time period, generated a large enough body of research to warrant review. Fiedler (1971) reports this review, and discusses 25 studies which were considered tests or extensions of his model. More recently he stated that "the model has given rise to well over 100 empirical studies" (Fiedler, 1974, p. 65).

While the sheer quantity of research surrounding this model may provide some reason to consider it a major factor in the trait x situation

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interaction discussion, at least one cadre of researchers (Graen, et al., 1970; Graen, et al., 1971a and 1971b) would argue that the quality of this body of research and its ensuing interpretations are suspect and require closer scrutiny before Fiedler's model is awarded respect. The Graen, et al. position is that careful interpretation of this research "casts grave doubt on the plausibility of the contingency model" (1970, p. 295). But apparently, their arguments have not been entirely convincing. In his 1974 paper, Fiedler references seven studies that have publication dates later than the Graen, et al. arguments.

While the research discussed below will focus on the plausibility of some trait x situation interactionist or contingency view of leadership behavior, a theoretical resolution of the Fiedler vs. Graen et al. controversy seems beyond the scope of this discussion. Rather, the tenacity of Fiedler's notions in the face of what are considered by some to be insightful, if not fatal, criticisms demonstrates the rather classic nature of Fiedler's work. The model still demands attention. Therefore we must give it some consideration as a viable approach to the trait x situation interaction issue. A salient question persists. What is Fiedler's model? Let us move on to explicate its definition and component parts.

Simply stated, Fiedler's model posits "that the effectiveness of a group is contingent upon the relationship between leadership style and the degree to which the group situation (is favorable to the leader)." The hypothesized relationship is curvilinear. Task-oriented leaders will be effective in highly favorable and highly unfavorable situations. Relation-oriented leaders will be effective in moderately favorable situations (Fiedler, 1967, pp. 14-15). While the words used in this definition may be interpreted in several ways, many have rather singular

definitions with respect to the model. In the following paragraphs, these specific definitions are examined to assure an accurate understanding of Fiedler's model. Particularly in need of discussion are his operationalizations of effectiveness, group, leadership style, group situation factors and the concept of situation favorableness.

Although effectiveness is first in this list of terms, its definition requires an initial understanding of Fiedler's concept of group. In his early comments on the model, he employs Campbell's (1958) definition of a group. A group is some set of individuals bound together by a common fate, i.e, the individuals are interdependent in that what affects one member is likely to affect all. Fiedler expands this definition by identifying three types of groups: interacting, coacting and counteracting. These groups are differentiated on the basis of work relations between group members. In interacting groups, members are closely related and their efforts must be coordinated to reach some primary goal. Coacting groups are those in which members act rather independently in the attainment of a common goal. Finally, counteracting groups are those in which members work to negotiate or reconcile conflicting positions. Although it was Fiedler's intention to develop the model in relation to all three types of groups, most of the data from which the model was derived came from interacting groups. Therefore, the model is primarily related to those factors influencing the level of effectiveness achieved by such groups. This makes coordinated group effort in the attainment of a goal or the accomplishment of a task a crucial construct in the model. Note, however, that Fiedler has more recently explored the model's relation to other kinds of groups, especially those defined as coacting (e.g., Fiedler, 1971), and he argues for its extension to these conditions.

From his definition of group, Fiedler's concept of effectiveness follows directly. A group is effective to the extent it achieves its goal or objective. It is Fiedler's contention that this goal is generally measured as a product coming from the group. He notes that occasionally the group's goal may be internally focused (e.g., it may be the group's goal to improve such things as member satisfaction or morale), but group effectiveness is usually operationalized as some output measure when Fiedler's model is being researched.

While neither of these first two definitions is particularly unique or conceptually abstract, the remaining three concepts are a little more complex. For example, leadership style is defined by Fiedler as "the underlying need-structure of the individual which motivates his behavior in various leadership situations" (Fiedler, 1967, p. 36). He uses the term style to refer to a motivational pattern which is consistent over situations. This is somewhat different from standard usage in which style refers to a manner of acting or expressing oneself, implying consistency of actions over situations. According to Fiedler's usage, different behavioral exhibitions in different situations could exist in accord with a single leadership style. He argues that this possibility is a crucial element in understanding his model (1967, p. 36).

Because his definition of leadership style is related to what is typically considered a personality construct, it is not surprising to find Fiedler operationalizing leadership style with measures similar to those used in the study of personality. His measure of leadership style is called Least Preferred Coworker (LPC). The leader's style is assessed by measuring the leader's perceptions of his/her least preferred co-worker. Fiedler's (1967) discussion of the development of this measure is beyond the scope of the present discussion, but we must be concerned

with the final instrument and its interpretation. LPC is measured on a semantic differential scale of some 16 to 30 items, each of which uses an eight-point scale. Adjective pairs such as Friendly-Unfriendly, Helpful-Frustrating, Warm-Cold define the endpoints of each item's scale. Leaders completing the instrument are instructed to think of the person in their own past or present experience with whom they could work least well and characterize that person by checking a point along each continuum defined by the adjective pairs. Favorable adjectives such as friendly, helpful and warm are given a value of eight and their opposites get a value of one. Points in between are scaled from two to seven and a person's score on the LPC scale is obtained by summing the scale values of the checked continuum points for all adjective pairs.

The interpretation of these scores is interesting. When correlated with measures of group member adjustment, attitude measurements of the leader, and certain physiological and behavioral measures, few significant relationships were found. However, some relationships did appear when LPC was correlated with various motivational indices (Fiedler, 1967). In these cases, high LPC scores tended to relate to measures which indicated increased self-esteem rising from recognition by a group or from being well-liked by a group. Similarly, low LPC scores tended to relate to measures indicating a person's self-esteem was increased when a task was accomplished. Fiedler interprets these findings as follows. Leaders scoring high on the LPC scale are primarily motivated to achieve recognition and good group relations. These high LPC'ers are labeled relations-oriented leaders. Conversely, leaders scoring low on the LPC scale are primarily motivated by achieving goals. Low LPC'ers are called task-oriented leaders. Thus, Fiedler defines two leadership styles in relation to his model.

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In conjunction with his definition of leadership styles, Fiedler provides a means of identifying the leader in a group. The leader is "the individual in the group given the task of directing and coordinating task relevant group activities." The leader may be appointed, elected or that person who is most influential in directing the group to its own goal (1967, pp. 8-9).

This definition of a leader raises issues pertinent to the fourth and fifth crucial terms in the statement of the Contingency Model. Because Fiedler is primarily concerned with interacting groups, the leader's influence is a key element in accomplishing the group's task. The leader must be able to coordinate task-relevant group activity. Therefore, the salient elements in a group's situation for Fiedler's model are those factors which affect the leader's ability to influence the group. Given this fact, Fiedler identifies three dimensions along which a situation can be judged: the degree to which the leader possesses position power; the degree to which the task is structured; and the nature of the relationship between the leader and the follower group. Position power is defined as the authority the leader possesses by virtue of his/her identification as leader of the group. Task structure is the degree to which the group's task is ordered and the path to its solution is well-defined. Finally, the leader-group relationship is defined as the extent to which the leader can influence the group because of the members' need for affiliation with the leader.

It follows from this dimensionalization of situations that situation favorableness will be directly related to the amount of each of these factors in a given situation. Fiedler has developed a means of characterizing situations based on their degree of favorableness by dichotomizing groups on each of these three dimensions (usually accomplished

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in a given study by a median split of all groups measured by that study's specific operationalizations of the dimensions) and then forming the eight possible configurations of situational factors resulting from these dichotomies. These situational types are labeled Octants I-VIII. These octants can be geometrically represented by considering each situational dimension as one dimension of a cube. Dividing the three dimensions at their respective mid-points results in eight small cubes corresponding to the eight octants. Each octant can then be characterized as high or low on each dimension and each small cube can be appropriately labeled.

The remaining problem in comparing the situations or octants becomes one of ordering the octants according to their respective degree of favorableness. Obviously, the octants labeled as high or low on all three dimensions mark the extreme end-points of the ordering, but the other six octants are not so easily dealt with. Fiedler has developed a logical, rather than an empirical, argument to solve this ordering problem. He contends (1967) that the most salient factor for determining favorableness is leader-member relations. Any situation high on this dimension is more favorable than situations low on this dimension. If two groups are equally favorable on the relations dimension, a group with a structured task has a more favorable situation than a group with an unstructured task. Finally, the least important factor in determining situation favorableness, according to Fiedler, is the leader's position power. In ordering the favorableness of two situations, differences on the position power dimension would only be considered if the situations were equally favorable on both of the two other dimensions. A simplification of this ordering procedure that is typically reported in studies on Fiedler's model is presented in Table 1. Note that Octant 1

identifies the most favorable situation and Octant VIII identifies the least favorable situation.

With this ordering of situations, Fiedler was able to order situation favorableness on a continuum from low to high. By correlating leadership style and group effectiveness, and plotting these values against the situation favorableness dimension, he was able to obtain a graphic representation of the relationships among these variables. In developing this graph, Fiedler put situation favorableness on the abscissa of a standard coordinate system and the correlation values -1.00 to +1.00 on the ordinate. Plotting the results of several studies relating LPC to group effectiveness during the period from about 1952 to 1964 resulted in an inverted U-shaped graph. This graph gave rise to Fiedler's contingency notions. Negative relationships between LPC and effectiveness characterized situations on the extreme ends of the favorableness continuum. Alternately, positive relationships were found between these two variables for situations of moderate favorableness. From this finding, Fiedler concluded that group effectiveness is a function of both leadership style and situation favorableness factors.

Before closing this discussion of Fiedler's model, a final note should be considered. This point concerns the stability of LPC within an individual. Fiedler argues that because a leadership style can result in different behaviors in different situations, it is reasonable to expect LPC to be stable over time. He presents data to support this contention (1974). Conceding minor fluctuations, he argues that LPC may change over time but such changes are likely to be slight. Task- or relations-orientations are fairly stable leadership traits. Such a position has definite bearing on the trait x situation interaction issue

TABLE 1. Fiedler's Ordering of Situation Favorableness

Octant	Leader-Member Relations	Structure	Position Power
I	Good	Structured	Strong
II	Good	Structured	Weak
III	Good	Unstructured	Strong
IV	Good	Unstructured	Weak
V	Moderate Poor	Structured	Strong
VI	Moderate Poor	Structured	Weak
VII	Moderate Poor	Unstructured	Strong
VIII*	Moderate Poor	Unstructured	Weak

Note: In recent discussions, Fiedler has added a ninth situation type in which leader-member relations are very poor. It is labeled VIIIa. Its absence from the present discussion in no way affects the ultimate conclusions.

in question here. It also has ramifications for other areas of interest such as leadership development. These implications will be referred to again at a later point. Let us now proceed to another conceptualization of the trait x situation interaction issue in the study of leadership.

While the specific name "Contingency Model" has been applied to Fiedler's notions, the term "contingency approach" is also used in a general sense to refer to any trait x situation interaction view of leadership. There are at least two other such contingency approaches to leadership besides Fiedler's. One of these has been developed by House and various colleagues (1971, 1974a and 1974b). The other is presented by Vroom and Yetton (1973). Although the House notions of a path-goal approach to contingency issues are generating some interest, that interest does not appear as widespread as that surrounding the Vroom and Yetton model. Also, the Vroom and Yetton model is in more direct opposition to the Fiedler model than are House's notions. For these two reasons, the present discussion will only fully develop the Vroom and Yetton model. This development follows.

To consider Vroom and Yetton's (1973) contingency notions, we must alter our perspective and begin to look at leadership from a different frame of reference. The Vroom and Yetton concepts have not been the subject of the same plethora of studies that have surrounded Fiedler's theorizing. Of course, this is partly due to the short life of Vroom and Yetton's ideas. However, the model's development has been characterized by a history of research that makes it something more than just an intuitive hunch about leadership. It is because of this empirical base that the model is considered worthy of further examination.

The title of Vroom and Yetton's model, "A Model of Leadership and Decision Making," indicates a concern with leadership and its relationship to the decision making process. Vroom and Yetton say their model is the result of their interest "in the way in which leadership is reflected in the social processes utilized for decision making, specifically in leaders' choices about how much and in what way to involve their subordinates in decision making" (1973, p. 5). Notice that decision making is referred to in two contexts. One of these is the decision making process of the leader concerning the issue of how much authority to share. The second is the decision making process of the group required to achieve its end. The model is posited to facilitate the first kind of decision making which in turn impacts the effectiveness of the second kind of decision making.

Unlike Fiedler's model which can be stated in a few short sentences, the Vroom and Yetton model consists of a series of assumptions, definitions and rules. It is a normative model designed to provide a rational way of deciding the appropriate form and amount of participation to allow subordinates in decision making situations. In developing this system Vroom and Yetton note their agreement "with the basic tenent of contingency theories that 'leadership must depend upon the situation' . . ." (Vroom, 1974, p. 49).

To consider a normative model requires that there be some ultimate criteria against which a given decision's appropriateness is judged. In Vroom and Yetton's approach the general criterion is the ultimate effectiveness of the final group decision, no matter how it is made. Conceptually, this is presented as three subcriteria: 1) the quality or rationality of the decision; 2) the acceptance of commitment on the part

of subordinates to execute the decision effectively; and 3) the amount of time required to make the decision (Vroom, 1974).

Given these criteria, Vroom and Yetton first make some assumptions concerning the correct way of achieving acceptable levels of output on these measures. They enumerate several such assumptions in their original presentation of the model (1973). Where appropriate they also cite research which supports these assumptions. These assumptions are:

> 1) Generally, the normative model should be . . . of potential value to . . . leaders in determining which leadership methods they should use in . . . the situations they encounter. Consequently . . . the behavior required of the leader should be specified unambiguously.
>
> 2) There are a number of . . . social processes by which organizational problems can be translated into solutions . . . (which) vary in terms of the amount of potential participation by subordinates . . .

In conjunction with this second assumption, Vroom and Yetton provide a taxonomy of decision making styles that are differentiated on the basis of the amount of participation allowed subordinates. The taxonomy uses the following symbolism: AI--the manager solves the problem alone; AII--the manager obtains necessary information from the subordinates and solves the problem alone; CI--the manager shares the problem individually with relevant subordinates, gets their ideas and then solves the problem alone (the manager may or may not use the subordinates' ideas); CII--the manager shares the problem with the subordinates as a group but solves the problem as in CI; GII--the manager shares the problem with the group and they cooperatively generate and evaluate solutions and a decision is based on agreement (consensus). These styles are used when interaction with a group is required. Vroom and Yetton also define two additional styles (symbolized GI and DI) which may be employed when a leader faces a problem involving only one subordinate. Since the major purpose of this

discussion is to develop the Vroom and Yetton model as a basis for comparison with Fiedler's model, these styles are not particularly germane given Fiedler's focus on groups. Continuing on, then, with the other assumptions, we find:

> 3) No one leadership method is applicable to all situations . . . a normative model should . . . provide a framework . . . for the analysis of situational requirements . . .
>
> 4) The most appropriate unit (of) analysis of the situation is the particular problem and (its) context.
>
> 5) The leadership method used in . . . one situation should not constrain the method . . . used in other situations.

After identifying their assumptions, Vroom and Yetton provide conceptual bases as the means of meeting the three criteria. The basic considerations in achieving these criteria are:

> 1) The importance of the quality of the decision.
>
> 2) The extent to which the leader possesses sufficient information/ expertise to make a high quality decision by himself.
>
> 3) The extent to which subordinates, taken collectively, have the necessary information to generate a high quality decision.
>
> 4) The extent to which the problem is structured.
>
> 5) The extent to which acceptance or commitment on the part of subordinates is critical to the effective implementation of the decision.
>
> 6) The prior probability that the leader's autocratic decision will receive acceptance by subordinates.
>
> 7) The extent to which subordinates are motivated to attain the organizational goals as represented in the objectives explicit in the statement of the problem.
>
> 8) The extent to which subordinates are likely to be in disagreement over preferred solutions.

(Note that in a more recent version of the model (Vroom, 1974) statement #3 is dropped. This does not affect the present discussion.) These bases, when stated in question form actually serve as a series of tests by which the leader assesses the constraints of a situation. The leader

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can respond to each question with either a yes or no. After all the questions have been answered for a given situation, the manager is left with a set of constraints which guide his/her choice of the appropriate decision making style. These constraints, when considered in conjunction with a series of seven rules (three of which are designed to protect decision quality and four of which are designed to assure acceptance of the decision) yield a "feasible set" of decision making behaviors. From this set, the decision nearest to AI (when listed in the order given above) is chosen to assure minimization of manhours required. The seven rules, which constitute the normative model are:

1) Information Rule--If the quality of the decision is important and the leader does not possess enough information, AI is eliminated from the feasible set.

2) Goal Congruence Rule--If quality is important and subordinates do not share organizational goals, GII is eliminated from the feasible set.

3) Unstructured Problem Rule--If quality is important, the leader lacks the necessary information, and if the problem is unstructured, AI, AII, and CI are eliminated from the feasible set.

4) Acceptance Rule--If acceptance of the decision by subordinates is critical and if it is not certain and autocratic decision made by the leader would receive acceptance, AI and AII are eliminated from the feasible set.

5) Conflict Rule--If acceptance is critical, if an autocratic decision is not certain to be accepted, and if subordinates are likely to be in conflict, AI, AII and CI are eliminated from the feasible set (because they allow no opportunity to resolve conflict).

6) Fairness Rule--If quality is unimportant, acceptance is critical and not certain to result from an autocratic decision, AI, AII, CI, and CII are eliminated from the feasible set.

7) The Acceptance Priority Rule--If acceptance is critical and not assured by an autocratic decision, and if subordinates can be trusted, AI, AII, CI, and CII are eliminated from the feasible set.

Before comparing and contrasting the Fiedler and Vroom and Yetton models as the major factors in the trait x situation interaction argument in the leadership area, an additional note should be made regarding the Vroom and Yetton model. This consideration points up a major difference between Fiedler and Vroom and Yetton with regard to the issue at hand.

Vroom and Yetton have used the concepts in their normative model to develop a descriptive model of leader behavior. This was accomplished in the following manner. They first developed a ratio scale for measuring a leader's degree of participativeness. The styles in their taxonomy were assigned values along this scale. Such a scale allows the assignment of a numerical value to a leader's degree of participativeness and this value is amenable to statistical evaluation. Measures of central tendency, dispersion, and tests of hypotheses thus become meaningful.

Given this metric of participation, they had leaders either 1) describe situations they had been involved in and then report the decision making styles they used in each; or 2) respond to a series of hypothetical situations in which the situational factors discussed above were experimentally manipulated. It is the latter approach that Vroom and Yetton discuss most fully. Results from this latter technique indicate that managers tend to use more than one style of decision making across situations. They also found that changes in situational factors accounted for a large portion of the variance in the measure of participation used, and that differences between managers only accounted for about 10 percent of the variance in the dependent measure. From these results, Vroom and Yetton conclude that it may be more appropriate to speak of participative and autocratic leadership situations rather than participative and autocratic leadership styles. Other interesting findings that came from this descriptive research were: 1) That managers typically demonstrated

less variance in their choice of styles across situations than the normative model would predict, and 2) Managers selected the decision making style the normative model prescribed in only about 40% of all situations. These two findings imply that Vroom and Yetton's normative model may still be inadequate as a mechanism for describing managers' self-reports of their behavior.

Problems Surrounding Contemporary Contingency Views of Leadership

Up until now, this discussion has been historical and/or descriptive. However, if we consider what has been reported, at least two issues arise which appear problematic. First, the study of leadership is presently being influenced by interactionist viewpoints (e.g., Weed, Jackson, & Moffitt, 1976). Successful leader behavior is being considered a function of some interaction between an individual's leadership style and the situation in which the leader behavior is enacted. The acceptance of such an interactionist perspective becomes problematic when one remembers Golding's remarks concerning the appropriateness of the data necessary to support such positions.

The second issue is the presence of several contingency theories regarding leader behavior. As yet there is no single explanation of the style x situation interaction that is uniquely acceptable. Because these competing theories exist, contingency approaches are in need of comparative evaluation which would result in a more univocal explanation of these interactive relationships. There is a need for a more singular explanation of contingency relationships if such relationships do, in fact, exist.

To appreciate the problematic nature of these issues more fully, let us reiterate Golding's comments noted earlier. He identified two difficulties in the resolution of the trait vs. situationism controversy

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in personality research which appear equally applicable to this discussion of contingency views of leadership. The first problem to be recalled is his response to the Bowers vs. Mischel controversy over the appropriateness of an interactionist perspective in personality research. He accurately pointed out that finding a significant interaction in the results of any research effort is not unequivocal proof that the interaction is meaningful. Similarly, he notes that such significant interactions cannot be summarily dismissed as idiosyncratic and unworthy of study. He pointed to the literature on statistical artifacts in the size of interaction terms as well as the problem of confounded error in some interactions as sufficient reasons for careful consideration of any interaction. He concludes, and we must concur given his argument, that the controversy over the appropriateness of an interactionist perspective will only be resolved when careful data analysis demonstrates the presence or absence of homogeneous subclusters of persons who behave similarly across several situations.

While contingency views of leadership are considered appropriate, none are based on such an empirical demonstration of subclusters of similarly-behaving people. Such theories seem premature in the absence of these data. In essence, an interactionist perspective is influencing thinking about leadership before that perspective has been empirically evaluated. Before one can compare competing contingency theories, careful scrutiny must be given to the issue of whether such interactions are meaningful. Such a study must be the primary research concern of investigators interested in the area of leadership because of the influence contingency approaches already have and because it is the sine qua non of all contingency research. If the interactions are not meaningful, other research on contingency views seem pointless. Such basic research

should also illuminate the Fiedler vs. Graen, et al. controversy noted above by providing more definitive evidence regarding the appropriateness of a contingency model.

If, and only if, the appropriateness of an interactionist perspective can be demonstrated, research can go on to consider the second problematic issue noted above and attempt comparisons of competing contingency theories. Such comparisons may be limited by the fact that in many ways the various theories address contingency issues from incomparable perspectives. But, even though these theories focus on different aspects of the leader-follower(s) relationship, certain basic assumptions underlying the various models seem to be in direct competition and thus become worthy of research. Such is the case with the Fiedler and Vroom and Yetton models. There is a basic difference between these two approaches that strikes at the heart of the contingency issue and thus has general implications for any final singular approach to contingency theories. This difference in the two models is subject to Golding's second criticism referred to above in that it involves the trait vs. situation emphasis of the two theories.

As stated earlier, leadership research is not currently marked by pure trait- or situation-oriented approaches like those in personality research. There is, however, a tendency toward strong trait- or situation-oriented contingency views. Consider the following. Fiedler arrives at the conclusion that a) LPC is related to the need-satisfaction structure of the individual leader, and b) LPC is stable over time. An extension of these conclusions results in a stronger reliance on traits in explaining the leader-situation interaction than on situation factors. Fiedler presents what can be called a "strong trait" view of contingency theory. Since LPC is less changeable than are situations,

the key to understanding leadership effectiveness lies first in understanding a trait of the leader. Alternately, on the basis of their research on the descriptive aspects of their model, Vroom and Yetton conclude that situational factors are the stronger of the two in accounting for variance in their measures of leader behavior. Since changes in situational factors accounted for a large portion of behavior variance while differences between managers only accounted for 10 percent of the variance, they consider traits of much less importance than situational factors. We can call their approach a "strong situational" view of the trait x situation interaction in leader behavior. Given this difference in perspective, some resolution seems necessary. Are traits or situations more effective in the interaction? The answer to this question has direct bearing on the development of a more singular course for future contingency research.

The following portions of this paper develop a methodology aimed at addressing these two problematic issues confronting contingency theories of leadership. The information generated by this research should provide a broader base from which contingency theories and leadership research can advance. The methodology to be developed is based on Golding's suggestions concerning the appropriate way to address such issues.

A Solution to Problems Surrounding Contingency Theories

Golding's Suggestions. It has been shown in the foregoing discussion that the advocacy of contingency theories of leadership may not have as strong an empirical base as is necessary to resolve the issue of whether such interactionist perspectives on leadership are meaningful. A primary research question centers, then, on identifying such a base. If this foundation cannot be shown to exist, research should pursue some other

means of explaining successful leader behavior besides contingency approaches. If the base can be developed, comparative research on various contingency theories can begin.

As noted earlier, Golding has suggested some general methods which seem appropriate in addressing the trait x situation interaction issue in personality research. It is argued here that these methods may be meaningfully generalized to the present area of interest. They are capable of identifying homogeneous subclusters of similarly behaving individuals in similar types of situations. The demonstration of these clusters if the primary concern in resolving the issue of the appropriateness of interactionist positions, thus, these clusterings become key concerns in research on contingency theories.

To assure the appropriateness of these methods in the present context, let us reconsider the basic hypothesis of contingency theories. Generically, contingency theories explain effective leadership based on an interaction between leadership behaviors, styles, or traits and the situation in which the behavior is enacted. A simple, but general, graphic illustration of this notion is depicted in Figure 1. The diagram indicates that if one studied the behavior of effective leaders in various types of situations, certain patterned relationships should emerge. From this figure, leader behaviors characteristic of Style 1 should predominate in situations classified as Type 2. Similarly, Style 2 behaviors should predominate in situations labeled Type 1. The basic hypothesis is that effective leaders in one situation will employ a different class of behaviors in that situation than will effective leaders in another type of situation. For Fiedler, the two groups of effective leaders will probably not contain the same people while for other contingency theorists they may be the same individuals. In either

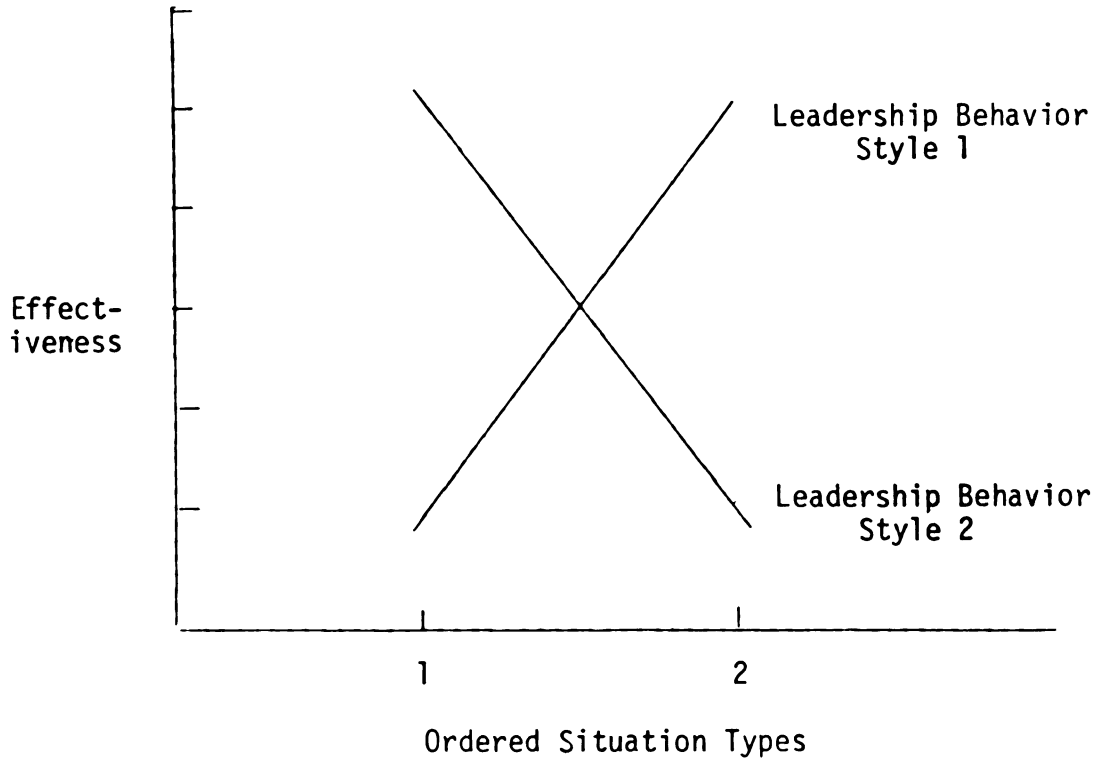

Figure 1. A general graphical description of contingency theories.

case, the generic hypothesis is that within a group of acting, effective managers, behaviors will cluster in relation to clusters of situations. As in the case of Golding's arguments concerning personality research, basic support of the generic contingency hypothesis is obtained with the identification of clusters of situations characterized by certain types of behaviors or vice versa, clusters of behaviors which are primarily emitted in certain types of situations. This requirement implies some type of clustering procedure as the analysis of choice for supporting or rejecting contingency notions about leadership and makes Golding's recommendations regarding analysis techniques particularly germane to the present discussion.

Golding suggests that multivariate clustering techniques are well suited to the task of identifying such meaningful patterns or relationships. He notes that several techniques of this type have been proposed (e.g., Fleiss & Zubin, 1969; Tucker, 1964; Wiggins, 1973), but that they have not been widely used. He contends, as we have similarly seen in the leadership area, that few empirical attempts have been made at interpreting those interactions that are used as the basis of interactionist positions. In response to this deficiency, he calls for research to "search for person subclusters that are relatively homogeneous with respect to either the pattern of response in a particular situation or a pattern of responses across situations" (p. 285). This call for research on person subclusters actually implies the analysis of a three-way interaction (persons x situations x behavioral response pattern) rather than a two-way interaction (situations x behavioral response pattern) as stated in the generic contingency hypothesis. But, it seems clear that individual differences are assumed to exist among leaders, thus eliminating any difficulty in applying Golding's comments to the present problem. Such three-way interactions are illustrated by Fiedler's use of LPC as an individual differences variable and by the other contingency approaches' concerns with effective versus ineffective leaders.

Given that we must explore a three-way interaction to determine whether contingency theories are appropriate normative or descriptive models for leadership research to follow, what research course should we pursue? Let us consider one of the few methods in Golding's list that has actually been used in research settings. It is called "Three-Mode Factor Analysis" and much of the theoretical work involved in

developing the technique is credited to Ledyard Tucker of the University of Illinois.

Three-Mode Factor Analysis. Some types of multivariate clustering techniques are not new to the field of psychology. Most basic statistic texts in psychology reference the early work of Pearson (1901), Spearman (1904), and Thurstone (1931) in the area of factor analysis, one such technique. However, most of these discussions focus on the analysis of two-dimensional data. They typically explore the relationships found in a two-dimensional data matrix such as that formed when subjects' responses to a set of test items are put in matrix form with a row for each subject and a column for each item. Traditional factor or cluster analysis techniques are then used to determine a small number of item factors (a factor is a linear combination of the variables under study) which explain the variance in the items or a number of person factors that explain the variance in persons. But, such analyses are incapable of empirically exploring the relations among three dimensions as posed by the present discussion. Previously, when factor analysts have confronted such a three-dimensional problem, they have often chosen to collapse the data over one of the dimensions (e.g., sum over the subjects) and then they have proceeded with a standard two-dimensional factor analysis. Such piece-meal analyses will not resolve the present problem. Rather, a simultaneous, three dimensional analysis is necessary. Only in recent years have possible solutions to this problem been developed; three-mode factor analysis is one such solution. It provides a means of simultaneously analyzing three dimensions as well as a vehicle for considering the relations between the factor structures of those dimensions.

In 1964 Tucker presented the theoretical extension of two-dimensional factor analysis to the three-dimensional case. Later, he presented an intensive clarification of the mathematics involved in three-mode factor analysis (Tucker, 1966a). During the same period research began to emerge which developed the notions of three-mode analysis more pragmatically (Hoffman, 1964; Levin, 1965; and Tucker, 1966b). The discussion of this technique presented below is based on these efforts, especially those of Tucker (1966a) and Levin. We will look first at Levin's verbal extension of two-mode analysis to the three-mode case, and then go on to Tucker's more careful mathematical arguments regarding three-mode analysis.

Levin's (1965) explanation of three-mode factor analysis begins with a modification of the two-mode case which serves as the basis for his generalizations to the three-mode situation. This modification follows.

Assume that semantic differential data are collapsed over a series of subjects so we are left with a two-way (scales (i) by concepts (k)) classification of that data. The data are organized in a matrix, X, of order i x k and of rank p ($p \leq i$, $p \leq k$). Assume also that these data have been standardized so sums of products can be used rather than correlations. Then, application of the Eckart-Young procedure (1936) results in a factoring of ${}_iX_k$ into three matrices:

$$ {}_iX_k = {}_iU_i\Lambda_kV_k, $$

where U = the orthonormal latent vector matrix of XX^T

V = the orthonormal latent vector matrix of X^TX

Λ = a rectangular matrix with 0 entires off diagonally, p nonzero entries ($\lambda_1 . . . \lambda_p$) in the diagonal starting with the upper left corner, with λ_j^2 (j = 1 . . .p) being the latent roots of XX^T (or of X^TX). Assume that the λ_j are arranged in decreasing order of magnitude.

If some reduced number (m) of values of Λ is chosen rather than p, a least squares approximation to X from m factors results, causing the factored equation to take on a different form:

$$\ddot{X} = {}_{i}U_{m}\Lambda_{m}V_{k}$$

where $\ddot{X}$ is the approximated X.

Then, changing U and V to principal-axes factor loading matrices yields:

$$X = (U\Lambda)\,\Lambda^{-1}(\Lambda V)$$
$$= \bar{U}\Lambda^{-1}\bar{V}$$

where $\bar{U}$ and $\bar{V}$ are the factor loading matrices of scales and concepts, respectively. Similarly, rotating $\bar{U}$ and $\bar{V}$ to simple structure to aid interpretation results in the equation:

$$\ddot{X} = (\bar{U}T)\;T^{-1}\;\Lambda^{-1}\;P^{-1}\;\;(P\bar{V})$$

if $\bar{U}$ is rotated by T and $\bar{V}$ by P. Finally, defining three matrices as follows:

$$A = (\bar{U}T),\; B = (P\bar{V}),\; G = (T^{-1}\;\Lambda^{-1}\;P^{-1})$$

we arrive at a solution of the form:

$$\ddot{X} = A\;G\;B$$

Note that the solution is a product of three matrices rather than two as is usually the case in traditional two-dimensional factor analysis. As Levin notes,

> This seems to be a loss of parsimony, but this loss is compensated by a gain: both scales and concepts are treated symmetrically. We have a factor loading matrix for scales and a factor loading matrix for concepts. And (sic) both have been transformed to some especially meaningful form such as simple structure (p. 443).

In this modified solution we can see that A and B are analogous to factor loading matrices while G takes on a role similar to that of a

factor score matrix. But notice that G is reduced with respect to both rows and columns due to its dependence on the factoring of scales and concepts. As such, it depicts the factor scores of the concept factors on the scale factors. Thus, it acts as an inner core matrix, describing the relations between the two factor structures rather than providing raw factor scores. Finally, to the extent that all p factors are retained throughout the process, the pre- and post-multiplication of G by A and B yields scores for the scales and concepts which reproduce the original data as a function of "idealized" scales and "idealized" concepts which result from the factor analysis. If nonsignificant factors are dropped during the analysis (i.e., reduce p to m), the final products of these idealized constructs are only estimates of the original scale and concept scores.

Given these notions of an inner core matrix and the ability to reproduce the data based on the multiplication of idealized constructs and this core, Levin is ready to generalize these ideas to the three-dimensional case. Because of the modifications of two-dimensional analysis discussed above, this extension is rather straightforward. In the three-dimensional case, we want to reproduce the original data based on the following factored equation:

$$X_{ijk} = \sum_{mpq}\sum\sum a_{im}\, b_{jp}\, c_{kq}\, g_{mpq}$$

Using data classified according to three dimensions, these data are reduced to an inner core G_{mpq}, which retains a three way classification, and three factor weight matrices ${}_iA_m$, ${}_jB_p$, ${}_kC_q$. These four matrices' roles are analogous to those of the core and factor weight matrices in the previous two-dimensional analysis, making the reproduction of the original data (or estimates thereof) the same simple matter of pre-

and post-multiplication of the factor score matrix, G, by the three factor weight matrices.

From these comments, the generalization from two-dimensional factor analysis becomes clear. Consider the semantic differential data referred to earlier in this discussion. By retaining individual subjects' data, rather than collapsing across those subjects to obtain the scales x concept matrix used earlier, we now have data that is classified three ways: subjects, scales, and concepts. Employing the techniques of three-mode factor analysis, we can develop an inner core matrix classified three ways and three weight matrices (one each for subjects, scales, and concepts). As in the two-dimensional case, the inner core defines the relations between the three sets of factors. Then, if we consider idealized subjects, scales, and concepts, we are again able to reproduce the subjects' original data based on these constructs through the multiplication of G by A, B and C. In this case the core provides a given concept factor's score on a given scale factor for a given individual or subject factor. Thus, we have a means of assessing the clustering of concept measures on clusters of scale measures for clusters of subjects. This is precisely the end Golding has argued is necessary to demonstrate the meaningfulness of an interactionist perspective. Therefore the analysis seems appropriate for the present problem. We will continue to explore it in more detail. Of course, generalizing the model to the contingency area demands modifications in the input dimensions. In such a case these dimensions would be subjects, situations and behavioral responses. Then, the inner core would indicate behavioral response clusters for the situation clusters within clusters of subjects. Thus, at a verbal level, three-mode factor analysis provides a way of examining the meaningfulness of

contingency theories. Let us now move on to Tucker's (1966a) discussion of the mathematics involved in this type of analysis.

In developing his mathematical concepts of three-mode factor analysis, Tucker employs some changes from standard mathematical notation that he developed to make his description more comprehensible. Since the present remarks on this technique will follow Tucker's, a few comments on these notational idiosyncracies are appropriate.

The first change involves terminology. As can be detected from the foregoing discussion, "dimension" is used in traditional factor analysis in different ways. This tends to muddy its meaning. Tucker has tried to avoid this by employing the term "mode." In standard factor analyses, the term dimension is first used to refer to the aspects of a given raw data matrix. It is the term for the classifications of the data. In our original discussions of two-dimensional factor analysis, we considered people and items or scales and concepts as the dimensions of a particular analysis in accord with this standard practice. However, the results of ordinary factor analyses have also been called dimensions. That is, the word is also applied to the factors that result from the analysis which explain the variance in the input dimension of interest. To avoid this confounded usage, Tucker labels the original aspects of the raw data matrix "modes" rather than dimensions. Specifically, he defines a mode as "a set of indices by which data might be classified" (1964, p. 112). Considering the contingency problem at hand as an example, the modes of this three-dimensional data matrix would be persons, situations, and behavioral responses.

As in two-mode analyses, these modes are denoted by subscripts on a given data element to identify which modes the element relates to. Rather than having a data point subscripted by two indices (e.g., x_{ij})

as in two-mode analyses, three-mode analysis uses a triple subscript. The general data element becomes (x_{ijk}) where i refers to the individual mode, j references the situation mode and k indexes the behavior response mode. Similarly, in this context, N_i is the symbol for the total number of subjects, N_j references the total number of situations, and N_k is the total number of behavioral responses under study.

To simplify the conceptualization of three-mode data matrices, Tucker also modifies standard matrix notation in two ways. The matrix X, of elements x_{ijk}, would normally be considered to have i rows, j columns, and k parallelpipeds or vertical sections parallel to each other beginning with the frontal plane of the three-dimensional matrix which is defined by the first set of i rows and j columns. In Tucker's modified notation this matrix would be identified by ${}_iX_{(jk)}$, where the index for the rows of the matrix is to the left of the matrix symbol, rather than being the first symbol of three to the right of the X.

The second change in notation is the enclosure of j and k in parentheses. This symbolism denotes what Tucker terms a combination mode. Rather than have k-1 planes parallel to the frontal plane of a three-dimensional data cube, these parallelpipeds are considered to be continuations of the rows of the frontal plane. That is, the k-1 sections of the three-mode matrix are respectively added as additional columns to the rows formed in the frontal plane. This results in a two dimensional matrix of i rows x (j x k) columns. At this point, Table 2 may be helpful in aiding the reader's understanding of Tucker's matrix notation. Table 2 is a raw data matrix of the form ${}_iX_{(jk)}$ in which j and k unite to form the combination mode. Note that this combination mode is simply a Cartesian product of the two elementary modes. In Tucker's notation, the "outer-loop" of this combination is designated by the first

TABLE 2. Raw Data Matrix ${}_iX_{(jk)}$

	1_j				2_j				3_j				4_j			
	1_k	2_k	3_k	4_k	1_k	2_k	3_k	4_k	1_k	2_k	3_k	4_k	1_k	2_k	3_k	4_k
	$1_{(jk)}$	$2_{(jk)}$	$3_{(jk)}$	$4_{(jk)}$	$5_{(jk)}$	$6_{(jk)}$	$7_{(jk)}$	$8_{(jk)}$	$9_{(jk)}$	$10_{(jk)}$	$11_{(jk)}$	$12_{(jk)}$	$13_{(jk)}$	$14_{(jk)}$	$15_{(jk)}$	$16_{(jk)}$
1_i	x_{111}	x_{112}	x_{113}	x_{114}	...											
2_i	x_{211}	x_{212}	x_{213}	x_{214}	...											
3_i		.														
4_i		.														
5_i		.														
6_i																
7_i																
8_i																
9_i																
10_i																
11_i																
12_i																
13_i																
14_i																
15_i																
16_i																
17_i																

TABLE 2 (cont'd.).

	1_j				2_j				3_j				4_j			
	1_k	2_k	3_k	4_k	1_k	2_k	3_k	4_k	1_k	2_k	3_k	4_k	1_k	2_k	3_k	4_k
	$1_{(jk)}$	$2_{(jk)}$	$3_{(jk)}$	$4_{(jk)}$	$5_{(jk)}$	$6_{(jk)}$	$7_{(jk)}$	$8_{(jk)}$	$9_{(jk)}$	$10_{(jk)}$	$11_{(jk)}$	$12_{(jk)}$	$13_{(jk)}$	$14_{(jk)}$	$15_{(jk)}$	$16_{(jk)}$
18_i																
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30_i																

subscript within the parentheses, while the "inner-loop" is denoted by the second subscript.

Before leaving these comments on matrix notation, at least two advantages of these devices should be noted. The first is the ease with which the transpose of a matrix can now be identified. Since ${}_{i}X_{(jk)}$ is a matrix of order i x (j x k), its transpose simply becomes ${}_{(jk)}X_{i}$. This notational convenience facilitates extended matrix multiplication equations since multiplied matrices must be conformable with regard to their subscripts. Thus, the appropriateness of regular or transpose multiplication can be quickly verified.

The second advantage of Tucker's notation is somewhat of a corollary to the first. It is the ease of matrix identification that Tucker's notation allows. There are 12 possible combinations by which a three-mode matrix can be identified. We realize this when we consider that any one of the three modes can be used as the single mode with the other two operating in the combination mode. This gives three possible combinations immediately. Then, when it is seen that either of the two elements in these three combination modes can constitute the outer loop, the number of possible combinations increases to six. Finally, if one allows the combination modes to identify rows in the matrix as well as columns, the total number of possible combinations again doubles to reach 12. With Tucker's notation there is less chance of misidentifying a matrix which has only been described in notational terms. The combination mode and row and column characteristics are clearly indicated by his symbolism.

The final matrix algebra device which Tucker employs that demands comment is the operation called the Kronecker or direct product of two matrices. This technique's infrequent use in other areas, rather than

any variance in Tucker's employment of it, is the basis for this comment. Tucker uses the method in its standard form. Basically, a Kronecker product is a supermatrix made up of several submatrices. These submatrices are each formed when an element of one of the two matrices entering the Kronecker operation is multiplied by every element in the second matrix. These several individual products form the submatrices which are incorporated into the final super-matrix. For example, consider the square matrices A and B of orders m and n respectively. To find their Kronecker product, denoted here $A \underline{X} B$, we develop m^2 square submatrices each of order n by multiplying each of the a_{ij} elements by every one of the elements in B. Simply, a_{11} is multiplied by each single element of B and a submatrix is formed containing each of these n^2 products. This submatrix is the first element in the super-matrix $A \underline{X} B$. The process is then iterated until there are m^2 submatrices, each formed by the multiplication of an element of A with all of the elements of B. The ordered combination of these submatrices is the Kronecker product of A and B.

With these basic matrix concepts as a background, let us go on to consider Tucker's description of the actual operations of three-mode analysis. In this discussion the reader can assume that all matrix operations follow standard form unless otherwise noted in the previous discussion. Assume also that the data referred to are amenable to a consideration of contingency models of leadership. That is, the modes of the analyses will be subjects, situations and behavioral responses and the observed data are originally contained in ${}_{i}X_{(jk)}$ where i indexes subjects, j indexes situations, and k indexes behavioral responses.

As Tucker notes, the fitting of the model produced by this analysis to the observed x_{ijk}'s will always involve some discrepancies, so before

starting we will assume

$$x_{ijk} = \hat{x}_{ijk} + e_{ijk}$$

where $\hat{x}_{ijk}$ is the value obtained from the final model. However, since the analysis is a factoral one, we must also assume that each $\hat{x}_{ijk}$ is made up of a major component attributable to some general factor and of lesser unique factor components. Therefore, to the extent that these lesser factors are dropped from the analysis, $\hat{x}_{ijk}$ becomes $\tilde{x}_{ijk}$. This $\tilde{x}_{ijk}$ value is the one which the model will actually reproduce. With this value, we can recall Levin's statement of the basic equation of three-mode factor analysis and go on to consider Tucker's comments concerning how the analysis works.

Remember that the basic equation is of the form

$$\tilde{x}_{ijk} = {}_m {}_p {}_q \; a_{im} \, b_{jp} \, c_{kq} \, g_{mpq}$$

Remember also that m, p, and q are derived modes corresponding to i, j, and k which come from reducing the appropriate matrices to their factor structure. These derived modes are the idealized subjects, situations and behavioral responses. Note, however, that this basic equation can be rewritten as

$$\tilde{x} = \sum_m a_{im} \sum_p \sum_q g_{mpq} \, (b_{jp} \, c_{kq})$$

in which case the product $(b_{jp} \, c_{kq})$ is actually one element of a Kronecker product $({}_pB_j \underline{X} \, {}_qC_k)$. Thus, generalizing to the matrix level, we can accomplish the double summation over p and q noted in the general equation above by simply doing some matrix manipulations involving multiplication and Kronecker products. Thus, the entire matrix ${}_i\tilde{X}_{(jk)}$ can be reproduced by

$${}_i\tilde{X}_{(jk)} = {}_iA_m \, G_{(pq)} \, ({}_pB_j \underline{X} \, {}_qC_k).$$

Similarly, we might consider the factor structure of situations or behavioral responses and modify X to obtain either

$$ {}_j\tilde{X}_{(ik)} = {}_jB_p\, G_{(mq)}\, ({}_mA_i \underline{X} {}_qC_k), $$

or

$$ {}_k\tilde{X}_{(ij)} = {}_kC_q\, G_{(mp)}\, ({}_mA_i \underline{X} {}_pB_j). $$

Now, Tucker notes that if we define the following product matrices

$$ {}_i\tilde{M}_i = {}_i\tilde{X}_{(jk)}\, \tilde{X}_i, $$

$$ {}_j\tilde{P}_j = {}_j\tilde{X}_{(ik)}\, \tilde{X}_j, $$

and

$$ {}_k\tilde{Q}_k = {}_k\tilde{X}_{(ij)}\, \tilde{X}_k, $$

and substitute the above equalities in these definitions, an interesting set of relationships emerge. Consider

$$ {}_i\tilde{M}_i = {}_iA_m\, G_{(pq)}\, ({}_pB_j \underline{X} {}_qC_k)\, ({}_jB_p \underline{X} {}_kC_q)\, {}_{(pq)}G_m\, A_i, $$

$$ {}_j\tilde{P}_j = {}_jB_p\, G_{(mq)}\, ({}_mA_i \underline{X} {}_qC_k)\, ({}_iA_m \underline{X} {}_kC_q)\, {}_{(mq)}G_p\, B_j, $$

and

$$ {}_k\tilde{Q}_k = {}_kC_q\, G_{(mp)}\, ({}_mA_i \underline{X} {}_pB_j)\, ({}_iA_m \underline{X} {}_jB_p)\, {}_{(mp)}G_q\, C_k. $$

(The Kroneckers in these equations are ordered by the rule that the transpose of a Kronecker product matrix equals the Kronecker product of the transposes of the original matrices in the same order as in the original product.) If we let

$$ {}_mM_m = {}_mG_{(pq)}\, ({}_pB_j \underline{X} {}_qC_k)\, ({}_jB_p \underline{X} {}_kC_q)\, {}_{(pq)}G_m, $$

$$ {}_pP_p = {}_pG_{(mq)}\, ({}_mA_i \underline{X} {}_qC_k)\, ({}_iA_m \underline{X} {}_kC_q)\, {}_{(mq)}G_p, $$

and

$$ {}_qQ_q = {}_qG_{(mp)}\, ({}_mA_i \underline{X} {}_pB_j)\, ({}_iA_m \underline{X} {}_jB_p)\, {}_{(mp)}G_q. $$

we arrive at

$$\tilde{M}_i = {}_iA_m \; M_m \; A_i$$

$$\tilde{P}_j = {}_jB_p \; P_p \; B_j$$

and $$\tilde{Q}_k = {}_kC_q \; Q_q \; C_k$$

Note that these final matrices are now factored in the same form as that provided by the Eckart-Young procedure referenced by Levin. Thus, we can easily see that the matrices ${}_iA_m$, ${}_jB_p$, and ${}_pC_q$ can be determined as factor matrices of the product matrices defined above. Tucker notes that this is precisely correct and that any factoring method which "produces factor matrices in which the number of columns is equal to the rank of the matrix being factored may be used" (p. 289). He later employs principal axes solutions as one possibility.

Although Levin, at this point referred to the transformation of these factor matrices to simple structure by rotation, Tucker notes that the practical problems of determining the appropriate transformation matrices have not yet been resolved and that such efforts should be considered with some caution.

As yet, we have not discussed the matrix G to any real extent. Let us now turn to Tucker's comments regarding the relations between G and X. To understand these relationships we must employ the concept of left inverses of matrices. In this case, the left inverses are defined by the following equalities

$$ {}_mA_i^* = ({}_mA_i \; A_m)^{-1} \; {}_mA_i,$$

$$ {}_pB_j^* = ({}_pB_j \; B_p)^{-1} \; {}_pB_j,$$

and

$$ {}_qC_k^* = ({}_qC_k \; C_q)^{-1} \; {}_qC_k.$$

These are read, for example, the left inverse of ${}_mA_i$ equals the inverse of the product ${}_mA_i$ times ${}_iA_m$, quantity times ${}_mA_i$. The possession of these inverses allows us to solve for G in each of the original matrix equations. That is

$$
\begin{aligned}
{}_m\overset{*}{A}_i \; \tilde{X}_{(jk)} \; ({}_j\overset{*}{B}_p \underline{X} {}_k\overset{*}{C}_q) &= {}_mG_{(pq)}, \\
{}_p\overset{*}{B}_j \; \tilde{X}_{(ik)} \; ({}_i\overset{*}{A}_m \underline{X} {}_k\overset{*}{C}_q) &= {}_pG_{(mq)}, \\
\text{and} \quad {}_q\overset{*}{C}_k \; \tilde{X}_{(ij)} \; ({}_i\overset{*}{A}_m \underline{X} {}_j\overset{*}{B}_p) &= {}_qG_{(mp)}.
\end{aligned}
$$

Of course, each of these G's contain the same elements with their only difference being the ordering of those elements. Another relation based on these left inverses that should be noted before proceeding is

$$
\begin{aligned}
{}_m\overset{*}{A}_i \; \tilde{M}_i \; \overset{*}{A}_m &= {}_mM_m, \\
{}_p\overset{*}{B}_j \; \tilde{P}_j \; \overset{*}{B}_p &= {}_pP_p, \\
\text{and} \quad {}_q\overset{*}{C}_k \; \tilde{Q}_k \; \overset{*}{C}_q &= {}_qQ_q.
\end{aligned}
$$

Then, if the coefficient matrices are column-wise sections of orthonormal matrices, the left inverses defined above are in fact the transposes of the coefficient matrices. "Then," as Tucker states, "the Kronecker product of pairs of these coefficient matrices are also column-wise sections of orthonormal matrices" (p. 292). This implies that the equations given earlier for ${}_mM_m$ ${}_kP_p$, and ${}_qQ_q$ reduce to

$$
\begin{aligned}
{}_mM_m &= {}_mG_{(pq)} \; G_m, \\
{}_pP_p &= {}_pG_{(mq)} \; G_p, \\
\text{and} \quad {}_qQ_q &= {}_qG_{(mp)} \; G_q.
\end{aligned}
$$

since in this case, the product of Kronecker products becomes an identity matrix.

While Tucker presents the foregoing discussion in much more detail than has been indicated here, it is assumed that the present discussion will allow the reader to determine the appropriateness of Tucker's operational definition of three-mode factor analysis. Given this brief theoretical background, the reader should be able to conclude that Tucker's operational proposal does in fact yield the clustering that Levin claimed existed on a logical basis and that Golding seeks.

Turning to applications, Tucker bases his discussion of these procedures on the determination of the characteristic roots and vectors of the various product matrices identified above. He uses techniques that he considers outgrowths of standard principal components and principal axes procedures in two-mode factor analysis. He also assumes that $\tilde{x}_{ijk}$ is in fact the $\hat{x}_{ijk}$ defined earlier.

Before developing the applied steps of the method, he notes the need for concern regarding the scaling of each of the three modes. He advocates the use of the type of standardization that seems most meaningful given a specific set of data and notes that the general model is not particularized to a single type of scaling of the data. The actual operationalization of three-mode for the present research employs data that have been separately standardized within each mode. This is one of three scaling options offered by Tucker and was chosen as the most useful in this case because of its ability to limit the amount of variance removed by standardization. The other options he offers involve an initial general standardization across at least two modes with another standardization taking place during the factoring of each of the separate modes. Such double standardization may remove variance that would otherwise add information to the final analysis.

Therefore, the single, separate standardization of the three modes was chosen as the best scaling technique for the present research.

Given appropriate scaling, Tucker's generalized operationalization of three-mode is quite direct. He first requires that the researcher develop the following product matrices:

$$ {}_{i}M_{i} = {}_{i}X_{(jk)}\ X_{i}, $$

$$ {}_{j}P_{j} = {}_{j}X_{(ik)}\ X_{j}, $$

and

$$ {}_{k}Q_{k} = {}_{k}X_{(ij)}\ X_{k}. $$

Then the determination of these matrices' characteristic roots and vectors yields the following (when the roots of each matrix are ordered in descending fashion on the respective diagonals of the matrices ${}_{m_2}M_{m_2}$, ${}_{p_2}P_{p_2}$, and ${}_{q_2}Q_{q_2}$ and the vectors are placed in the m_2, p_2, and q_2 modes of the vector matrices):

$$ {}_{i}M_{i} = {}_{i}A_{m_2}\ M_{m_2}\ A_{i}, $$

$$ {}_{j}P_{j} = {}_{j}B_{p_2}\ P_{p_2}\ B_{j}, $$

and

$$ {}_{k}Q_{k} = {}_{k}C_{q_2}\ Q_{q_2}\ C_{k}. $$

Finally, the core matrix is obtained from

$$ {}_{m_2}G_{(p_2q_2)} = {}_{m_2}A_{i}\ X_{(jk)}\ ({}_{j}B_{p_2} \underline{X} {}_{k}C_{q_2}), $$

and, if all nonzero roots are retained in the process, a precise fit to the observed data matrix ensues from

$$ {}_{i}X_{(jk)} = {}_{i}A_{m_2}\ G_{(p_2q_2)}\ ({}_{p_2}B_{j} \underline{X} q_2\ C_{k}). $$

Of course, only an approximation to the observed data is obtained when the factoring of the product matrices involves the truncation of small roots from m_2, p_2, and q_2. Finally, as in his earlier discussion, Tucker also advises caution with respect to transformation of these

derived modes but recommends that this issue be considered in each specific situation. Because of these unresolved difficulties in this area, transformation of G will not be attempted in the present research.

Based on the above general operationalization of three-mode factor analysis, Tucker presents three specific variations on the procedure that result in three-mode solutions. He labels these variations Methods I, II, and III. Rather than present each of these, we will conclude this discussion of three-mode factor analysis by explicating only Method I. This method is the one used in the present research since the obtained data set is small enough to permit direct factoring of all three modes. Methods II and III are alternative approximate solutions that estimate part of the factor structure when one mode involves too many variables to be factored directly.

Method I is basically a five-step process which Tucker presents as follows:

1) Compute the product matrices ${}_iM_i$, ${}_jP_j$, and ${}_kQ_k$ from the observed data matrix ${}_iX_{(jk)}$. Note that separate standardization of each of these modes allows these product matrices to be developed as correlation matrices within each mode.

2) Compute the characteristic roots and vectors of these product matrices.

3) Retain only the roots considered to be significant in some sense and form the diagonal matrices ${}_mM_m$, ${}_pP_p$, and ${}_qQ_q$ containing the roots in descending order.

4) Form the coefficient matrices ${}_iA_m$, ${}_jB_p$ and ${}_kC_q$ which contain the unit-length characteristic vectors as columns in the same order as the retained roots.

5) Compute the core matrix G by

$$ {}_mA_i \; X_{(jk)} \; ({}_jB_p \underline{X} \; {}_kC_q) = {}_mG_{(pq)}. $$

With this practically-defined analysis technique in hand, we now have a means of initiating the kind of research Golding has suggested in

order to explore interactionist perspectives. However, the term initiating is used since there is another aspect of Golding's argument which has been ignored up until this point, but which deserves consideration before the researcher can argue that he has provided a refutation of or support for some interactionist position. The second object of Golding's concern is the need to demonstrate that the clusterings derived from this analysis can be reproduced by independent measurement efforts. He says

> The discovery of response homogeneous person subclusters in a particular study cannot be unambiguously interpreted unless one can reliably replicate this cluster(ing) . . . (p. 286).

Thus, we must determine whether the clusters identified in the three-mode analysis exist in some valid form. We must demonstrate that these same clusters can be obtained from different measurement methods. This is virtually the problem of establishing the construct validity of these clusters, and therefore, we should be able to turn directly to standard psychometrics and the techniques used to develop arguments for construct validity to find a solution.

One of the most popular methods of exploring construct validity comes from Campbell and Fiske (1959). Their technique is referred to as the Multitrait-Multimethod Matrix. To assess construct validity of various traits or constructs, Campbell and Fiske first require the measurement of these traits by at least two different methods and then they intercorrelate all of the measurements. They suggest that construct validity is demonstrated a) when the same trait measured by two different methods correlates highly, and b) when different traits measured by the same or different methods correlate less than do the measurements of the same trait by two different techniques. Actually, Campbell and Fiske's

criteria are more explicitly stated in their article, but this description should suffice for the present discussion.

Note that a primary problem with Campbell and Fiske's method is the rather subjective nature of the criteria by which the researcher decides whether or not construct validity exists. Recent research in this area has been directed at this difficulty and it is with this research that we begin a description of how this technique can be employed to address Golding's concern about cluster reproducibility.

Jackson (1969, 1975) and Golding and Seidman (1974) have been concerned with this issue of the subjective nature of the Campbell and Fiske criteria. As a solution to this problem, they propose similar types of factor analysis of the multitrait-multimethod matrix. However, as Jackson (1975) notes, his method demands some a priori notions about the factor structures among traits within each of the methods, whereas Golding and Seidman's does not. Since there was no basis on which to formulate such a priori notions in the present research, Golding and Seidman's technique was used.

Golding and Seidman suggest that the way to determine the convergence of traits across methods is to a) factor analyze each of the monomethod blocks in the multitrait-multimethod matrix by principal components, b) retain all components with eigenvalues greater than 1, c) compute component scores for each individual on each component within each method, d) intercorrelate all individuals' component scores across methods and e) subject this second order matrix to principal components analysis. The resulting factor loading matrix is then examined to determine convergence by exploring the high loadings on each second order factor as in a standard factor analysis.

How does this method address the problem at hand? If we could obtain separate measures of individuals' leadership behavior in a variety of situations, we could do a three-mode analysis within each measurement type and determine the factor structure for each of the three modes as reported by each measuring device. Then, if we correlated the factor scores from one of the original modes across the various measurement types, we would have the second order correlation matrix referred to in the Golding and Seidman analysis. We would then be able to perform a principal components analysis on this matrix and assess the convergence of factors across methods. If such convergence were demonstrated, we would have an argument for the reliability of the clusterings that resulted from the three-mode analysis of each measurement method. Obviously, then, if this process were repeated for each of the other two modes in the original analyses, we would have a measure of the reliability of the clusterings in each mode of the analyses, and thus, some basis for arguing about the validity of the clusterings obtained from any one of the original three-mode analyses. This meets Golding's demand.

Let us now consider how the results of these analysis techniques would provide some resolution to the problems surrounding contingency theories.

The Issue of Hypothesis Testing

Clearly, one must conclude from the foregoing discussion that the research necessary to resolve the issue surrounding contingency theories must be descriptive. Such research must discover commonalities in various leaders and their behaviors in various situations by means of some multivariate clustering technique such as three-mode factor analysis. As is well-known, factor analysis is not a good means of testing hypotheses. Similarly the descriptive nature of the necessary research

largely precludes hypothesis testing. Therefore, rather than present research hypotheses and the expected results of tests of these notions as a summary of the application of three-mode analysis to contingency theories, we will focus on some general expectations regarding the results in light of the predictions which come from contingency theories.

Expected Core Matrices

First we will consider the necessary minimal structure that must exist in the core matrix for a generic contingency position to be supported. The interactive nature of this position implies that there must be clusters of situations and behavioral responses appearing in this core. Such minimal structure may be of a form similar to that of the example in Table 3.

TABLE 3. The General Structure of the Inner Core Matrix if Contingency Relations Exist.

	SITUATION TYPE 1	SITUATION TYPE 2	SITUATION TYPE 3	SITUATION TYPE 4
BEHAVIORAL RESPONSE TYPE 1	HIGH VALUE	LOW VALUE	MOD. LOW VALUE	MOD. HIGH VALUE
BEHAVIORAL RESPONSE TYPE 2	LOW VALUE	HIGH VALUE	MOD. HIGH VALUE	MOD. LOW VALUE

Note some characteristics of this core that are of interest. The first of these is that there are no clusters of individuals identified in the matrix. This is the way the core would appear if there were no individual differences in the enactment of leader behavior. A core of this form would lend support to a generic contingency position stated as a two-way interaction rather than as a three-way interaction. Since

it has been argued that individual differences do exist in the inactment of leader behavior, Table 3 should be modified to represent what is probably a more realistic result.

However, before discussing these modifications let us look at some of the table's other aspects that should remain as presently stated when individual differences clusters are included. First, the number of behavioral response types is limited to two. The likelihood of this finding will be discussed in a later section on data collection, but suffice it to say now that this number of clusters should remain constant.

Before modifying Table 3 we should also note that the number of situation factors is not presently hypothesized. Rather than discuss this indeterminacy, the point worthy of note is that as long as there are at least two situation clusters and two behavioral response clusters in the core, the contingency notion has support. If only a single behavioral response or situation factor emerges, such support does not exist. Now let us alter Table 3 to include some individual difference clusters. We will also limit the number of situation factors in this example to three for the sake of simplicity. See Table 4. Notice that in this example some individuals do not alter their behavior over situation types (Individual groups 1 & 2) while others do (Individual group 3). Only those leaders in this last group could be considered contingency-type leaders. While these may not be the only response patterns that might emerge, it is assumed that the other possibilities are analogous to those already presented in Table 4. Such results would support a generic contingency position.

As a final note on our considerations of potential core structure, let us look briefly at the core structure that would exist if either

TABLE 4. General Core Structure With Individual Differences Clusters

	SITUATION TYPE 1	SITUATION TYPE 2	SITUATION TYPE 3
INDIVIDUAL TYPE 1			
BEHAVIORAL RESPONSE 1	HIGH	HIGH	HIGH
BEHAVIORAL RESPONSE 2	LOW	LOW	LOW
INDIVIDUAL TYPE 2			
BEHAVIORAL RESPONSE 1	LOW	LOW	LOW
BEHAVIORAL RESPONSE 2	HIGH	HIGH	HIGH
INDIVIDUAL TYPE 3			
BEHAVIORAL RESPONSE 1	HIGH	LOW	MOD
BEHAVIORAL RESPONSE 2	LOW	HIGH	MOD

the Fiedler or Vroom and Yetton model of contingency notions was appropriate.

In the case of Fiedler, we would expect to find: a) two situation clusters--one containing situations of extreme favorableness with the other containing situations of moderate favorableness; b) two leadership behavior clusters as in Tables 3 and 4 which would contain high LPC behaviors and low LPC behaviors; and c) four individual differences clusters--two involving effective leaders (defined by matches between the type of behavior and the situation's favorableness) with the other two involving ineffective leaders (characterized by mismatches between styles and situation types).

Alternately, the Vroom and Yetton model would predict a different kind of core structure. Extending their normative model, their notions suggest a core matrix similar to that in Table 3. If their normative model of leadership were employed by all leaders, there would be no individual difference clusters. Also, the number of situation clusters would probably be rather large. Finally, their model would probably predict at least three behavior clusters. Two of these would correspond roughly to the authoritarian and participative extremes of their leadership measurement scale and the third would probably be related to the medium values on this scale. Whatever the case, the primary requirement of their core would be that situation factors should far outnumber the individual factors while Fiedler's model would predict just the opposite.

Summary

The preceding pages have shown that although an appropriate data base does not yet exist to argue for or against the meaningfulness of

contingency theories of leadership, there are methods available for obtaining such data and empirically examining this concept. We have seen that Tucker's three-mode factor analysis is amenable to the problem of locating homogeneous subclusters of similarly behaving individuals in similar situations and that such an analysis could be supplemented by a multitrait-multimethod exploration of the reliability of the resulting clusters to meet both of Golding's demands for developing the basis for such arguments regarding interactionist perspectives.

Let us now consider the research paradigm used in the present research to provide the necessary data to address these issues. Once the interactionist argument is resolved one way or the other, we can consider the value of comparing competing contingency positions such as Fiedler's and Vroom and Yetton's.

METHODS

We have now identified a major conceptual difficulty in the advocacy of interactionist positions such as those of the contingency theories of leadership, and we have discussed a method of analysis which is capable of dealing with this difficulty. Let us now operationalize this technique more concretely as we outline the methodology of the present research which is aimed at the resolution of the interactionist issue in relation to contingency theories of leadership. Our discussion will begin with the subjects used in the study.

Subjects

From three groups of 98 potential subjects, three groups of fifty-three people at various levels in four organizations agreed to voluntarily participate in a descriptive study of leadership behavior. Participation in the study involved the completion of a questionnaire which will be discussed below; thus, response rate determined the ultimate sample size.

One of these three subject groups was comprised of fifty-three leaders from the four organizations. Because the research focused on describing these fifty-three leaders' behavior, this first group was labeled the focal person sample. This sample contained 40 males and 13 females. These leaders ranged in age from 26 to 57 years ($\bar{x}$ = 38.00;σ= 8.687) and they reported having from less than 1 year of experience in their present job to 11 years experience ($\bar{x}$ = 2.981;σ= 2.613). Similarly,

their reported tenure as a manager ranged from less than 1 year to 25 years ($\bar{x}$ = 6.208;σ= 4.825) and their education beyond the eighth grade varied from 1 to 14 years ($\bar{x}$ = 7.547;σ= 2.516). Finally, they reported being from 1 to 7 levels ($\bar{x}$ = 3.542;σ= 1.725) removed from the president or chief administrator of their organization.

Part of the description of these leaders' behaviors used in the present research was based on a self-report questionnaire which these fifty-three leaders completed. However, since such self-report data are usually considered less than objective, the other two groups of fifty-three people were used to verify these focal persons' self-report data. One of these groups involved a peer of each of the leaders and the other group contained a subordinate of each leader. The members of these two groups were assumed to have had opportunity to observe a given focal person's behavior as a leader and should be able to verify the focal person's self-reports of their leader behavior. Thus, it became possible to develop three groups of equal size and have each contain a direct representative of each focal person.

In those cases where the researcher was able to have direct contact with the three groups, the members of the three samples were selected in the following manner. All the focal people who agreed to participate in the study were asked to complete the self-report questionnaire and then to identify two peers and two subordinates who could best describe the particular focal person's leader behavior. Those people eligible as peers were any individuals who were in the focal person's organization and were at the same organizational level as the focal person. Eligible subordinates were restricted to those two subordinates with the longest tenure under the focal person's leadership. After the focal person identified these four individuals, the researcher randomly selected one

of the peers and one of the subordinates to participate in the peer and subordinate groups. Only two people selected in this manner were unwilling or unable to participate in the study, so they were replaced with the alternate member of their peer or subordinate pair. All other peers and subordinates agreed to participate in the study when contacted by the researcher and they were then given a questionnaire regarding their focal person's behavior which they completed and returned to the researcher. These subjects were all allowed at least a week to complete the instrument. In those cases where the researcher could not meet with the members of the three groups, the focal people were asked to participate in the study by way of a cover letter and to give the appropriate questionnaires and their self-administering instructions to a peer and the subordinate with the longest tenure under the focal person's leadership. Upon its completion, these people were then asked to return their individual questionnaire, in a sealed envelope if they desired, to a central collection location in their organization and then these questionnaires were mailed or delivered, still sealed, to the researcher. In this way, the remaining members of the three samples were obtained as participants in the study and given the appropriate questionnaire. This latter method of subject selection accounted for about 60% of the sample in each of the three groups.

Before discussing the actual data collection technique in this research, two other issues regarding the subjects in the study deserve comment. First, to facilitate obtaining subjects without requiring several more organizations' participation in the research, subjects in one of the three groups (i.e., focal person, peer, and subordinate) were allowed to participate as members of another group if they had the proper organizational relationship with another focal person. That is, focal

people were allowed to identify another focal person as their peer or subordinate if this focal person met the requirements for membership in one of the other samples. (The same was true for members of the peer and subordinate groups who could be considered focal people.) However, for reasons of fatigue, decreased motivation, and increased interdependence in the data, subjects were advised that a single person should not participate in more than two roles in the study. In fact, two people violated this request and they each participated in three roles; no other subject participated in more than two groups. While the exact number of subjects who participated in two groups cannot be determined it is estimated to be around 30 people.

Finally, a brief description of the organizations from which the subjects came is in order. The four participating organizations were selected to provide variance in the focal person group in addition to that gained by using leaders at several organizational levels. To increase this variance the researcher sought cooperation in both the public and private sectors. In total, five organizations were asked to allow several of their supervisors and managers and their respective peers and subordinates to participate in the study on a voluntary basis. No other research support was sought from the participating groups. Of these five, three agreed to let some of their people participate immediately. In the case of the other two, they were similar organizations in terms of general management philosophies that were both confronted with the present research proposal and one other proposal simultaneously. Based on their mutual agreement, one of the two organizations decided to participate in the present research, while the other committed its involvement to the other proposed research effort.

The first organization that agreed to participate in the study is a manufacturing firm located in one of the Central Plains states. This company, while being somewhat diversified, is primarily involved in the manufacture and sale of specialized agricultural equipment and the processing of metal tubing. It employs about 1400 people, of which about 200 are in management and supervision.

The second and third organizations that participated in the study are governmental units in a large midwestern state. The second organization is a city government made up of ten departments and it has about 350 employees. It operates under a city manager form of government and is a relatively flat organization with little supervisory responsibility below the ten department heads. The third organization is part of that midwestern state's governmental structure. Only two sections of this department participated in this study but unlike the city governmental unit which had a flat structure, these two sections involved more than five organizational levels within themselves. The entire department employs about 13,000 while the two units that were in the study involve a total of about 200 people. One of these unit's primary tasks is monitoring the entire department's operations while the other is a field unit that had direct contact with the public being served by the department.

The fourth organization in the study is a manufacturer of automobile parts and is located in the western part of the same midwestern state the governmental units noted above are in. This company employs about 450 people and was chosen for the study because of its managerial emphasis on participative decision making. It should have provided some variance in leadership behavior when compared to the bureaucracies of a state government.

Given this description of the research sample, let us now consider the means by which the descriptions of a given focal person's behavior were actually obtained. This brings us to the data collection aspect of the study's operationalization.

Data Collection

Our previous discussion has shown that the appropriate way to explore interactionist positions is to employ a data analysis technique that looks at clusters of people, situations, and behavioral responses. This demands that any pertinent data collection effort involve the measurement of several behaviors in each of several situations over a sample of individuals. That is, to examine the interaction of people x situations x behavioral responses we must collect data that can be indexed in these three ways. However, as has been noted earlier, obtaining such data has been less of a problem in psychology than has been analyzing those data. Such data are readily obtained through instruments such as semantic differential scales.

Another data collection technique that provides such three-way data has been employed by Endler, Hunt and Rosenstein (1962) in their S-R Inventory of Anxiousness. These researchers were interested in studying the reported behavioral responses of individuals in various situations which may or may not be anxiety-provoking. To accomplish this, they asked people to imagine themselves in several different situations and then report how they would feel or behave in each situation. Specifically, they presented subjects with 11 situations. Some of the situations they investigated involved such events as auto trips, new dates, psychological experiments, speaking before a large group, competitive contests, etc. The behaviors included heart beating faster, emotions disrupting actions, perspiring, enjoying the challenge, becoming

immobilized, etc. The situations were presented in one or two sentence statements and the behaviors were defined as sketchily as those listed above. Subjects then reported the perceived frequency of occurrence of these behaviors when they encountered each situation by marking a five-point scale ranging from "not at all" to "very much." These endpoint's labels changed slightly with each behavior to retain contextual meaningfulness, but all were of a similar nature.

The problem confronting Endler, et al. was very similar to that posed by the present discussion in that both are concerned with a person x situation x behavioral response interaction. Therefore, it seemed useful for the present study to pursue a data collection technique analogous to theirs. The utility of such an approach is also supported by the fact that Levin (1965) showed the amenability of the Endler, et al. data to three-mode factor analysis. Thus, at both a conceptual and operational level, the Endler, et al. data collection technique appears useful for the present research.

This technique demands a questionnaire in which several situations are followed by questions regarding several behaviors. Since much of the previous leadership research has also employed questionnaires regarding leader behavior, some insight was gained from this research, making the construction of the present questionnaire less difficult.

Since the early 1950's when the Ohio State leadership research was begun, a fair amount of work has gone into devices for measuring leader behaviors. Probably the best known result of this work is a revised form of the Ohio State LBDQ referred to early in this paper. Factor analyses of this instrument continually show the tendency for leader behaviors to cluster into two major groups (Schreisheim & Kerr, 1974). Other research, such as the University of Michigan studies, tends to

support this notion of two major dimensions of leader behavior. While these and other researches (e.g., Johnson, 1973) have shown that other dimensions of leader behavior may also exist, all the studies indicate that two dimensions can adequately account for the major portion of the variance in these behaviors. These dimensions usually have a form similar to the Initiating Structure and Consideration factors that came from the Ohio State research. Because of this finding, the present research will only concern itself with the measurement of these two major dimensions of leader behavior.

In using the LBDQ, subordinates describe their leader's behavior on these two dimensions by responding to two sets of ten items which are the scales for each dimension. Leaders use similar scales to describe their own behavior on another form of the LBDQ, the Leadership Opinion Questionnaire (LOQ). In each case these items have been repeatedly identified as measures of the respective dimensions (Schreisheim & Keer, 1974). But asking a subject to respond to 20 behaviors in relation to each of several situations would have made the present questionnaire inordinately long. We needed a shortened version of each of these scales.

Such shortened scales have been developed by Johnson (1973). He constructed five-item scales to measure each of these dimensions. Hill (1976) has shown that these short scales correlate quite well with their longer counterparts and he and Lowman (1975) have also shown that these short scales have reasonable internal consistencies (alphas usually ranging from .70 to .90). The only exception to this trend is Lowman's finding of an alpha in the .50's for the Initiating Structure scale. In both cases, it seems that shorter, but reasonably reliable measures of each of these dimensions were obtained. Therefore, the present research used Johnson's scales, but in a slightly altered form which

adapted them to the present context. These items are given in Table 5a as they appeared on the questionnaire given to focal persons and in Table 5b as they appeared for the peer and subordinate samples. The behaviors are all stated in an expectation format to allow responses where actual behaviors may not have been observed. The response scale from the LBDQ was attached to each item. Subjects were asked to report the frequency of occurrence of these behaviors as A - Always, B - Often, C - Occasionally, D - Seldom, E - Never on this scale as explained in standardized instructions presented prior to the administration of the questionnaire. Possible method effects due to this ordered, standardized presentation of the behavior response items will be discussed in conjunction with the results.

Before going on to consider the situational content of the questionnaire, it seems likely that the reader may have some questions regarding the legitimacy of such a two-dimensional measurement tool in a descriptive study of leader behaviors which is aimed at clustering those behaviors. Let us briefly address this question. It may seem that the factor analysis of the behavioral response mode in this research effort is destined to produce exactly two factors. This is a reasonable argument that is readily conceded by the author. However, this deterministic view of the results is also considered desirable since many research efforts have repeatedly demonstrated this two dimensional aspect of leader behavior. It therefore seems prudent to build on this wealth of research and incorporate these findings in the present design. Given this reasoning, we will go on to consider the situational nature of the questionnaire used in this research.

Unlike the leader behavior domain where there seems to be some empirical consensus regarding the dimensionality of the construct,

TABLE 5a. Leadership Behavior Descriptions for Focal Person Sample

I.	I would expect to schedule the work for my subordinates.
2.	I would expect to see to it that my subordinates have the materials they need to work with.
3.	I would expect to make sure my subordinates understand my position in the group.
4.	I would expect to maintain definite performance standards for my subordinates.
5.	I would expect to let my subordinates know what is expected of them.
6.	I would expect to help a new member adjust to my group of subordinates.
7.	I would expect to make subordinates feel at ease when talking with them.
8.	I would expect to look out for my subordinates' personal welfare.
9.	I would expect to be friendly and easily approached.
10.	I would expect to express appreciation when a subordinate does a good job.

TABLE 5b. Leadership Behavior Descriptions for Peer and Subordinate Samples

1. I would expect him/her to schedule the work for his/her subordinates.
2. I would expect him/her to see to it that his/her subordinates have the materials they need to work with.
3. I would expect him/her to make sure his/her subordinates understand his/her position in the group.
4. I would expect him/her to maintain definite performance standards for his/her subordinates.
5. I would expect him/her to let his/her subordinates know what is expected of them.
6. I would expect him/her to help a new member adjust to his/her group of subordinates.
7. I would expect him/her to make subordinates feel at ease when talking with them.
8. I would expect him/her to look out for his/her subordinates' personal welfare.
9. I would expect him/her to be friendly and easily approached.
10. I would expect him/her to express appreciation when a subordinate does a good job.

researchers do not seem agreed on the dimensions underlying differences in situations. Part of the reason for this divergence of opinion may be that in actuality there are many dimensions among situations. However, some researchers have tried to reduce the dimensions to a manageable number. Fiedler, as we have seen, hypothesizes two kinds of situations with regard to leader behavior. These are situations of extreme favorableness or unfavorableness and situations of moderate favorableness. Vroom and Yetton propose several situational dimensions. Kerr, et al. (1974) propose three dimensions among situations. But the question remains unanswered. What are the dimensions of the leadership situations?

Because of this indecision regarding such dimensionality the present research chose to follow the Endler, et al. lead and simply select, on an a priori basis, several situations and explore the relations among them in a descriptive manner. The selected situations were considered some of the many that appear common to virtually all leadership roles, but which appear diverse enough to prompt differential behavioral response. To assure commonality across various organizations and in an effort to closely follow the Endler, et al. data collection technique, these situations were only generally described in a sentence or two and the respondent was expected to provide additional structure as his/her experience dictated. Statements of the situations used on the focal persons' questionnaires can be found in Table 6a. Table 6b presents the situations as given to the peer and subordinate samples. The combination of these situational statements and the behavioral response statements resulted in the questionnaires that were given to the focal people and to the peers and subordinates. Copies of these questionnaires and the instructions for completing them can be found in

TABLE 6a. Leadership Situations Presented to Focal Person Sample

Situation 1:	Your most pressing need is to fire a subordinate who is clearly incompetent.
Situation 2:	Your most pressing need is to markedly improve the quality of your work group's output or service in the next 30 days.
Situation 3:	Your most pressing need is to deal with a single complaint that comes from more than 50% of your subordinates.
Situation 4:	Your most pressing need is to convince your subordinates that a recently received change in organizational policy is necessary and reasonable. You agree with the change.
Situation 5:	Your most pressing need is to demonstrate the competence of your work group to your immediate boss.
Situation 6:	Your most pressing need is to negotiate a compromise over a conflict in priorities between your work group and another group whose activities directly control your group's ability to accomplish its task.
Situation 7:	Your most pressing need is to submit a 6-month budget for your department within the next week.
Situation 8:	Your most pressing need is to decide whether or not your work group will accept an extra heavy work load. If you don't accept, your boss will give the work and any rewards to another group.
Situation 9:	Your most pressing need is to have your work group handle an emergency change in its work schedule for today.
Situation 10:	Your most pressing need is to resolve a major conflict between two members of your work group.

TABLE 6b. Leadership Situations Presented to Peer and Subordinate Samples

Situation 1:	His/her most pressing need is to fire a subordinate who is clearly incompetent.
Situation 2:	His/her most pressing need is to markedly improve the quality of his/her work group's output or service in the next 30 days.
Situation 3:	His/her most pressing need is to deal with a single complaint that comes from more than 50% of his/her subordinates.
Situation 4:	His/her most pressing need is to convince his/her subordinates that a recently received change in organizational policy is necessary and reasonable. He/she agrees with the change.
Situation 5:	His/her most pressing need is to demonstrate the competence of his/her work group to his/her immediate boss.
Situation 6:	His/her most pressing need is to negotiate a compromise over a conflict in priorities between his/her work group and another group whose activities directly control his/her group's ability to accomplish its tasks.
Situation 7:	His/her most pressing need is to submit a 6-month budget for his/her department within the next week.
Situation 8:	His/her most pressing need is to decide whether or not his/her work group will accept an extra heavy work load. If he/she does not accept, his/her boss will give the work and any rewards to another group.
Situation 9:	His/her most pressing need is to have his/her work group handle an emergency change in its work schedule for today.
Situation 10:	His/her most pressing need is to resolve a major conflict between two members of his/her work group.

Appendices A and B, respectively. The focal people used the instrument to describe their own behavior in these situations while peers and subordinates used their instrument to describe the behavior of their respective focal person.

Data Analysis

After the focal people, peers and subordinates returned their questionnaires, the data were prepared for computer analysis. The frequency response options were scaled from 5 (always) to 1 (never) and the data were coded and punched accordingly. Missing data points were assigned a median scale value of 3 because 1) it was decided that the small number of missing data points (less than .25% of the total data set) would result in minimal differences between various replacement options, thus making the easiest substitution the most practical; and 2) this permitted the elimination of missing data at the coding stage rather than requiring additional computer storage and usage to handle missing data in all analyses when the occurrence of such data was infrequent.

Each respondent group's data were coded three different ways. Using i as the index for subjects, j for situations and k for behavioral responses the data points were entered into 1) an ${}_{(jk)}X_i$ matrix; 2) an ${}_{(ik)}X_j$ matrix; and 3) an ${}_{(ij)}X_k$ matrix. Recall that the first of these is a matrix which has $(N_j \times N_k)$ rows and N_i columns. Thus, with 10 situations and 10 items and 53 subjects in a given group, ${}_{(jk)}X_i$ is a matrix of order 100 x 53. Similarly, the other two matrices are of order 530 x 10 since their combination modes involve the subjects in the study. Upon their completion, these matrices were used to form the product matrices ${}_iA_i$, ${}_jB_j$, and ${}_kC_k$ required for the first step of the three-mode analyses. In the present research, these product

matrices involved correlations and, thus, the data were standardized within each column mode as discussed earlier in Tucker's mathematical presentation of three-mode analysis.

Given three such product matrices for each of the these respondent groups, the research completed the separate three-mode analyses for focal people, peers, and subordinates by determining the characteristic roots and vectors of these matrices and combining them with the ${}_{i}X_{(jk)}$ matrix for each group in the manner outlined by Tucker's Method 1. Note that in so doing, ${}_{i}X_{(jk)}$ was employed in both an unstandardized and a standardized form. This was done to avoid removing an excessive amount of information due to standardization in the three-mode analysis as cautioned by Levin (1965). When employed, the standardization of ${}_{i}X_{(jk)}$ was within the subject mode so the variance removed would be that due to subjects and not that due to situations or behavioral responses since the latter variances are necessary to understand the generic interactionist perspective of contingency theories. This equated the responses of all subjects with respect to their means and variances.

Concomitant with the determination of the characteristic roots and vectors of the three product matrices for each of the respondent groups was the calculation of factor scores for the cases in each analysis based on the resulting factor structure of these matrices. These factor scores were computed in standard fashion and were based on varimax rotations of principal components solutions of the product matrices.

The factor structures of the ${}_{i}A_{i}$ product matrices for each of the three respondent groups were then intercorrelated using the factor scores previously calculated as the measures of each variable (i.e., factor). Similar correlation matrices were produced across the focal person, peer

and subordinate groups for the ${}_jB_j$ and ${}_kC_k$ product matrices' factor structures. These three intercorrelation matrices were then analyzed using principal components followed by a varimax rotation of each solution. This process constituted the Golding and Seidman analysis discussed above which provides a means of comparing the factor structures resulting from the analysis of one of the three original modes across the three respondent groups. It is the test of the reproducibility of the factor structures resulting from the focal persons' self-report data.

Finally, to address the controversy between a strong trait as opposed to a strong situational view of contingency theories, a multitrait-multimethod matrix was constructed for each respondent group and was decomposed by way of the Stanley (1961) ANOVA model for determining trait and method variance in a multitrait-multimethod matrix. In the present case, the 10 situations comprised the methods and the 10 behavioral response items were the traits measured under each of these "methods."

Use of the ANOVA model requires the computation of three average correlations from the multitrait-multimethod matrix. These are the average interitem correlation in the entire matrix (including the unities on the diagonal), the average validity diagonal value (including the self-validity main diagonal which contains 1.00's) and the average interitem correlation in the monomethod blocks of the multitrait-multimethod matrix (including the 1.00's on the diagonals of these blocks). These values were computed from each respondent sample's multitrait-multimethod matrix and were used with Stanley's ANOVA computational formulae to arrive at a test of trait versus situation variance.

Feedback of Results to Organizations

Before presenting the results of the research, one final methodological issue deserves comment. This topic involves the means by which the results of the study were fed back to the participants in the research.

Basically, the feedback was of two types: the presentation of the general results of the study to all participants and any organizational leaders interested in receiving feedback regarding the study; and individual feedback given to the focal people in the study. The first type of feedback was an open letter which discussed the general findings regarding contingency theories, similarities and differences between the perceptions of the three respondent groups, and implications of the research results for leadership training or development. The second form of feedback was more specific. It presented each leader with a description of how he/she perceived him/herself in comparison to other leaders in the study as well as with a rough measure of the consistency of the leader's self-perceptions compared to those of his/her peer and subordinate. Examples of the forms used to present these types of feedback information are provided in Appendix C of this document.

The comparison of the leader to other leaders in the sample was accomplished by first describing how the individual difference factors revealed in the study were interpreted, and then showing each leader how they rated themselves on each of these factors by employing a modification of the "stem and leaf diagram" technique used by Wainer, et al. (1973). This technique is a graphic illustration of the factor structure in which each factor is a line or axis. Then, a given person's relative relation to the factor is depicted by plotting his/her factor loading on the appropriate factor's line. This point constitutes

the leaf. Each subject thus has a means of visually comparing his/her relative position on each of the factors.

Quite simply, the primary measures of consistency between a focal person and his/her respective peer and subordinate were two correlations. One of these was the correlation between the focal person's responses and his/her peer's responses; the other was the correlation between the focal person and his/her subordinate. A secondary consistency measure that was provided was the correlation between the respective peer and subordinate. These two pieces of information allowed the focal person to estimate the consistency of his/her perceptions of his/her own behavior compared to other people's perceptions of that same behavior.

RESULTS AND DISCUSSION

Given the foregoing discussions on theoretical and methodological issues regarding the interactionist perspective of contingency theories of leadership, we will now consider the results of the present research and their interpretation in light of such theories. Interpretations will be presented in conjunction with the results to facilitate the reader's use of the numerous tables required to describe the results of the study.

Response Rate

The percentage of subjects who actually returned completed questionnaires varied greatly among the four organizations involved in the study. In the agricultural equipment manufacturing firm, the leader who approved the organization's participation in the study predicted that from 30 to 50 leaders could potentially participate. However, only 16 leaders and their peers and subordinates actually returned completed instruments, thus response rate was, at best, about 53%. It should be noted at this point that geographical distance prevented the present researcher from actually meeting any of the subjects in this firm. Rather, the instruments were administered via a cover letter and additional on-site explanation made available through a Ph.D. in Industrial Psychology. This person was Director of Human Resources Development for this organization. This contact factor may have affected response rate; however, it is assumed that differences in administrators of the instrument should not affect the data greatly because the questionnaires all have

self-administering instructions and all respondents were offered total confidentiality in the sense that only the present researcher examined and analyzed their results.

In the two governmental units, response rates were somewhat higher. In both cases, the present researcher had direct contact with a majority of the focal people and several peers and subordinates. In the city governmental unit, 7 of the 10 department heads who verbally agreed to participate as focal people actually returned completed questionnaires. Complementary peers and subordinates for all 7 also completed the instrument. Thus a 70% response rate was obtained. In the state governmental unit, 28 leaders were offered as potential participants as focal people and all 28, along with their peers and subordinates, returned completed questionnaires, yielding a 100% response rate for this organization. In part, the higher response rates in these two groups are probably due to the fact that the researcher was able to personally remind subjects of their agreement to participate. However, fairly high response rates were obtained, even before any reminders were used.

In the fourth organization, as in the first, the researcher relied on a Ph.D. staff Industrial Psychologist to administer, clarify, and collect the questionnaires. Ten first line supervisors were administered questionnaires as focal people. Three of these 10 returned the instruments and only two of these three had peers and subordinates return completed questionnaires. Thus, response rate dropped to 20% in this organization. The one focal person who completed a self-report questionnaire but had no peer or subordinate counterpart was dropped from the analyses.

Before concluding these remarks on response rate, the reader is asked to note the differences in respondent groups which should tend to maximize variance in perceptions of leaders' behaviors across situations. The use of two units from different governmental structures along with two manufacturing groups from different parts of the country should provide diversity in the perceptual sets of the study's respondents. Similarly, sampling across several organizational levels within each of these groups should also introduce additional variance in the data. These factors would tend to maximize both situational and individual difference variance in the obtained data. Bearing these considerations about response rates and respondent groups in mind, let us now go on to the results of the study as they were observed.

Three-Mode Factor Analyses

Focal Person Sample. The first step in examining the empirical basis of contingency theories of leadership is the identification of clusters of people, situations, and behavioral responses. This is the function of the first portion of the three-mode factor analysis procedure. The determination of the characteristic roots and vectors (i.e., eigenvalues and eigenvectors) of the ${}_iA_i$, ${}_jB_j$, and ${}_kC_k$ matrices locates such clusterings. Upon factoring, ${}_iA_i$ from the focal person sample yielded 11 eigenvectors with corresponding eigenvalues greater than 1.00. These are reported in Appendix D, Table D.1. Their corresponding varimax rotated principal components are reported in Table 7 where the factors are listed as columns and individual subjects are rows. These 11 factors explained 75.9% of the total variance among the focal people. Based on this solution, we can conclude that there probably are at least 11 different groups of people in our sample. Note that this analysis has been checked to assure that the factors are still

TABLE 7. Varimax Rotated Principal Components of Individuals Focal Person Sample

IND	1	2	3	4	5	6	7	8	9	10	11
1	.30	.05	.28	-.01	.52*	.34	.27	-.05	.00	.18	.24
2	.02	.08	.13	.12	.16	.15	.21	.00	.05	.85*	-.03
3	.45	.30	.01	.28	.01	.15	.45*	.02	-.07	.21	.32
4	-.07	-.13	-.02	-.16	.22	.66*	.24	.35	.25	.03	.10
5	.18	-.00	.25	-.07	-.06	.17	-.03	.80*	-.02	-.06	.01
6	.14	.13	-.29	.75*	.06	-.16	.01	-.12	.15	.02	.32
7	.21	.12	.23	.02	-.10	.79*	.10	.08	.01	.10	.02
8	.84*	-.05	-.15	-.17	.29	.13	.06	.09	.06	-.02	-.01
9	.35	-.21	-.08	.36	.40	.10	.11	.22	.45*	.13	.07
10	.35	.30	.02	.35	-.15	-.03	-.03	-.11	-.25	.02	-.56*
11	.57*	.43	-.02	.00	-.17	.16	.18	-.11	.04	.10	.23
12	.15	.65*	.30	.18	.01	.08	.03	.10	-.11	.18	.01
13	.14	.03	.01	.78*	.13	.18	.05	-.06	-.03	.12	-.03
14	.80*	-.13	.13	.09	.05	.29	.08	.28	-.06	.06	.04
15	.58	.63*	.10	-.01	.06	.18	.16	-.02	.02	-.08	-.12
16	.21	.71*	.03	.29	-.13	-.11	-.08	-.20	-.33	-.04	-.03
17	.38	.27	.58*	.22	-.13	.11	-.01	-.25	.04	.20	-.00
18	.60*	.49	.01	.25	.03	-.04	-.14	.33	.08	-.16	-.08
19	.59*	-.07	.11	-.29	.15	.10	.35	-.05	-.01	-.07	.23
20	.29	.61*	-.09	-.02	.16	.16	.06	.16	-.12	.31	.01
21	.45	.51*	.43	-.32	.20	.15	.10	-.05	-.03	.19	.14
22	.19	.34	.29	.15	-.20	.25	.05	.30	-.08	-.13	.50*
23	.91*	.15	-.10	.20	-.19	.01	-.04	-.02	-.14	-.01	-.03

TABLE 7 (Cont'd.).

IND	1	2	3	4	5	6	7	8	9	10	11
24	.64*	.32	-.05	.36	-.03	.03	.08	.35	-.23	-.07	-.06
25	.03	.74*	-.15	.17	.18	-.08	-.04	-.06	.26	.03	.13
26	.74*	.31	.17	.07	.00	.09	-.02	-.11	-.11	.10	.06
27	-.22	.03	.16	-.36	.65*	.34	-.01	.06	.08	-.10	.10
28	.24	-.07	.09	.24	.14	.70*	.05	-.05	.05	.09	.02
29	-.01	-.07	.27	-.09	.21	.22	.29	.03	.74*	.02	.07
30	-.39	.04	.46*	-.22	.14	.20	-.00	-.10	-.43	.07	.27
31	.05	-.04	.71*	.00	.19	.01	.12	.23	-.02	-.07	.22
32	-.40	-.14	.49*	-.04	.30	.42	.26	-.13	-.07	.01	.08
33	.08	.45	.29	.55*	.03	.22	.11	.25	.01	-.21	-.18
34	.41	.17	.38	.46*	-.02	.05	-.17	-.05	-.09	.01	.41
35	.45	-.06	.04	.37	-.26	.47*	.28	-.04	-.11	.16	.09
36	.31	.10	.06	.40	.19	.11	.15	.47*	-.37	-.01	.15
37	.39	.16	.29	.06	.15	.40*	.33	.27	.03	-.14	-.04
38	-.15	.38	.71*	-.20	.18	.12	.26	.14	.18	-.05	-.05
39	.46	-.09	.62*	-.00	.06	.21	.13	.09	-.05	.14	.10
40	-.11	.17	.08	.26	-.11	-.07	.25	-.63*	-.28	-.17	-.06
41	.53	-.10	.55*	.10	.16	.07	.16	-.03	.16	.12	-.03
42	.03	-.03	.19	.08	.01	.13	.82*	-.04	.17	.19	-.02
43	-.05	-.45	.25	.04	.41*	.17	.08	-.07	-.14	.18	-.09
44	.72*	.26	.05	.13	.22	.12	-.17	.14	.18	.01	-.05
45	.22	-.25	.30	-.01	.43*	.16	.12	-.03	.24	.23	.18
46	-.02	-.08	.27	.06	.10	.15	.83*	-.07	.04	.03	-.00
47	.16	.21	.05	.19	.68*	-.24	.01	.02	.15	.13	-.15

TABLE 7 (Cont'd.).

IND	1	2	3	4	5	6	7	8	9	10	11
48	.58*	.26	.39	.03	.12	.26	.22	.18	.19	.04	-.11
49	-.04	.18	.23	.79*	-.19	.06	.08	-.04	-.09	.03	-.04
50	-.27	.12	.68*	.18	-.10	.06	.29	.07	.09	.06	-.25
51	.78*	.38	-.02	.19	.12	-.04	.02	-.03	.17	-.03	.06
52	.82*	.04	.03	.15	-.19	-.09	.16	.19	.01	.09	-.06
53	-.10	-.82*	-.20	-.05	.17	.22	.18	.11	.19	.14	.16
Eigenvalues:											
	13.50	7.18	4.55	3.32	2.49	2.29	1.85	1.60	1.21	1.13	1.04
Percentage of variance:											
	25.6	13.5	8.6	6.3	4.7	4.3	3.5	3.0	2.3	2.1	2.0

Note: *Marks the highest loading for each individual

reported in the same columnar order as the eigenvectors in Table D.1. Therefore, 1 in Table 7 corresponds to 1 in Table D. 1. The same will be true for all rotated matrices that follow.

The resolution of the focal person sample's situation matrix, ${}_jB_j$, into its characteristic roots and vectors was not as bountiful in the number of factors produced. In fact, only one eigenvalue greater than 1.00 emerged along with its eigenvector. The principal component of this solution is reported in Table 8 and it accounts for 65.8% of the total variance among situations as reported by the focal people. Note that the ten situations in Table 8 are listed in the same order as those of Table 6a. This principal component's eigenvector is shown in Appendix D, Table D.2. As the reader recognizes, a single factor cannot be rotated, therefore Table 8 simply reports an unrotated component. Based on these findings, we must conclude that there is only one cluster or type of situation as perceived by the members of the focal person sample.

Finally, the factoring of the behavioral response matrix, ${}_kC_k$, for the focal person sample resulted in three eigenvectors which had eigenvalues greater than 1.00. These three factors account for 59.5% of the variance among the behavioral response items as reported by the focal people, and their rotated principal components are given in Table 9. Behavioral response numbers in this table correspond to those of Table 5a. The eigenvectors of these principal components are reported in Appendix D, Table D. 3. In this case, we must conclude that at least three different types of behavioral responses are perceived by the focal people.

Now that we have identified the clusterings of people, situations and behavioral responses, the question which must be answered in relation

TABLE 8. Principal Component of Situations

Focal Person Sample

Situation	Unrotated Principal Component
1	.81
2	.78
3	.83
4	.86
5	.87
6	.84
7	.77
8	.85
9	.69
10	.80
Eigenvalue	6.58

TABLE 9. Varimax Rotated Principal Components of Behavioral Responses

Focal Person Sample

Behavioral Response	Rotated Principal Components 1	2	3
1	.14	-.14	.84*
2	.59*	.14	.37
3	.76*	.09	-.07
4	.72*	.12	.13
5	.83*	.07	.04
6	.35	.55*	-.32
7	.01	.84*	.11
8	.20	.58*	-.10
9	.06	.83*	.09
10	.07	.48	.54*
Eigenvalues	3.08	1.67	1.20
Percentage of Variance	30.08	16.7	12.0

Note: *Marks the highest loading for each behavioral response item.

to contingency theories is, do these clusterings interact in a systematic fashion? This is the question that the three-mode factor analysis model is designed to answer. By completing the three-mode analysis, using the combination equation of Method I, we arrive at a description of the interrelation between these clusterings in a core matrix ${}_{m}G_{(pq)}$. The core obtained in this way from the focal person data is reported in Table 10. Note that this core matrix is untransformed which means that it has not been rotated to simple structure. Remember Tucker's cautions in this regard. Note also that the core values obtained when ${}_{i}X_{(jk)}$ contained unstandardized raw data are reported in parentheses below their respective standardized counterparts. Standardization of ${}_{i}X_{(jk)}$ removed intraindividual variance and thus resulted in a core that is less apt to be affected by individual biases such as halo. Only the standardized values will be discussed but the unstandardized values are provided for the reader's information. The reader will recall that these standardized values are analogous to factor scores interrelating the three separate modes of analysis; thus, they range from about +3.00 to -3.00.

Initial inspection of this core reveals that because there was only one situation cluster, the behavioral response item clusters need not be identified more than once in the combination mode (pq). More importantly, this finding of only one situation cluster has a direct implication for contingency theories. Regarding these focal people's responses, there can be no situation x behavioral response interaction because there is only one situation factor. This means that the focal people in this sample individually report consistent behavior patterns across all 10 situations on the questionnaire. Thus, a generic contingency theory is unnecessary to describe the focal people's self-reports.

TABLE 10. Untransformed Core Matrix $m^{G}(pq)$

Focal Person Sample

Individual Factor	Behavior Factor 1	Behavior Factor 2	Behavior Factor 3
1	.98 (251.16)	-.85 (7.42)	-1.88 (35.64)
2	-.27 (85.76)	2.93 (22.07)	1.24 (25.73)
3	.29 (-27.85)	1.34 (6.17)	-2.16 (-21.33)
4	.01 (43.58)	-.06 (.80)	.27 (10.79)
5	.03 (31.22)	-.11 (.19)	-.22 (4.86)
6	-.10 (3.75)	-.09 (-.64)	-.13 (.85)
7	-.01 (-2.37)	.01 (.81)	.28 (2.06)
8	-.08 (21.10)	.21 (3.35)	-.02 (3.85)
9	.02 (9.43)	.07 (1.70)	-.05 (1.64)

TABLE 10 (Cont'd.).

Individual Factor	Behavior Factor 1	Behavior Factor 2	Behavior Factor 3
10	-.02 (-12.97)	-.06 (-1.02)	.19 (-1.05)
11	.03 (13.11)	.01 (.91)	-.09 (1.65)

However, before the reader jumps to unwarranted conclusions, two other aspects of this core matrix must be considered before we can understand how these focal people describe their own leadership behavior. First, the finding of 11 individual factors indicates that although a given subject may make consistent responses across all ten situations, there are a large number of individual differences in relation to this consistency issue. It appears that people report different kinds of consistencies. It is in understanding these differences that the core matrix becomes most helpful. It identifies the systematic relations between the individual difference factors and the behavioral response factors. This provides a means of interpreting the individual difference factors based on behavioral differences between the leaders rather than on personality or biographical differences.

Based on the rotated principal components of ${}_{k}C_{k}$ in Table 9, and on a consideration of the content of the behavioral items which load highest on a given factor of this matrix, we find the following with regard to the behavioral response factors. The first response factor is concerned with initiating structure. Four of Johnson's five initiating structure items load highest on this first factor. These items relate to the behaviors of providing materials for subordinates to work with, making clear one's leadership role in the group, maintaining performance standards, and letting subordinates know what is expected of them. The second response factor relates to the consideration dimension. As before, four of Johnson's five items for this scale load highest on this second factor. These are the behaviors of helping new members adjust to the work group, making subordinates feel at ease when talking to them, looking out for subordinates' personal welfare, and being friendly and easily approached. Finally, the third

factor is most closely defined by the single behavior of scheduling work for subordinates. Although expressing appreciation for a job well done also loads on this factor, it has a rather high loading and similar content in relation to the second factor defined above, making its correct location less clear. Thus, we will consider the three factors to be initiating structure, consideration and scheduling work. These interpretations allow us to proceed with the behavioral response characteristics of the individual difference factors based on the interpretation of the core values.

Looking at the first row of Table 10, we find the first individual difference cluster characterized by a positive value on the first behavior factor and negative values on the second and third factors. Given our interpretation of these three factors it would follow that the first individual factor be identified by a positive orientation toward initiating structure and a negative orientation toward consideration. It is also marked by a strong negative relationship with the scheduling work factor. All such positive and negative relationships are interpreted as descriptive of higher and lower behavioral emission frequencies, respectively.

The second and third individual difference factors are less closely related to the initiating structure factor, but both show strong relationships with the consideration and scheduling work factors. In the case of Individual Factor 2 we find fairly strong positive orientations toward both behavior factors while in Individual Factor 3 we observe a positive orientation toward the consideration factor and a negative orientation toward the scheduling work factor.

After considering the nature of these first three individual factors, one might hastily conclude that all the other values in the core are

random deviations around .00 and therefore they are not capable of providing insight into the behavioral response patterns of the other individual factors. While it is agreed that the absolute values of the remaining relationships in the core are not large, they do not appear to be totally random. There are only two individual factors in the remaining eight that display the same pattern of positive and negative relationships to the three behavior factors. The remaining 6 factors all have uniquely patterned relationships. Thus, the reader may carefully continue to characterize each individual factor in terms of low-valued, but uniquely patterned relationships with the behavior response factors, if desired. But we have already seen that the eigenvalues associated with the vectors that are producing these patterns may be too low to allow reliable interpretation.

Given the foregoing interpretation of the results of the three-mode analysis, we must now concern ourselves with the issue of the accuracy of such self-report data. To do so, we will first examine the three-mode solutions of the peer and subordinate data sets. The results of these analyses follow.

Peer Sample. Determination of the eigenvalues and eigenvectors of the ${}_{i}A_{i}$ matrix in the peer sample resulted in 13 vectors with eigenvalues greater than 1.00. (See Appendix D, Table D. 4). This solution accounted for 74.6% of the variance in the peers' descriptions of their respective focal people, indicating that this solution is fairly complete in its description of the data. As in the case of the focal person data, the eigenvectors of the peers ${}_{i}A_{i}$ were transformed into principal components and were then submitted to a varimax rotation. These results are reported in Table 11. It appears that

TABLE 11. Varimax Rotated Principal Components of Individuals

Peer Sample

IND	1	2	3	4	5	6	7	8	9	10	11	12	13
1	.10	-.04	.02	.09	.07	.84*	-.00	-.02	.02	-.01	-.08	.18	.11
2	.35	.09	-.11	.18	.07	.13	.02	-.06	-.08	-.02	-.02	.73*	-.03
3	.23	-.02	.56*	-.22	.31	.21	.16	-.24	-.08	.04	.02	-.03	.10
4	.19	.48	.13	-.10	.24	.16	.14	-.09	.13	.52*	.06	.01	-.01
5	-.01	-.03	-.52*	-.08	.15	.13	.30	.21	.35	.18	.07	.35	-.13
6	.12	.36	.66*	.08	-.07	.02	.09	-.07	-.11	.15	.14	.21	-.17
7	.34	.16	-.20	-.10	.07	.37	.40	-.41*	.07	-.17	.14	.28	-.11
8	-.25	.32	.65*	-.13	-.23	-.08	-.06	-.04	.18	.24	.03	.03	-.07
9	.26	.07	.17	-.46*	.15	.09	.30	.11	-.07	.40	-.22	.07	.01
10	.00	.22	.08	-.06	.41	-.25	.23	.12	.03	.04	.19	.49*	.21
11	-.02	-.12	.22	.41	.06	.11	.11	-.24	-.02	.51*	-.18	.17	.33
12	.26	.14	.55*	.06	.08	.24	-.00	-.06	.41	.04	-.21	.13	.15
13	.11	-.20	.15	.08	-.38	.54*	-.03	.19	-.07	.36	.02	-.04	-.05

TABLE 11 (Cont'd).

IND	1	2	3	4	5	6	7	8	9	10	11	12	13
14	.05	.78*	.12	.33	.07	-.18	.16	.05	-.02	-.02	.06	.02	.12
15	-.07	-.04	.11	-.01	.14	-.12	-.01	-.03	.80*	.08	-.05	-.01	.03
16	-.06	-.13	.27	-.01	.08	.17	.02	-.17	.35	.12	-.01	.56*	.21
17	.04	.32	.20	.49	-.06	.09	.06	.03	.49*	.10	.10	.31	.08
18	-.04	-.09	.06	.04	.12	-.06	-.04	.09	-.31	.08	.72*	.17	.12
19	-.07	.53*	-.26	.28	.16	-.47	-.07	-.07	.04	.01	-.22	-.05	.04
20	.17	-.19	.51*	-.05	.00	.05	-.05	.17	.38	.44	.21	.01	-.17
21	.09	.09	.08	.08	.06	-.03	.22	-.23	.25	.07	.73*	-.13	-.01
22	.61*	.01	-.10	.36	.21	.05	-.14	.28	-.08	-.26	.03	-.15	.07
23	.17	.12	.08	-.03	.18	-.08	-.02	.02	.15	.59*	.26	.00	.05
24	.22	.11	.52*	.37	-.25	.27	.02	-.28	.20	-.16	.04	.31	.07
25	-.07	.05	-.87*	-.07	.14	.03	.14	-.06	-.18	-.14	-.04	.01	.11
26	.31	.07	-.13	-.04	.09	.15	.10	.00	.06	.12	.16	.14	.71*
27	-.27	.22	.19	-.33	-.25	-.05	.09	-.29	-.02	.49*	-.12	.01	.21
28	-.00	.23	.17	.23	.11	-.48*	.15	.28	.27	.13	.19	.23	-.11

TABLE 11 (Cont'd.).

IND	1	2	3	4	5	6	7	8	9	10	11	12	13
29	.14	.04	.16	.27	.08	.12	-.03	.68*	.21	.05	-.05	.04	-.08
30	.31	.17	-.21	.71*	.23	-.08	.06	.12	.11	.00	-.10	.11	-.05
31	.19	.26	.07	.58*	.08	.14	.28	-.12	-.04	-.06	.20	.13	.11
32	.09	-.48	.09	.60*	-.06	-.03	.12	.09	-.10	-.04	.04	-.10	-.19
33	-.04	.26	-.03	.03	.75*	.01	.15	.08	.08	.06	.12	.07	.00
34	-.03	.93*	.12	-.04	-.08	.02	.05	-.07	-.07	-.02	.03	.06	-.01
35	.38	-.04	-.21	.35	.31	-.11	.61*	-.07	-.08	.02	-.09	-.06	.03
36	.45	.69*	.28	.02	.33	-.01	.12	-.06	-.05	.09	-.05	-.04	-.05
37	.35	.68*	.25	.13	.27	-.11	.07	-.12	.07	.16	-.15	.12	.01
38	.06	.15	.59*	.10	.25	-.27	.37	.06	-.01	-.08	-.13	-.04	-.01
39	.24	-.24	-.44	.18	-.12	-.18	.12	.49*	.01	.00	-.20	-.23	.32
40	.32	.41	.68*	.02	.04	.08	.01	.03	.13	.21	.11	.05	-.11
41	-.17	.93*	.05	-.10	.08	-.15	.04	-.05	-.01	.03	.04	.02	.03
42	.83*	.05	.19	.06	-.09	-.07	-.11	-.02	.05	.00	.04	.07	.09
43	.78*	.03	.18	.13	-.02	.01	.03	.01	.09	.06	.03	.13	.06

TABLE 11 (Cont'd.).

IND	1	2	3	4	5	6	7	8	9	10	11	12	13
44	.74*	.08	.17	.14	-.06	.06	.06	.03	.20	-.02	-.03	.04	.07
45	.78*	.01	.06	-.09	.22	.19	.20	-.00	-.17	.16	-.01	.10	.06
46	.79*	.05	.02	.02	.09	.09	.11	-.14	-.20	.17	.07	.02	-.05
47	.21	.11	-.31	.17	.61*	-.09	.20	.35	.11	.22	-.04	.12	.07
48	.25	.38	.22	.15	.54*	-.03	-.07	-.19	.27	.22	.16	.11	.12
49	.10	.01	.18	.08	.25	.17	.08	.62*	.15	-.07	-.12	-.00	-.11
50	.51*	.07	-.17	-.21	-.40	.02	.27	.17	-.02	-.01	-.15	-.11	.32
51	.38	.66*	.07	-.07	.20	.15	-.00	.26	.14	.02	.00	-.08	-.09
52	-.00	.25	.11	.12	.10	-.01	.70*	.16	.05	.13	.25	.14	.15
53	.29	.06	.61*	-.31	.13	.05	.02	.15	.01	-.00	.09	-.14	.28
Eigenvalues:													
	10.30	5.52	4.93	3.21	2.85	2.68	1.97	1.65	1.57	1.43	1.26	1.11	1.05

TABLE 11 (Cont'd.).

IND	1	2	3	4	5	6	7	8	9	10	11	12	13
Percentage of variance:													
	19.4	10.4	9.3	6.1	5.4	5.1	3.7	3.1	3.0	2.7	2.4	2.1	2.0

Note: *Marks highest loading for each individual.

thirteen individual difference factors are necessary to describe the peer data set.

Turning now to the reduction of ${}_{j}B_{j}$ based on the peer data, we obtain a result similar to that observed in the focal person data. Only one eigenvector with an eigenvalue greater than 1.00 emerges when ${}_{j}B_{j}$ is factored. This vector explains 64.9% of the variance among the situations and its unrotated principal component is reported in Table 12. Its corresponding eigenvector may be found in Appendix D, Table D.5. Similar to our observation regarding situational differences in the focal person data, we have again found only a single situational factor is necessary to describe the variance among situations in the peer data set.

Finally, factoring ${}_{k}C_{k}$ from the peer's responses results in a solution that requires four factors to explain 75% of the variance that exists between the behavioral response items. The four rotated principal components that emerged are reported in Table 13. These varimax rotated, principal components' eigenvectors are reported in Table D.6. of Appendix D.

Moving now to the interpretation of these results from the peers' reports of focal person leadership behavior, we will again use the three-mode analysis' resultant core matrix to aid our understanding of the interrelationships in the data. This ${}_{m}G_{(pq)}$ for the peer data is reported in Table 14. Similar to the results of the focal person three-mode analysis, the single situation factor in the data indicates that positing a contingency theory to describe the peers' perceptions of their focal person's behavior is probably unnecessary. However, the core will again be helpful in understanding the behavioral differences that exist between the individual difference factors.

TABLE 12. Principal Component of Situations

Peer Sample

Situation	Unrotated Principal Component
1	.81
2	.82
3	.79
4	.85
5	.82
6	.81
7	.77
8	.83
9	.74
10	.81
Eigenvalue	6.49

TABLE 13. Varimax Rotated Principal Components of Behavioral Responses

Peer Sample

Behavorial Response	Rotated Principal Components 1	2	3	4
1	.08	-.05	.91*	.12
2	.39	.26	.72*	.02
3	.80*	-.06	.02	.20
4	.84*	.16	.16	.04
5	.84*	.18	.20	-.04
6	.27	.01	-.02	.85*
7	.15	.89*	-.00	.17
8	-.11	.37	.24	.70*
9	.10	.90*	.12	.07
10	.48*	.37	.32	.20
Eigenvalues:	3.76	1.59	1.12	1.03
Percentage of variance:	37.6	15.9	11.2	10.3

Note: *Marks highest loading for each behavioral response item.

TABLE 14. Untransformed Core Matrix $m^{G}(pq)$

Peer Sample

Individual Factor	Behavior Factor 1	Behavior Factor 2	Behavior Factor 3	Behavior Factor 4
1	.65 (240.62)	1.68 (-10.47)	1.88 (-6.11)	2.48 (-12.43)
2	-.03 (55.95)	-2.22 (-20.33)	-.91 (-10.05)	1.83 (4.66)
3	-.00 (-5.27)	-1.54 (-9.58)	2.07 (13.48)	-.74 (-3.41)
4	-.05 (22.53)	.13 (-.87)	-.49 (-4.93)	-.47 (-5.89)
5	-.14 (45.31)	-.25 (-6.55)	-.50 (-7.92)	-.50 (-10.60)
6	-.17 (-6.33)	-.44 (-3.59)	.10 (.67)	-.25 (-1.22)
7	.01 (11.76)	.03 (-.82)	-.11 (-1.40)	-.27 (-2.89)
8	.01 (48.55)	.12 (-3.92)	-.16 (-5.01)	-.30 (-8.32)
9	-.04 (-1.32)	-.10 (-1.04)	.09 (1.32)	-.04 (-.18)

TABLE 14 (Cont'd.)

Individual Factor	Behavior Factor 1	Behavior Factor 2	Behavior Factor 3	Behavior Factor 4
10	-.03 (11.71)	.03 (-.01)	-.04 (-.88)	.04 (-1.48)
11	.02 (18.42)	-.06 (-2.44)	-.01 (-1.57)	.12 (-1.44)
12	-.02 (4.82)	.06 (-.16)	-.10 (-1.15)	-.01 (-.53)
13	.01 (18.33)	-.08 (-2.24)	.08 (-1.217)	-.05 (-2.14)

Considering the behavioral response clusters in the peer sample we find that although they fail to conform to the a priori structure of Johnson's items, the resulting factored solution is interpretable on a content basis. Factor 1 appears to be related to establishing formal role relationships in the work group. The items that load highest on this factor involve the behaviors of making sure subordinates understand the leader's role in the group, maintaining performance standards, letting subordinates know what is expected of them, and expressing appreciation for a job well done. The second factor appears to be a sociability dimension since the two behaviors loading here are making subordinates feel at ease when talking to them and being friendly and easily approached. Different from either of these two factors is the third dimension which might be labeled work facilitation since it includes the behaviors of scheduling work and providing materials necessary for subordinates to do their job. The final factor that emerges will be considered a concern factor since it involves behaviors that may indicate some empathy for the subordinates' situations. These behaviors are helping new members adjust to their work group, and looking out for subordinates' personal welfare. Thus it appears that the peers perceive four kinds of leader behavior: maintaining role relationships, sociability, work facilitation, and concern or empathy.

Given these behavioral factors, we can begin to interpret the individual difference factors that emerged in the peer data. Again, only the core resulting from the use of a standardized ${}_{i}X_{(jk)}$ will be discussed.

The first individual difference factor of Table 14 has a positive orientation toward all four behavioral dimensions but is not related

to all four equally. Its strongest association is with the concern factor and its weakest relationship is with the role relationships factor. The work facilitation and sociability orientations are in between these extremes and are rather similar. Although such an interpretation seems meaningful, the consistent positive relationships in this individual factor may be indicative of "mutual admiration societies" among the focal people and their peers. Since this is the sample in which most of the overlap with the focal person group appeared, it may be that these data are affected by general tendencies toward halo that transcend individual halo which is removed in the standardization of ${}_{i}X_{(jk)}$. That is, there may be a tendency to rate all peers in a favorable fashion. Regardless of whether this factor is a rating factor or a real perception factor, it is one way in which peers describe other leaders. Other such descriptions follow.

The second individual difference factor is characterized by a slight negative orientation toward establishing roles, a strong negative relationship toward sociability and a less marked negative relationship toward work facilitation. However, like the first group, this group is identified by a strong positive concern for the welfare of subordinates. This seems to be a concerned leader group whose actions are not always perceived by their peers as being socially appropriate.

Opposite this second individual dimension is the third group which is marked by a strong positive work facilitation orientation and a negative relationship toward concern, while being similarly oriented to roles and sociability when compared to the second group.

The fourth individual difference factor is marked by only one positive orientation (sociability) and even that relationship is weak.

Its other three orientations are marginally negative (role relationships) or moderately negative (work facilitation and concern). Perhaps these leaders would be labeled by their peers as rather friendly but without other strong tendencies as a leader.

The fifth and sixth individual differences factors appear to be behaviorally similar to the fourth dimension except that both have a negative sociability orientation, and Factor 6 does exhibit some slight positive orientation toward work facilitation. For the remaining 7 individual factors comments similar to those made regarding the focal person data apply here. Characteristically, the ensuing orientations maintain unique patterns within factors but the relationships are so small as to make differences in interpretation minute at best. Therefore, the reader is allowed the option of continuing the interpretation but he/she must understand the weak nature of any interpretated relationships.

Subordinate Sample. Continuing now with the three-mode factor analysis of the subordinate data, we find that upon reduction to characteristic roots and vectors, the ${}_{i}A_{i}$ matrix generated from this data set yields 13 eigenvectors with eigenvalues greater than 1.00. These vectors are reported in Appendix D, Table D.7. Taken collectively, these vectors explain 76.1% of the total variance among the subordinates' individual reports of their leaders' behaviors. The corresponding principal components are reported in Table 15 as they appeared after varimax rotation. As in the peer sample it appears we have arrived at thirteen factor solution for the individual difference factors.

With regard to the analysis of matrix ${}_{j}B_{j}$, we again find only one eigenvector with an eigenvalue greater than 1.00. This is the same result that has ensued from the analysis of each of the three different

TABLE 15. Varimax Rotated Principal Components of Individuals

Subordinate Sample

IND	1	2	3	4	5	6	7	8	9	10	11	12	13
1	.08	-.20	.28	.01	.16	.09	.10	.05	.75*	.09	-.02	-.01	-.06
2	.02	.06	-.04	.33	.19	.12	.17	.58*	.11	-.05	-.26	.19	-.04
3	-.16	.03	.12	.15	.07	-.03	.68*	.21	.11	-.06	.03	.19	.28
4	-.02	.03	.81*	.16	-.17	-.13	.12	-.07	.02	.23	.08	.07	-.11
5	-.02	-.21	.30	.74*	.23	-.11	.20	.05	-.00	-.04	-.00	.14	-.02
6	.23	-.19	.37*	.22	.18	.06	.21	.36	-.08	-.01	-.07	.36	-.09
7	.25	.20	.12	.69*	.03	.06	.33	.05	-.08	.04	-.00	.30	.13
8	-.08	-.50	-.05	-.58*	-.06	.28	.21	.02	.02	-.11	.17	.18	.07
9	.14	.27	-.46*	.09	.19	.08	-.34	.27	.12	-.04	.12	.44	.11
10	.17	.01	-.09	.11	.72*	.16	-.12	.05	-.10	.17	-.13	-.06	-.03
11	.21	.35	-.12	-.03	-.15	.01	.08	-.08	.58*	-.06	.03	.22	.03
12	.10	-.22	-.02	-.10	-.24	-.14	-.00	.70*	-.03	.17	.23	.29	.02
13	.63*	.41	-.13	.07	.16	-.17	.03	-.07	-.27	-.08	.10	-.12	.04
14	.65*	-.19	-.20	.02	.03	.13	.07	.03	.10	.06	.10	.22	.09

TABLE 15 (Cont'd.)

IND	1	2	3	4	5	6	7	8	9	10	11	12	13
15	.74*	-.28	.06	.34	.02	-.05	-.01	.15	.05	.16	.05	.21	-.04
16	-.05	.68*	-.22	-.00	.17	-.34	-.06	-.14	.05	-.15	.07	-.14	.14
17	.60*	.30	.22	.12	-.24	-.03	-.07	.20	.00	.18	.00	.09	.06
18	.35	.67*	-.34	-.02	.14	-.09	.10	-.25	-.13	-.06	.04	-.23	-.15
19	.53*	-.08	.10	.38	.42	-.20	-.19	.17	.24	-.03	-.04	-.15	.13
20	.37	.09	-.13	.01	-.27	.21	.60*	.07	.16	-.15	-.02	-.07	-.13
21	-.03	-.20	.09	.13	.23	.15	-.30	-.15	.22	-.35*	-.33	-.12	.24
22	-.10	-.09	-.12	-.18	.04	.66*	.11	-.03	.10	.06	.11	-.03	.08
23	.39	.04	.79*	.04	.07	.04	-.14	.03	.05	.00	.07	-.00	-.05
24	.08	.06	.01	.01	.75*	-.18	.08	.04	.17	-.22	.16	.08	.02
25	.02	.81*	.20	-.10	-.02	.03	.14	-.07	.23	.10	-.05	-.06	-.09
26	.64*	.18	-.30	.32	-.00	.15	.01	-.01	-.26	.07	-.14	-.06	-.12
27	-.20	-.42	.32	.06	-.17	.24	.29	.13	.20	.29	.07	.43*	.06
28	.84*	.09	.26	-.16	.06	-.13	-.02	-.06	.14	-.11	-.05	-.13	-.02
29	.16	-.05	.08	-.11	.06	.09	.01	-.06	-.04	-.02	.86*	.01	-.01

TABLE 15 (Cont'd.).

IND	1	2	3	4	5	6	7	8	9	10	11	12	13
30	.13	.79*	-.10	.09	-.18	-.08	.04	-.29	-.08	.14	-.11	-.04	-.04
31	-.08	-.54*	.32	.39	-.14	.11	.01	.38	.07	.13	-.06	.35	.11
32	-.03	-.43	.09	.29	.06	-.08	.02	.24	-.08	.19	-.01	.64*	-.02
33	.85*	.15	.02	-.15	.13	-.07	.02	.02	.21	-.15	.13	-.16	-.01
34	.26	.51*	.06	.49	-.22	.15	-.04	.24	.17	-.04	.08	.13	.16
35	.61*	-.10	-.15	.08	.45	-.18	-.05	.01	-.14	-.11	.10	.07	-.07
36	.26	-.23	.36	-.10	.17	.02	.08	.55*	-.02	-.14	-.15	.28	.14
37	.10	-.01	-.24	.51*	-.17	.37	-.33	.08	.05	-.03	.11	.38	.07
38	-.23	.69*	-.35	.30	.05	.16	-.03	.04	-.26	.12	.05	-.02	.04
39	.92*	.12	.08	.10	.01	-.03	.05	-.10	-.05	.07	-.03	.02	-.09
40	-.04	-.22	-.01	.09	.07	.19	.10	.74*	-.00	-.08	.04	.04	.12
41	.12	-.13	.12	.23	.25	.15	-.19	.34*	-.14	-.16	.03	.40	.03
42	.67*	-.03	-.26	.29	-.16	.13	.01	.16	-.04	.15	.11	.14	.12
43	.47	-.25	.08	-.04	.12	-.02	.11	.22	-.16	.11	-.09	.54*	-.09
44	.39	.03	.03	.33	-.00	.10	-.08	.15	.26	-.07	.50*	.10	-.10

TABLE 15 (Cont'd.).

IND	1	2	3	4	5	6	7	8	9	10	11	12	13
45	-.15	-.24	.71*	.29	.00	-.06	-.06	.07	.08	-.16	.08	.09	.14
46	-.04	-.04	-.01	.08	-.01	.10	.09	.12	-.04	.10	-.05	.07	.88*
47	-.02	-.05	.20	.22	-.16	.08	.12	.17	.17	.01	.08	.76*	.12
48	-.11	-.08	.03	.16	-.20	.65*	-.09	.37	-.09	.07	-.07	.03	-.01
49	-.03	.10	.49	.59*	.14	.11	-.10	.08	-.06	.13	-.18	.24	.14
50	-.06	-.01	.11	.25	.18	.57*	.03	.05	.13	-.32	.09	.42	.14
51	-.00	.05	.10	.06	-.02	.04	-.10	-.06	.06	.85*	-.04	.05	.11
52	.89*	.08	.06	-.16	.14	-.07	-.06	-.01	.14	-.12	.14	-.10	-.07
53	-.21	-.39	.71*	-.01	-.03	.03	.15	.15	.21	.02	-.04	.23	.07
Eigenvalues:	9.18	8.66	4.44	3.72	2.90	2.24	1.75	1.51	1.40	1.28	1.16	1.09	1.00
Percentage of variance:	17.3	16.3	8.4	7.0	5.5	4.2	3.3	2.9	2.6	2.4	2.2	2.1	1.9

Note: *Marks the highest loading for each individual.

data sets. In this case, this one factor accounts for 74% of the variance in situations as reported by these subordinates. The unrotated principal component that results from this solution is reported in Table 16. The corresponding eigenvector of this solution is in Appendix D, Table D.8.

For ${}_kC_k$, we find the following results. Reduction of this matrix to its characteristic roots and vectors produced two vectors with eigenvalues greater than 1.00. (See Appendix D, Table D.9.). This solution accounts for 64.5% of the total variance in behavioral responses as reported by these subordinates. The corresponding varimax rotated principal components are reported in Table 17. Thus, we have a two-factor solution.

Keeping these results in mind we can now proceed with the interpretation of the third core matrix of this research, that being the one derived from the three-mode analysis of the subordinate data. As in both of the preceding core matrices, the presence of only one situational factor precludes the examination of the situation x behavioral response interaction so we will primarily use the core to interpret behavioral differences among the individual difference factors. The obtained matrix is reported in Table 18.

Before interpreting the individual difference factors, let us consider the interpretation of the behavioral factors. Unlike the other two data sets, factoring the behavioral response items in the subordinate sample produced only two factors. This is precisely the number intended when Johnson's scales were chosen to measure the two leadership behavior dimensions: consideration and initiating structure. Indeed, when we consider the content of the variables that have their highest loadings on each resultant response factor in this data set, we find

TABLE 16. Principal Component of Situations

Subordinate Sample

Situation	Unrotated Principal Component
1	.85
2	.85
3	.89
4	.90
5	.87
6	.86
7	.84
8	.88
9	.84
10	.81
Eigenvalue	7.40

TABLE 17. Factor Structure of Behavioral Responses

Subordinate Sample

Behavioral Response	Rotated Principal Components 1	2
1	.03	.59*
2	.31	.75*
3	.21	.77*
4	.14	.85*
5	.25	.80*
6	.80*	.29
7	.89*	.13
8	.61*	.33
9	.89*	.07
10	.74*	.16
Eigenvalues:	4.69	1.76
Percentage of variance:	46.9	17.6

Note: *Marks the highest loading for each behavioral response item.

TABLE 18. Untransformed Core Matrix $m^{G}(pq)$

Subordinate Sample

Individual Factor	Behavior Factor 1	Behavior Factor 2
1	.08 (202.20)	2.55 (26.21)
2	.43 (115.29)	-2.70 (-11.8)
3	-.13 (43.92)	-.84 (-3.11)
4	-.05 (-26.75)	.49 (2.11)
5	.10 (25.29)	.12 (2.10)
6	.04 (89.87)	-.10 (3.20)
7	.03 (19.14)	.04 (-.59)
8	.03 (-12.62)	.03 (-.85)
9	-.01 (-12.18)	-.01 (-2.00)
10	.02 (-8.50)	-.06 (-1.87)
11	-.00 (79.57)	-.08 (3.19)
12	-.00 (43.70)	.01 (1.52)
13	.01 (8.19)	-.04 (1.06)

that the items divide themselves exactly as the a priori structure hypothesized. In this subordinate sample we have behavioral dimensions of consideration as our first factor and initiating structure as our second factor. The reader should note that such a result is consistent with Johnson's development of the scales using subordinate samples. Because of this two-factor result, it will be impossible for 13 individual difference factors to exhibit uniquely patterned relationships with these two variables. There simply are not enough possible combinations available. Therefore, interpretation of the latter rows of this core must be approached with even greater care than was exercised in the other two data sets.

Individual Factor 1 seems to be almost a purely initiating structure dimension. While having only a marginal positive relationship with the consideration factor, this individual difference factor has a strong positive relationship with the initiating structure dimension. Leaders in this group are evaluated by subordinates as only slightly considerate with a reportedly strong emphasis on initiating structure.

Contrasted with this is the second individual difference factor which demonstrates a moderate positive relationship with consideration and a strong negative orientation toward initiating structure. In this case, leaders probably do not initiate structure very much at all, but this is not balanced by a proportionally high consideration orientation. Based on this result, it seems that subordinates do not perceive these two dimensions to be the opposite of one another. This is a reasonable result given that the two dimensions are orthogonal and not negatively correlated.

Individual difference factors 3 and 4 seem to be rather similar to each other in their consideration orientation while differing with respect to initiating structure relationship. Factor 3 has a moderate negative initiating structure relationship and a low negative consideration orientation, while factor 4 has a moderate positive initiating structure orientation. Thus, while neither group is perceived as considerate, one is moderately oriented toward initiating structure while the other is not. As noted above, these results complete our interpretation of the subordinates' core matrix.

Based on the foregoing discussions, we can make a few summary statements about the results of the three separate three-mode analyses. However, such summary statements would come from a purely subjective evaluation of these results which have taken some twelve tables (plus Appendices) and several pages of text to describe in detail. Rather than provide such a subjective summary, the methods section of this paper has operationalized an analysis technique which allows us to compare on an empirical basis the results of these three different analyses. This technique is the one credited earlier to Golding and Seidman and described as a means of testing the similarity of the factor structures in each of the modes of the analysis across the three samples. It is to the results and discussion of such Golding and Seidman analyses that we now turn our attention.

Golding and Seidman Analyses

Individual Factor Structures. Let us first consider the comparability of the individual difference factor structures that resulted from the separate three-mode analyses. The reader will recall that the Golding and Seidman technique is a means of looking at a multitrait-multimethod matrix to assess the convergence of traits across methods of measurement.

In the present case, the three respondent groups constitute three methods of measurement, while the individual difference factors resulting from the analysis of each data set define the traits. Factor scores were computed for the observations in each data set for its resultant factors and these scores were intercorrelated across the three methods of measurement. A multitrait-multimethod matrix was then available for submission to the final stage of the Golding and Seidman technique which determines the principal components of this multitrait-multimethod matrix. Such a final varimax rotated principal component solution for the individual difference factors is reported in Table 19. Note that the factors resulting from the various three-mode analyses define rows in the matrix which are labeled by the following abbreviations: FP for focal person, P for peer, and S for subordinate. The fourteen principal components with eigenvalues greater than 1.00 from the multitrait-multimethod matrix consitute the columns. These components account for 80.2% of the variance among individual difference factors from the three analyses and they will be referred to as F1 to F14 in the following discussions.

Examination of Table 19 reveals a rather consistent pattern in the results. With the exception of F2 and F9, the first 10 principal components are each characterized by three of the original variables. That is, eight of the first 10 components each have only three variables with their highest loading on a given factor. Note that these three loadings on each of the components come from each of the three original data sets. This indicates that there are at least eight instances in which a factor from one respondent group is paralleled by the measurement of a factor in each of the other two data sets. There is convergence within at least eight different factors from each of the three separate data sets.

TABLE 19. Golding & Seidman Analysis

Varimax Rotated Principal Components of Individual Factors

Individual Factors	Convergent Factors													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FP1	.95*	-.11	-.10	-.10	.02	-.09	-.03	.03	.12	-.06	.08	.07	.10	.04
FP2	.24	.57*	.43	.05	-.02	.09	.01	-.15	-.49	.16	-.22	.10	-.13	-.10
FP3	.05	-.21	.72*	.31	.16	.03	-.02	-.07	.20	-.09	.30	-.25	-.15	.11
FP4	.01	.60*	-.15	.07	.45	-.11	.32	.16	.40	.02	.11	-.12	-.02	.03
FP5	.05	-.11	.03	-.02	-.38	.27	.71*	-.11	.06	.18	.04	.02	-.11	-.03
FP6	.04	-.06	.11	-.11	-.02	.04	.18	.80*	.18	.05	.15	-.05	.05	-.11
FP7	.02	-.10	-.14	.80*	.03	-.14	.10	-.08	-.01	.03	-.07	.31	.14	-.07
FP8	.05	-.37	-.04	-.11	.59*	-.03	.28	.05	-.40	.05	-.24	-.10	-.22	.05
FP9	.12	.01	-.31	.29	.02	.67*	-.14	.00	-.01	-.07	-.04	-.33	-.23	-.08
FP10	-.00	.04	-.03	.09	-.04	.11	.08	-.06	-.20	.07	.10	-.16	.46	.63*
FP11	-.05	-.07	.02	-.10	.15	.29	-.12	.09	.07	.55*	.30	.37	.03	.05
P1	-.09	-.00	.02	.91*	-.08	.03	-.04	.08	.13	-.03	.13	-.09	.08	.12
P2	.96*	.10	-.04	.09	-.01	.12	.07	.02	-.04	-.01	-.03	-.05	-.03	-.04
P3	.11	-.90*	.17	.04	.04	-.01	.21	.03	-.05	.08	.08	.04	-.08	.00

TABLE 19 (Cont'd.).

Individual Factors	Convergent Factors													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
P4	-.01	.17	.87*	-.00	-.15	.07	.08	.14	-.00	-.00	-.02	.03	-.11	.01
P5	.02	.17	.16	.10	.86*	-.00	.09	-.10	-.05	.06	-.05	-.04	.08	.01
P6	-.14	.01	-.14	.03	-.04	.80*	.23	.09	.03	.01	-.09	.08	.04	.02
P7	.02	.12	-.01	-.02	.09	.06	.04	-.03	.04	-.00	.79*	.05	-.17	-.06
P8	.03	-.01	-.01	-.06	.08	-.13	.02	-.05	.86*	.05	-.07	.04	.00	-.04
P9	-.04	.08	-.00	-.02	-.01	-.22	.73*	.19	-.06	-.10	.07	.08	.20	-.05
P10	.04	-.08	-.09	-.11	.16	-.00	-.15	.77*	.08	-.08	.05	.02	.26	.08
P11	.04	.01	.03	-.12	.02	-.03	-.01	.06	.01	.00	-.03	-.01	-.13	.76*
P12	-.01	.08	-.06	.03	.01	-.02	.14	.11	-.01	.83*	-.02	.02	-.08	.12
P13	.06	.08	-.02	.07	-.03	-.03	-.08	.01	-.01	-.02	.06	.84*	.03	-.05
S1	.98*	-.03	.08	-.04	.03	-.08	-.02	.02	-.05	.03	-.02	.03	-.02	.05
S2	.02	.93*	.13	-.06	.05	-.03	.07	-.11	-.07	.06	.14	.13	.01	.04
S3	.10	.12	-.85*	.13	-.10	.33	.01	.06	.08	.06	.07	-.02	-.11	.02
S4	.04	.06	.17	.74*	.18	.22	-.07	.04	-.24	.04	-.00	-.11	-.18	-.20

TABLE 19 (Cont'd.)

Individual Factors	Convergent Factors													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
S5	.00	-.04	-.12	-.02	.77*	-.08	-.21	.08	.16	-.04	.11	.06	.02	-.05
S6	-.00	.01	.22	.10	-.14	.21	.13	.39*	.35	.34	-.22	.15	-.10	-.02
S7	-.06	-.02	-.14	-.17	.15	-.10	.25	.33	-.52*	.24	-.26	.35	-.13	.04
S8	-.01	-.12	.04	.14	-.17	-.19	.15	.31	-.18	.07	.70*	.01	.15	.11
S9	.05	-.05	-.08	.06	.06	.04	.05	.23	.07	.02	-.11	.09	.82*	-.03
S10	.04	-.06	.17	-.15	-.13	.67*	-.10	-.15	-.31	-.02	.09	-.02	.19	.01
S11	.01	.05	.06	-.04	.05	.17	.10	.36	.03	-.68*	.01	.21	-.21	.14
S12	.04	-.10	.09	.03	.27	.18	.70*	-.04	.02	.05	.07	-.31	-.05	.15
S13	-.04	-.04	.02	.41	-.05	-.05	.01	-.21	.13	.08	-.04	.40	.06	.50*
Eigenvalues:														
	2.96	2.90	2.82	2.71	2.66	2.56	2.36	2.01	1.85	1.59	1.57	1.41	1.23	1.04

TABLE 19 (Cont'd.).

Individual Factors	Convergent Factors													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Percent of variance:	8.0	7.8	7.6	7.3	7.2	6.9	6.4	5.4	5.0	4.3	4.2	3.8	3.3	2.8

Note: *Marks the highest loading for each individual.

Regarding the two exceptions to this finding in the factor structure, we should recognize that F2 deviates from the general trend by indicating convergence among four, rather than three, original factors. Two factors from the focal person data converge on this factor along with one dimension from each of the other two data sets. Thus, we still find convergence across the three data sets in a ninth instance; the only problem with this case of convergence being somewhat non-distinct focal person factors. Alternately, in the case of F9 we find only two of the original variables loading highest on this factor. Convergence across the three original data sets is somewhat more dubious. But such convergence is not completely unrecognizable since one focal person factor does have a strong, but not its highest, loading on F9.

The remaining four principal components show convergence in the peer and subordinate data sets in one case (F11), factors that do not show convergence across any analyses in two cases (F12, and F13), and convergence across the three respondent groups on the final principal component, F14. The results on these latter factors indicate that there are two factors in the three original analyses that are unique to a specific analysis. These are the thirteenth peer factor and the ninth subordinate factor. Both of these factors have already been passed over as being rather unacceptable for interpretation purposes. Thus, in general it appears that there is a fair amount of similarity in the empirical factor structures regarding individual differences in the three original analyses.

A final relevant question regarding this similarity of individual difference factors involves the content of these similar factors. Since only three factors in the focal person data set were considered amenable to interpretation, we are limited in discussing the content of convergent

factors by this number. Only the first three principal components in this Golding and Seidman analysis will lend themselves to interpretation.

Considering the variables that load highest on F1, we find FP1, P2 and S1. Returning to our earlier interpretations of these dimensions we recall that both F1 and S1 are individual difference factors with fairly strong loadings on initiating structure with minimal or even negative consideration orientations. However, P2 did not exhibit a strong work facilitation orientation. Rather it seems that the characteristic of this factor that causes it to converge on this first principal component is a strong negative sociability orientation. This element is probably correlating with the negative consideration orientation of FP1. Thus, our first convergent factor appears to be an initiating structure, nonconsiderate orientation toward leadership.

Turning to F2, we find FP2, FP4, P3 and S2 having their highest loading on this component. Note that FP4 has the stronger relationship to this component of the two focal person factors. FP2, FP4 and S2 are all characterized by a low or negative orientation toward initiating structure coupled with varying degrees of consideration. Since P3 has a negative loading on F2, it seems that the strong work facilitation-orientation of P3 coupled with its negative consideration and sociability tendencies cause its negative relationship to F2. Lack of structure coupled with ill-defined consideration mark the positive aspect of this factor. Thus, we again have some content basis for arguing for convergence.

In relation to F3, FP3, P4 and S3 have their highest loading on this component FP3 and P4 demonstrate a positive consideration and sociability orientation while S3 has a negative consideration tendency. A negative loading for S3 and positive loadings for FP3 and P4 on F3 can be

directly explained on the basis of a consideration type of convergent component.

Given the preceding discussion of the Golding and Seidman test of factor reproducibility across the three original analyses, one is led to conclude that there are both empirical and content bases on which to argue for similarity among the individual difference factor structures of the three analyses. Let us now turn our attention to the comparisons of the factor structures from the other two analysis modes, situations and behavioral responses.

Situation Factor Structures. In comparing the results of the analyses of the situation mode of the three data sets we are not confronted with as large a task as that discussed in the immediately preceding analysis. Here, the reader will recall, all three original analyses produced a single situation factor and thus our task is simply one of comparing three factors. Use of the Golding and Seidman technique in this case produced a single final principal component with an eigenvalue greater than 1.00 which explained 51.7% of the variance in the situation factors coming from the three data sets. This component is reported in Table 20. Interpretation of this component is difficult beyond the point of noting that the three situational factors do tend to converge, but that convergence does not seem to be as strong as was true of some of the individual difference factors reported in the preceding analysis. We have a case of a single situational factor being the most reliable explanation of situational variance in all three data sets and this situation factor seems to be somewhat similarly composed across all three analyses.

Given the rather unclear explanation of the relationships that these loadings provide, the reader may also find it instructive to consider

TABLE 20. Golding & Seidman Analysis

Unrotated Principal Component of Situation Factors

Situation Factor	Convergent Factor
FP1	.74
P1	.70
S1	.71
Eigenvalue:	1.55
Percentage of variance:	51.7

the correlations actually observed between these three original factors. (See Table 21) The reader should immediately recognize, upon examination of this table, the reason why this convergent factor explains so little of the variance among these three original factors. The correlations between the factors never exceed .30. Thus, the Golding and Seidman analysis has revealed a lower level of convergence in these situational factors than was true of the individual factors.

TABLE 21. Correlations Between Situation Factors from Three Respondent Groups

	FP1	P1	S1
FP1	1.00000		
P1	.28771	1.00000	
S1	.29342	.24391	1.00000

Behavioral Response Factor Structures. Turning now to the final mode in each of the three analyses, we must compare the factor structures derived from the behavioral response items in these analyses. Again, the Golding and Seidman technique was employed as the basis of this comparison. This analysis resulted in the derivation of four principal components with eigenvalues greater than 1.00 from the multitrait-multimethod matrix which employed behavioral response factors from the three original analyses as traits. These four components explained 59.9% of the variance in these response factors. The varimax rotation of these components is reported in Table 22.

Inspection of Table 22 reveals a patterning of high loadings analogous to that of Table 19 which presented the results of the Golding

TABLE 22. Golding & Seidman Analysis

Rotated Principal Components of Behavioral Response Factors

Behavioral Response Factors	1	2	3	4
FP1	.08	.72*	-.02	.26
FP2	.62*	-.08	.04	.35
FP3	-.22	-.07	.73*	.24
P1	-.01	.72*	-.12	-.01
P2	.05	.09	.03	.86*
P3	.25	.05	.73*	-.16
P4	.63*	.10	-.28	-.16
S1	.79*	-.02	.18	.02
S2	-.10	.60*	.34	-.29
Eigenvalues:	1.570	1.451	1.286	1.080
Percentage of variance:	17.4	16.1	14.3	12.0

Note: *Marks highest loading for each original factor.

and Seidman analysis of individual difference factors. In the present case, the first two principal components are marked by high variable loadings for three variables each. In both cases the three variables come from the three separate original analyses. In the case of F3, we find only two variables with their highest loading on this factor, while F4 has only one variable loading on it. It appears that there is empirical convergence across the three analyses on two factors. We also have evidence of convergence across the focal person and peer analyses for one factor and a single unique factor emerges only from the peer analysis. Note, however, that the factor loadings indicating convergence in this matrix are somewhat lower than those observed in relation to convergent individual difference factors. Therefore, convergence of the behavioral response factors may not be as strong.

Considering the content of the converging factors we find the following. F1 is characterized by FP2, P4 and S1. The reader will recall that FP2 and S1 were relatively clear consideration factors corresponding quite closely to their hypothesized a priori structure. The reader will also remember that P4 was labeled a concern or empathy factor. Content indicates, then, that F1 is defined by similar measures of the consideration dimension.

Similar content support is found in relation to F2 which appears to be an initiating structure dimension. Here FP1, P1, and S2 all exhibit high loadings. Recall that FP1 and S2 were almost pure initiating structure dimensions defined by several items from Johnson's initiating structure scale, while P1 used three of these items to define a formal role orientation. Thus, from all three analyses the behaviors related to structuring certain aspects of the work setting converge on this component.

Since the subordinate sample only produced two behavioral response factors, convergence based on this sample's factors cannot extend beyond two principal components. However, each of the other analyses produced at least one more factor and we continue to observe convergence between these additional factors as we consider F3. In this case the focal persons' scheduling work factor is comparable to the peers' work facilitation factor which, the reader will remember, also includes providing working materials. Thus, this type work facilitation factor from these items does not appear to be completely idiosyncratic to one sample.

Opposite this third result is the unique nature of the peers' sociability factor. Because the focal people and subordinates did not make major distinctions between consideration and being sociable, this latter construct emerges as being unique to the peer sample and thus exhibits no convergence.

Generally, then, we can conclude that two of the behavioral response factors are consistent across the three data sets and there is some support for the validity of this aspect of the focal persons' three-mode analysis. We have already seen similar support in relation to the other two modes of the analysis.

Based on these consistencies in the results of the three separate three-mode analyses, one might be quick to draw conclusions regarding this research's implications for contingency theories of leadership. This might be especially true given the consistent finding of a single situational factor which seems to preclude any contingency theory in all three data sets. However, the reader is cautioned against such hasty decisions until some other pertinent issues are given consideration. One such issue is the strong-trait versus strong-situation orientation

that contingency theories differ on. It has been stated earlier in this paper that this difference is a primary one among competing contingency theories, and given the results of the present study which have been discussed up to this point, some readers may be inclined to immediately conclude that a strong-trait theory is clearly more appropriate. However, let us consider some additional data before attempting to address this issue in a final manner.

Stanley's ANOVA of Multitrait-Multimethod Matrices

The reader will recall that in an earlier portion of this paper it was noted that the Fiedler versus Vroom and Yetton, strong-trait versus strong-situation controversy, would be addressed by means of analyzing multitrait-multimethod matrices. It was argued that situations and behavioral responses could be used as methods and traits, respectively, and that analysis of such a matrix would indicate which variable accounted for more of the variance in the entire matrix. Reports of three such analyses based on the respondent group's separate data sets follow.

In order to understand these analyses, the reader may first find it useful to consider the data that go into them. To test the effect labeled subjects, one uses the average correlation in the entire multitrait-multimethod matrix. Thus, the first effect tested is the general level of agreement over all the ratees on the entire set of rated traits. The test of subjects x traits employs the difference between the average validity diagonal value and the average level of correlation in the entire matrix. This tests the significance of individual differences in regard to the traits rated. Finally, the subject x situation effect is tested using the difference between the average monomethod correlation and the average correlation in the entire matrix.

As such, it examines any effects due to idiosyncracies in situations that are not reproduced elsewhere in the matrix. Thus, we have tests for differences in general response levels, individual differences or traits and situational effects.

The results of the first analysis based on the multitrait-multimethod matrix derived from the focal person data are reported in Table 23. Note that differences in level of responses, individual differences in relationship to the behavioral responses and situational differences all have significant effects on the responses of these focal people. However, the proportion of total variance column on the far right indicates that the items account for the largest percentage of the variance while situations account for the smallest percentage. This finding in regard to the behavioral response items is consistent with our previous results that speak in favor of a strong-trait theory of leadership. However, the significant situational effect should call our attention to the fact that differences in situations are affecting the responses made by the focal people. This implies that the mean level of an individual's response pattern tends to vary across the situations but that these variations do not significantly alter the pattern of that individual's responses. An individual who reports a stronger orientation toward initiating structure in one situation will tend to use initiating structure kinds of behaviors more frequently than consideration behaviors in other situations. Thus, the frequency of using any or all behaviors may change significantly across situations since certain situations may have demands that take more precedence over some leader behaviors. This finding must moderate any conclusions that might be made regarding the strong trait-strong situation controversy.

TABLE 23. Stanley's ANOVA

Focal Person Sample

Source	SS	df	MS	F	VAR	C-G[a]
Subjects	1025.55	52	19.7221	52.8318*	.1935	.782
Subjects X Items	2237.66	468	4.7813	12.8082*	.4408	.977
Subjects X Situations	464.28	468	.9921	2.6576*	.0619	.561
Subjects X Items X Situations	1572.51	4212	.3733		.3733	.874

*p<.001

[a]C-G Refers to Cronbach's coefficient of generalizability discussed earlier in this paper.

In the last column of Table 23 the reader will find Cronbach's coefficient of generalizability as calculated for each of the effects. While not providing a different evaluation of the data, these values do point up the consistency of some of the effects observed in the rest of the ANOVA results. Note the high generalizability index for the trait effect. As explained early in this paper, it seems especially meaningful, given this result, to generalize across a universe of situations based on an individual's behavior in the situations presently studied. Alternately, the low coefficient of generalizability for the situation effect indicates an inability to consistently generalize across a universe of people based on situational effects. These results indicate that the trait effects observed in this study should consistently generalize to other studies of a similar sort, while the situational effects will be less consistent in their generalizability.

Results of similar analyses on the peer and subordinate data sets are reported in Tables 24 and 25, respectively. As the reader can see, these findings are similar to those observed in the focal person data set. We again find a significant, but small, effect due to situations that could easily be overlooked in a hurried effort to put down the generic contingency hypothesis. As noted earlier a strong-trait orientation is, however, still supported by these results.

Except for their inability to explain the interrelationships among the factor structures of the three modes of each analysis, these last three tables provide a fairly complete summary of virtually all of the findings of the present research. They not only illustrate the strong trait effect that was observed in the data, but collectively they also point up the consistent nature of the study's findings across all three data sets. However, they still point up differences in the three

TABLE 24. Stanley's ANOVA

Peer Sample

Source	SS	df	MS	F	VAR	C-G[a]
Subjects	1420.40	52	27.3154	79.3360*	.2697	.848
Subjects X Items	1956.23	468	4.1800	12.1406*	.3836	.962
Subjects X Situations	473.29	468	1.0113	2.9373*	.0667	.587
Subjects X Items X Situations	1450.08	4212	.3443		.3443	.873

*p<.001

[a]C-G Refers to Cronbach's coefficient of generalizability discussed earlier in this paper.

TABLE 25. Stanley's ANOVA

Subordinate Sample

Source	SS	df	MS	F	VAR	C-G[a]
Subjects	2044.74	52	39.3219	151.1218*	.3906	.854
Subjects X Items	1820.02	468	3.8889	14.9458*	.3629	.905
Subjects X Situations	339.20	468	.7248	2.7855*	.0465	.400
Subjects X Items X Situations	1096.04	4212	.2602		.2602	.843

*p<.001

[a]C-G Refers to Cronbach's coefficient of generalizability discussed earlier in this paper.

response sets. Note that for the subordinate sample, there is a stronger effect due to general response level than was noted in either of the other samples and that this effect seems to come from a reduction in the comparative level of error variance. Thus, the trait and situational effects remain in about the same proportion while differences in response level seem to remove more of the error variance.

Besides the strong trait-strong situation issue discussed above, there is at least one other factor the reader should bear in mind when trying to draw conclusions based on the results of this study. This concerns the issue of method bias. While the consistency of results across the three data sets may be due to consistent perceptions among the subjects in the three respondent groups, it is possible that such similarities are instead a function of the data collection technique. In the case of finding only a single situation factor, it may be that the situation statements presented on the questionnaires are, in fact, not representative of all the various leadership situations that really exist. The present questionnaire may have only tapped one type of situation from this domain. Or alternatively, it may have touched on several types of situations but not stated them in an explicit enough manner for subjects to perceive any major differences between these situations. A third possible method factor that may have resulted in the patterning of responses across the situations was the presentation of the behavioral response items in the same sequential order for each situation. While any of these factors may have operated singly or in conjunction with one of the other possible biases, it is argued here that such effects are probably not a major causative factor in the outcomes of the present research.

Because such method biases have systematic and reliable effects on the data, re-examination of the empirical data generated from the study can do little to resolve this issue regarding the impact of method bias. We must look for other data on which to base such arguments.

Regarding the first issue of not tapping a wide enough range of leadership situations, the reader is reminded of the a priori considerations that went into the construction of this aspect of the questionnaire. Situations were selected to cover as wide a range as possible and yet be realistic in several kinds of organizations. To the extent that the reader agrees this goal was met, this should alleviate concerns about this type of bias. In another vein, some anecdotal data that became available during the course of the study also speak to this issue. Particularly in the focal person sample, respondents voluntarily told the researcher upon completion of their questionnaire that the situations seemed realistic and that they involved many of the issues these leaders had been forced to deal with in recent months. Therefore, it is argued that while there may be some unrepresentativeness in the sample of situations, this factor is probably not large enough to completely obviate the present results.

This same anecdotal data speaks to the concern regarding the strength of the manipulation provided by the situations as they were stated on the questionnaire. While it might be possible to increase the stimulus provided by the manipulations and thereby achieve stronger situational effects, such changes may produce other problems in the data such as destroying the reported real-world aspects of the data collection technique. Similarly, the finding of significant situational effects in the Stanley ANOVA technique indicates that the respondents

did perceive some differences in the situations that prompted them to report changes in levels of behavior. Again the supplementary information that is available argues against major method effects due to problems in the research technique.

In the third potential case of method bias, the sequencing of the items, a primary issue is one of disinterest and boredom. If the respondent tired of the task, he/she may have developed patterned responses to hasten the completion of the questionnaire. Again, anecdotal data voluntarily provided by subjects in all three data sets would argue against such disinterest and patterning of responses. Several subjects expressed their interest in the measuring device and, as in the focal person sample, they reported appreciating the real-world orientation of the instrument. Thus it appears that in the three instances where method bias could be the cause of the present results, anecdotal information obtained from the subjects, as well as some empirical data, would argue against such effects. This should not imply that the researcher considers method bias to be completely absent in the present results. Rather, the argument is made that the effects of such biases are not large enough to substantially affect the conclusions drawn from the present data set. It seems unlikely that if all the method bias were removed from the data, major reversals in the results would occur. What seems most likely is that situational effects would become somewhat stronger.

Given these cautions and additional remarks regarding generalizations based on the present data set, we will now summarize the results of the research effort and draw conclusions based on the summary.

SUMMARY AND CONCLUSIONS

While many authors have advocated the use of contingency theories as either descriptive or normative models of leadership behavior, the early portions of this discussion have shown that the empirical bases for such arguments may not have been explored carefully enough to warrant such reasoning. It was pointed out that such theories assume an interaction between a leader's style of behavior and the situation the leader finds him/herself in. It was then argued that the simple discovery or lack thereof, of interactions between these two factors is not sufficient grounds to argue for or against such theories. Rather, it was suggested that the demonstration of an adequate empirical base requires the identification of clusters of similarly behaving individuals in different types of leadership situations. Only after such clusterings of people, behaviors and situations are found, can one conclude that there is a reasonable basis for contingency arguments.

The present research was aimed at the identification of such clusterings based on the description of the behavior of fifty-three leaders from four different organizations in a variety of different situations. Descriptions of each leader in the study were provided by three different people: the leader, a peer, and a subordinate. All three people completed a questionnaire on which they reported the leader's use of ten behaviors in each of ten leadership situations. To identify the clusterings noted above, three-mode factor analysis was used to analyze the three data sets which resulted from the three types

of people who described each leader's behaviors. Once the data sets were separately analyzed, various multitrait-multimethod matrices and analysis techniques were used to compare the results obtained from the three different respondent groups and to explore the finer points of each data set. A summary of these results is presented below along with those conclusions that seem reasonable.

Analysis of the leaders' self-report data regarding their behavior in these ten situations resulted in an initial finding of a rather large number of individual differences among the leaders in the sample. Eleven subject factors were derived based on these fifty-three people. Similarly, three different behavioral response factors emerged, indicating three classes of leader behavior as reported by these leaders or focal people under study. These dimensions of leader behavior were labeled initiating structure, consideration, and scheduling work. Contrary to the demands of contingency theories, however, only one cluster of leadership situations emerged from the analysis. It seems that these leaders did not perceive major differences among the leadership situations, at least in relation to such differences' effects on their reported behavior.

Because of the lack of situation clusters, the individual differences in leader behavior were only interpreted once. Based on the three-mode factor analytic solution, it was concluded that at least three of these individual difference factors could be interpreted. These were identified as an initiating structure, non-considerate type of leader that was not concerned with scheduling work; a considerate, non-initiating structure type that scheduled work for subordinates; and a considerate, non-initiating structure, non-work scheduling type of leader.

Similar results emerged in relation to the large number of individual factors and the situation factor when the peer data was analyzed. In this case there were thirteen individual difference factors and only one situation factor. However, in relation to the behavior factors, the results indicated four dimensions of leader behavior. These were behaviors related to establishing formal role relationships, sociability, work facilitation, and concern or empathy for subordinates.

As in the case of the leaders' self-report data, these behavioral dimensions were used to interpret some of the individual difference factors based on a three-mode analysis which involved only one situation factor. The first individual difference type of leader defined by this analysis was characterized as engaging in all four categories of behaviors but being most closely associated to the concern or empathy factor. The second group exhibited a similar concern orientation but appeared less heavily engaged in the other three behaviors, while the third group exhibited an opposite pattern of little concern coupled with a strong positive work facilitation tendency. The fourth type of leader appeared to be somewhat sociable but not heavily inclined to perform any one of the other three types of behavior. In fact, this group might be said to avoid the work facilitation and concern dimensions. The fifth and sixth types of leaders where characterized as being like the fourth type except that both have negative sociability orientations while the sixth group does exhibit some tendency toward work facilitation.

Finally, the subordinates' data were similarly analyzed and the following results were observed. There were thirteen individual difference factors as in the peer's data, a single situation factor,

and two leadership behavior dimensions which were labeled consideration and initiating structure. Interpreting the first four individual difference factors based on their characteristic behaviors as revealed by a three-mode analysis, we find the first type of leader marked almost purely by initiating structure behaviors. The second group was characterized by an almost complete avoidance of initiating structure coupled with a slightly positive orientation toward consideration. Individual difference groups three and four in the sample both have slightly negative orientations toward consideration, and group three has a stronger negative orientation toward initiating structure while group four has a positive orientation toward such structure.

Given these factor analytic solutions of the three data sets, the research used the Golding and Seidman technique of analyzing multi-trait-multimethod matrices to compare the three sets of results. In this study, such matrices were composed using the three respondent groups as methods and the factor structure obtained for one of the three analysis modes (individuals, situations, or behavioral responses) as the traits measured under the methods. In the case of the individual difference factors from the three analyses, at least 9 factors were found to be similarly composed across the three data sets. However, only three of these were interpretable. The first such convergent factor across the three analyses was labeled an initiating structure, non-considerate type of leader; the second, a type of leader characterized by a lack of initiating structure and a similar lack of consideration. Finally, the third factor was defined as a considerate type of leader with few initiating structure tendencies.

Regarding the situational factor structure, all three analyses produced only one factor. When these single factors were compared across analyses, they were shown to be rather similar.

For the final analysis mode, behavioral responses, factor solutions of three, four and two factors were compared. Here only two factors emerged as similar across the three analyses. These were the consideration and initiating structure dimensions. Thus, it appears that for the behavior dimensions as well as for the individual and situational dimensions there is a fair degree of convergence across the three analyses.

Finally, an ANOVA decomposition of a multitrait-multimethod matrix, employing situations as methods and items as traits for each of the data sets, was performed to assess the strength of the behavioral response and situational effects on the responses of a given group. These analyses supported the previous results by highlighting a strong behavioral response effect. However, they also called attention to the fact that situations were affecting mean levels of responses. Thus, the one factor situational solution's interpretation demands caution.

Based on all of these results, certain conclusions can be drawn in relation to research on various aspects of leadership behavior. The literature review presented earlier pointed out at least three such issues which now deserve comment. These are the strength of previous findings regarding leadership behavior, the appropriateness of multivariate clustering techniques as a means of exploring contingency theories about such behaviors, and the apparent strength of contingency theories as indicated by the present research.

The literature reviewed earlier indicated that there are two primary dimensions of leader behavior which have been reported in several

studies. This result is again supported, to some extent, by the present research. Two behavioral response factors converged across all three data sets. However, another characteristic of the present data should not be overlooked. This is the presence of other dimensions identified in the focal person and peer samples. In particular, the finding of four dimensions in the peers' data may indicate that finer discriminations are being made among leader behaviors as described by peers than by either of the other groups. This finding may help explain the higher validities obtained when peer ratings are used as predictors of leaders' success (e.g., Schmidt & Johnson, 1973) compared to other predictors. If peers are able to reliably identify more dimensions of leader behavior than other groups, they should naturally introduce more variance into predictive systems such as ratings, thus allowing for higher validities. Thus, while the present study has yielded findings similar to much of the previous leadership behavior research, there is an additional aspect of the data that may better explain the process of measuring leaders' behavior, and using such measures in prediction research.

Turning now to the usefulness of the present analysis techniques as a means of exploring three-way interactions, it seems reasonable to conclude that these techniques are amenable to the present research problem. As Golding suggested, three-mode analysis was capable of identifying the various subclusters of people, situations, and behavioral responses. It also clarified the relationships between these clusters. Finally, the clusters were shown to be reproducible by the Golding and Seidman analysis which identified convergent factors across all three samples. The techniques accomplished their intended purpose in allowing us to examine contingency theories and, therefore, it is

concluded that their use in the study of other interactionist notions should be considered as a potential aide to researchers interested in such multivariate analyses.

Given these methodological conclusions let us go on now to the major conclusions derived from this research regarding contingency theories and their usefulness in the study of leadership.

Taking into account the discussion of method bias presented in the results section, the present data indicate that true contingency theories, stated in terms of interactions between leadership styles and situational effects, are probably unnecessarily complex as general descriptive models of leader behavior. To the extent that one can generalize from the present sample of fifty-three leaders, the consistency of this study's findings across all three respondent groups indicates that leaders' behavior across situations tends to take the form of patterned responses, the mean level of which is affected by situational differences. That is, for the leaders in this sample, there is a tendency to maintain a consistent orientation toward initiating structure and consideration behaviors across situations. What changes due to situational effects is the frequency with which these behaviors are emitted.

Regarding this conclusion, which is based primarily on the lack of situation clusters, one might argue that other researchers have demonstrated situational effects which are in excess of those related to behavioral response tendencies or traits. Indeed, the Vroom and Yetton research which has been repeatedly cited in earlier discussions is such a case in point. One might ask how the present conclusion can be reconciled with such contradictory results. While differences in measurement methods may account for many of the discrepancies, it is

the present researcher's position that another factor contributing to the contradiction is a difference in leader samples. Vroom and Yetton's data come from leaders who are committed to attending a seminar on the affects of situations on leaders' behavior. Most of these samples come from leaders or other people who are about to undergo training in the contingency model. Whether such leaders are naive regarding these models may be irrelevant. The simple fact that such leaders are prepared, and for the most part willing, to experience leadership training regarding situational effects may make them a more homogeneous group than that employed in the present study. Certainly, if one could select such a homogeneous group and subject their behavior to situational manipulation, the results of the present study would similarly predict a stronger situational effect relative to individual differences effects. Thus, while the present results favor the strong-trait position of Fiedler, they may not be completely inconsistent with the strong-situational views of Vroom and Yetton.

A similar conclusion which seems reasonable given the present study is that leadership training with regard to leadership styles which does not consider strong-trait effects on leader behavior can be expected to fail. The leadership training literature is replete with studies in which training has had little effect on leaders' behavior when they return to their job. The indication is that the situational manipulation of the training context is usually not carried over into the work setting and thus its ability to change leader behavior is lost. Such a finding is consistent with the present results in that most situations do not seem to have strong enough effects on leader behaviors except to change their mean level of occurrence. If the strength of a situational manipulation of the training context is not carried over

into the work setting, its ability to change leader behavior will probably be lost. Thus, the maintenance of a situational manipulation of a strength equal to that of a training session is necessary to maintain changes in leaders' behavior patterns. If this is not accomplished, the trait effect seems strong enough to cause old behavior patterns to reemerge after training. In summary then, it may be more useful to develop managers' behavior patterns in situations equal to those of their job. As is the trend in many companies, managers should be grown within the system; not given a three-to-five-day off-site experience that is intended to turn them into "super man-"agers overnight. The usefulness of long term development in relation to major style changes seems accented by the present research. Note, that this conclusion is only drawn in relation to style training, not skills training.

However, while this major conclusion indicates a preference for long-term development of leaders' styles of behavior, there may still be some place for short-term managerial training in relation to leadership styles. The usefulness of such efforts is indicated by the situational main effect observed in the present data. It has been noted earlier that such a main effect indicates a change in the mean level of behavioral response patterns across situation. This implies a certain kind of flexibility in leadership behavior that could be capitalized upon in training situations. It seems that if one could identify the level of response on each of the two style dimensions which is related to effectiveness in a given situation, such information could be used to increase leadership effectiveness through training. That is, the flexibility indicated by a situational main effect might allow leaders to learn to adjust their response level within the confines of their

more general behavioral response pattern, and thus be more effective in a given situation. While such short-term leadership training will probably not produce major reversals in a leader's behavior pattern, it may serve to help leaders use what flexibility they have in their managerial style to develop more appropriate response levels in various situations.

A final conclusion that seems appropriate given the results of the present study is that contingency theories, while not descriptive, have not been ruled out as being useful in other areas. Vroom and Yetton's model,for example, may well explain the ideal in managerial behavior and as such it should not be discarded. Rather, it seems that expectations regarding peoples' abilities to behave consistently in relation to such models should be tempered by the findings of studies such as the present one. Similarly, training may have to be more longitudinally oriented. The usefulness of contingency theories seems more in the realm of ideal prescriptions rather than something that has been denied by the results of this research or other studies like it.

This last conclusion intimates that further research in the area of contingency theories seems necessary. Such an intimation is exactly correct. The first such studies that should be done could take one of two forms: a replication of the present effort on a larger, more representative sample to test the generalizability of this study's results; or, a replication of the present study on the same sample after six months or a year's time. While the first of these would test this study's generalizability, the second would test the stability of these results over time and thus give an estimate of the endurance of trait effects. Given the frequently reported high test-retest reliabilities of the

LBDQ, it is hypothesized that a fair amount of stability would reveal itself in a study of this latter type.

Another area in which further but similar contingency research might be done is in relation to the issue of leadership effectiveness. The present study only described leaders' behavior, but if a researcher could obtain measures of leaders' effectiveness in several situations and then look at the situation x behavioral response relationship within groups of leaders who are rather similar on the effectiveness measure, more support for contingency theories might be found. In some ways, such research might also test the hypothesis regarding homogeneous groups of individuals that was put forth in relation to Vroom and Yetton's results in an earlier part of these conclusions.

A final area in which research seems necessary is in developing a metric for leadership situations. While some authors have provided taxonomies of situations, it seems advisable that research begin to explore the possibility of measuring leadership situations on something more than a nominal scale. The development of such scales should also contribute to a better understanding of the differences between this study's results and those efforts which demonstrate conflicting results.

In summary, the present study has shown that for a sample of fifty-three leaders, contingency theories are overly-complex descriptions of their behavior. Rather, a simple main effect model which takes into account a strong trait and a weak, but significant situational effect on the enactment of leader behavior may provide a better description of their behavior. However, such a conclusion does not imply that research on the usefulness of contingency theories should stop. Rather, the appropriateness of a prescriptive contingency model in longitudinal

training efforts may still be supportable in light of the present findings, and it is to such research that future efforts should be directed.

APPENDICES

APPENDIX A

FOCAL PERSON QUESTIONNAIRE

1. Name: _____

2. Age: _____

3. Sex: M F

4. Position in Organization: _____

5. Number of organizational levels between you and your company's president _____

6. How long have you had your present position? _____

7. How long have you been a supervisor or manager? _____

8. How many years of eduction have you had beyond the eighth grade? ___

READ THESE INSTRUCTIONS CAREFULLY!

On the following pages you will find descriptions of ten situations. These situations have been selected from many that a leader might face while performing his job. The descriptions of these situations are brief so leaders from different kinds of organizations will be able to use the same questionnaire to describe their behavior in relation to their job. You should use the questionnaire to describe your behavior on your present job.

Complete the questionnaire in the following way. Read a given situation. As you read it, imagine that on an average day in your present job, this situation is the most important concern you have. While you are thinking about how you would handle this situation, consider the behavioral statements listed below the situation. These statements allow you to describe your behavior when faced with this situation. Use the scale provided with each statement when faced with this situation. Use the scale provided with each statement to report how frequently you would perform the specified behavior. The points on this scale are A - Always (I would always perform this behavior while facing this situation); B - Often (I would often perform this behavior while facing this situation); C - Occasionally (I would occasionally perform this behavior while facing this situation); D - Seldom (I would seldom perform this behavior while facing this situation); E - Never (I would never perform this behavior while facing this situation). Simply circle the letter that best describes your behavior. For example, the given situation is:

> Your most pressing need is to decide which of two senior subordinates to send to check on a problem area in another part of your company's operations.

and the behavioral statement is:

> I would expect to help a new subordinate adjust to our work group.

A (B) C D E

The leader in the example reported that given this situation, he/she could be expected to <u>often</u> help a new subordinate adjust to the work group.

Notice that some of the behavioral statements may seem unrelated to a given situation. Respond to these less relevant descriptions as though you had opportunity to perform those behaviors while you are confronting the situation that has been described. However, keep in mind that your primary concern is the stated situation and that dealing with this situation is your first responsibility.

If you have never faced a given situation as it is described, imagine that you have just confronted it for the first time. Describe your behavior as if you were going to deal with this situation based on your present skills.

Some situations may not seem to involve crucial events. This should not concern you. The situations were chosen from many a manager might face and, thus, not all of them are life-and-death conditions. Respond to these less demanding situations as though they are the most difficult problem you have to face on a given day.

Remember, the object of this questionnaire is to allow you to describe your behavior in various situations. Do not report what you think is ideal behavior. Rather report what you think you would really do in each situation.

Please go on now to complete the questionnaire.

Situation 1: Your most pressing need is to fire a subordinate who is clearly incompetent.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 2: Your most pressing need is to markedly improve the quality of your work group's output in the next 30 days.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinates does a good job.	A	B	C	D	E

Situation 3: Your most pressing need is to deal with a single complaint that comes from more than 50% of your subordinates

		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 4: Your most pressing need is to convince your subordinates that a recently received change in organizational policy is necessary and reasonable. You agree with the change.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinates does a good job.	A	B	C	D	E

Situation 5: Your most pressing need is to demonstrate the competence of your work group to your immediate boss.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinates does a good job.	A	B	C	D	E

Situation 6: Your most pressing need is to negotiate a compromise over a conflict in priorities between your work group and another group whose activities directly control your group's ability to accomplish its tasks.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 7: Your most pressing need is to submit a 6-month budget for your department within the next week.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 8: Your most pressing need is to decide whether or not your work group will accept an extra heavy work load. If your don't accept, your boss will give the work and any rewards to another group.

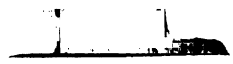
		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 9: Your most pressing need is to have your group handle an emergency change in its work schedule for today.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 10: Your most pressing need is to resolve a major conflict between two members of your work group.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect to schedule the work for my subordinates.	A	B	C	D	E
2.	I would expect to see to it that my subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect to make sure my subordinates understand my role in the group.	A	B	C	D	E
4.	I would expect to maintain definite performance standards for my subordinates.	A	B	C	D	E
5.	I would expect to let my subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect to help a new member adjust to my group of subordinates.	A	B	C	D	E
7.	I would expect to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect to look out for my subordinates' personal welfare.	A	B	C	D	E
9.	I would expect to be friendly and easily approached.	A	B	C	D	E
10.	I would expect to express appreciation when a subordinate does a good job.	A	B	C	D	E



APPENDIX B

PEER AND SUBORDINATE QUESTIONNAIRE

On the following pages you will find descriptions of ten situations. These situations have been selected from many that a leader might face while performing his job. The descriptions of these situations are brief so leaders from different kinds of organizations will be able to use the same questionnaire to describe their behavior in relation to their job. You should use this questionnaire to describe _____ and his/her behavior as a leader in your organization as you perceive it.

Complete the questionnaire in the following way. Read a given situation. As you read it, imagine that on an average day in your organization, this situation is the most important concern _____ has. While you are thinking about how he/she would handle this situation, consider the behavior statements listed below the situation. These statements allow you to describe _____'s behavior as you perceive it when he/she is faced with this kind of a situation. Use the scale provided with each statement to report how frequently _____ would perform the specified behavior. The points on this scale are A - Always (He/She would always perform this behavior while facing this situation); B - Often (He/She would often perform this behavior while facing this situation); C - Occasionally (He/She would occasionally perform this behavior while facing this situation); D - Seldom (He/She would seldom perform this behavior while facing this situation); E - Never (He/She would never perform this behavior while facing this situation). Simply circle the letter that describes his/her behavior. For example, the given situation is:

> His/Her most pressing need is to decide which of two senior subordinates to send to check on a problem area in another part of your company's operation.

and the behavioral statement is:

> I would expect him/her to help a new subordinate adjust to our work group.

A (B) C D E

The person in the example reported that a leader he/she knew, when given this situation, could be expected to <u>often</u> help a new subordinate adjust to the work group.

Notice that some of the behavioral statements may seem unrelated to a given situation. Respond to these less relevant descriptions as though _____ had opportunity to perform those behaviors while he/she is confronting the situation that has been described. However, keep in mind that your primary concern is the stated situation and that dealing with this situation is _____'s first responsibility.

If you have never observed _____ facing a given situation as it is described, imagine that he/she has just confronted it for the first time. Describe his/her behavior as if he/she was going to deal with this situation based on his/her present skills.

Some situations may not seem to involve crucial events. This should not concern you. The situations were chosen from many a manager might face and, thus, not all of them are life-and-death conditions. Respond to these less demanding situations as though they are the most difficult problems_____ has to face on a given day.

Remember, the object of this questionnaire is to allow you to describe _____'s behavior in various situations. Do not report what you think is ideal behavior. Rather, report what you think _____ would really do in each situation.

Please go on now to complete the questionnaire.

Situation 1: His/Her most pressing need is to fire a subordinate who is clearly incompetent.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2.	I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4.	I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5.	I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7.	I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9.	I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10.	I would expect him/her to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 2: His/Her most pressing need is to markedly improve the quality of his/her work group's output or service in the next 30 days.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2.	I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4.	I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5.	I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7.	I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9.	I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10.	I would expect him/her to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 3: His/Her most pressing need is to deal with a single complaint that comes from more than 50% of his/her subordinates.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2.	I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4.	I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5.	I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7.	I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9.	I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10.	I would expect him/her to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 4: His/Her most pressing need is to convince his/her subordinates that a recently received change in organizational policy is necessary and reasonable. He/she agrees with the change.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2.	I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4.	I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5.	I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7.	I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9.	I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10.	I would expect him/her to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 5: His/Her most pressing need is to demonstrate the competence of his/her work group to his/her immediate boss.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2.	I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4.	I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5.	I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7.	I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9.	I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10.	I would expect him/her to express appreciation when a subordinates does a good job.	A	B	C	D	E

Situation 6: His/Her most pressing need is to negotiate a compromise between his/her work group and another group whose activities directly control his/her group's ability to accomplish its tasks.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2.	I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4.	I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5.	I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7.	I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9.	I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10.	I would expect him/her to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 7: His/Her most pressing need is to submit a 6-month budget for his/her department within the next week.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2.	I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4.	I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5.	I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7.	I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9.	I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10.	I would expect him/her to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 8: His/Her most pressing need is to decide whether or not his/her work group will accept an extra heavy work load. If he/she does not accept, his/her boss will give the work and any rewards to another group.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2.	I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4.	I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5.	I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7.	I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9.	I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10.	I would expect him/her to express appreciation when a subordinates does a good job.	A	B	C	D	E

Situation 9: His/Her most pressing need is to have his/her work group handle an emergency change in its work schedule for today.

		Always	Often	Occasionally	Seldom	Never
1.	I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2.	I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3.	I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4.	I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5.	I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6.	I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7.	I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8.	I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9.	I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10.	I would expect him/her to express appreciation when a subordinate does a good job.	A	B	C	D	E

Situation 10: His/Her most pressing need is to resolve a major conflict between two members of his/her work group.

	Always	Often	Occasionally	Seldom	Never
1. I would expect him/her to schedule the work for his/her subordinates.	A	B	C	D	E
2. I would expect him/her to see to it that his/her subordinates have the materials they need to work with.	A	B	C	D	E
3. I would expect him/her to make sure his/her subordinates understand his/her role in the group.	A	B	C	D	E
4. I would expect him/her to maintain definite performance standards for his/her subordinates.	A	B	C	D	E
5. I would expect him/her to let his/her subordinates know what is expected of them.	A	B	C	D	E
6. I would expect him/her to help a new member adjust to his/her group of subordinates.	A	B	C	D	E
7. I would expect him/her to make subordinates feel at ease when talking with them.	A	B	C	D	E
8. I would expect him/her to look out for his/her subordinates' personal welfare.	A	B	C	D	E
9. I would expect him/her to be friendly and easily approached.	A	B	C	D	E
10. I would expect him/her to express appreciation when a subordinate does a good job.	A	B	C	D	E

APPENDIX C

FEEDBACK LETTERS

Dear Respondent:

Earlier this summer, you took part in a study on leader behavior. A researcher from Michigan State University asked you to complete a questionnaire describing the behavior of a leader in your organization. Because the purpose of the study was to describe leadership behavior in several situations, the questionnaire you completed required that you describe this leader's behavior in ten different situations. This study is now complete and this letter will explain its results to you.

Fifty-three leaders from four different organizations agreed to participate in the study. Forty were males and 13 were females. Their average age was 38 and they had an average of 6.2 years of experience as a manager. These leaders reported being from 1 to 7 levels removed from the chief administrator of their organization and they had an average of 3.5 years of education beyond high school.

The four organizations involved in the study were in widely different businesses. One of these organizations is located in the Central Plains states and is involved in the manufacture of specialized agricultural equipment. The second organization is a city government unit while the third is a department within a state governmental system. Both are located in a large midwestern state. The fourth organization was located in the western part of this same midwestern state and it is involved in the manufacture of certain automobile parts. The agricultural equipment manufacturing company and the state governmental unit are much larger organizations than the other two and, therefore, most of the leaders in the study (about 40) came from these two larger groups.

As noted above, this study was concerned with describing leadership behavior in several situations. The exact purpose of the study was to determine whether leaders or subordinates or peers perceived that they changed their leadership style as they faced different kinds of situations. Leadership style is usually measured in relation to two classes of behavior. These are: 1) behaviors related to structuring the work setting (scheduling work, providing materials to work with, letting subordinates know what is expected of them, etc.); and 2) behaviors related to developing good work relations among the members of the work group (being friendly and easily approached, helping new subordinates adjust to the work group, looking out for subordinates'

personal welfare, etc.). Similar measures of style were used in this study. The research then attempted to determine whether leaders could use structure kinds of behaviors in one situation and relations kinds of behaviors in another situation.

To answer the question regarding leadership style changes in relation to differences in situations, leaders and their peers and subordinates were asked to describe the leader's expected behavior in ten situations. These situations varied, you will recall, from having to fire a subordinate, to improving the productivity or quality of a work group's output, to resolving conflicts among subordinates or to handling changes in work scheduling.

The results of the study can be summarized rather briefly by noting that leaders do not report major changes in their style as they go from one situation to another. Peers and subordinates of these leaders also report that the leaders' styles of behavior do not change greatly as the leader faces different situations. However, there are differences in leadership styles among leaders. Some leaders report relying more heavily on structuring kinds of behaviors in all situations while other leaders report using more relations-oriented kinds of behavior in all situations.

In general, three similar kinds of leaders were identified in each of the three different groups (leaders, peers, and subordinates). These were a structuring, non-relations oriented type of leader; a type of leader who does little in terms of either structure or relations; and a relations-oriented type of leader with few structure tendencies. The first type of leader emphasizes structuring kinds of behavior in all situations. Alternately, the second kind of leader does not really emphasize either class of behavior, while the third kind of leader emphasizes relations kinds of behavior in all situations.

Before the reader of this letter jumps to the conclusion that this study has indicated that leaders do not change their style of behavior as they go from one situation to another, a word of caution is in order. Although the study found that leaders do not generally emphasize one class of leader behaviors in one type of situation and the other class of leader behaviors in another type of situation, it did determine that leaders do change the amount of each of these behaviors that they exhibit in different situations. That is, a leader who is structure oriented in his/her behavior will probably exhibit different amounts of structuring behaviors in different situations. However, the amount of structuring behaviors will always be larger than the amount of relations behaviors. A similar principle holds for the relations-oriented leader. Thus, the amount of each class of behavior that a leader exhibits may change, but the relative strength of the two types of behavior will stay fairly constant across all situations.

Given these general results, two questions may still persist in the reader's mind. First, were there differences in these results in the different organizations? While the data do not lend themselves to such comparisons (since the number of leaders used in each organization varies greatly), it appears that no such differences would exist.

The same findings appear to emerge in each of the four organizations. Similarly, the data do not allow conclusions regarding which of the three types of leaders is most prevalent in a given organization, but again such inter-organizational differences appear slight on the surface.

The second question that one should ask in light of these results is, "What do they mean for the leaders in our organization?" Probably the primary conclusion that can be drawn from these data is that leadership training which attempts to change leadership styles in a short period of time seems likely to be of limited value. Leaders exhibit a characteristic style across most situations so training situations would necessarily have to be quite unique and have large effects on leadership styles before such training could override the tendency of leaders to respond with their characteristic style. Thus, results of this study may help explain why so many leaders complain that leadership style training seems to be rather unsuccessful. The study indicates that the situational differences encountered in training programs are not strong enough to continue to influence behavior after leaders leave the training session. Therefore, it appears that long-term training which emphasizes the situational differences encountered by managers may be more successful in developing a different style of leadership in a given leader.

In closing, we would like to thank you and your organization for your participation in this study, and we hope these results will help you better understand why leaders in your organization behave as they do. If you have any further questions regarding the results of this study or their meaning, feel free to send them to Bruce Saari, 5915 Bois Ile Drive, Apt. 86, Haslett, Michigan 48840. A written response to your question will be mailed as soon as possible.

Sincerely,

Bruce B. Saari
Industrial Psychology Interest Group, Michigan State University

Dear Leader:

In addition to the letter discussing the general findings of the study, we promised to give you individual feedback regarding the comparison of your behavior with that of other leaders in the study. On the attached page you will find a graph with three lines on it. These lines are scales on which your score on each of the three leadership types discussed in the general letter is plotted. That is, the first line shows you how closely you are related to the structure oriented, non-relations oriented type of leader. The score on the second line shows how similar you are to the non-structure, non-relations oriented leadership style and the third line contains your score on the relations-oriented, non-structure oriented type of leadership. These scores are based on your own reports of your leadership behavior in the ten situations. Note that a score near the top of a line means that you are very much like this type of leader while a score near the bottom of a scale indicates that you are the opposite of the type of leader described. Scores near 0 mean that you are about average on this scale.

Along with these scale scores, you will also find three numbers reported below the scales. These are measures of agreement between your ratings of yourself compared to your peer and subordinate, and a measure of agreement between your peer and subordinate. These measures of agreement are called correlations and are on a scale from -1.00 to 1.00. A score of 1.00 indicates perfect agreement between the two people while a score of -1.00 indicates that one member of the pair reported high scores while the other reported opposite low scores. Scores near .00 indicate little agreement between the two people in question. In this last case, the scores are said to not correlate at all.

To interpret these scores, you need only consider the following. If you and a peer or subordinate correlate highly (above +.60), there is a fair amount of agreement between your reports of your behavior and and their reports of your behavior. Similarly, strong negative correlations (-.60 or below) indicate that one of you was rating you high on certain behaviors while the other was rating you low. Scores around .00 are hard to interpret since the disagreement between two raters may take several forms. However, such scores do indicate differences in perceptions of your behavior. They do not indicate extremely good or poor ratings by one of the two raters.

Remember, in interpreting your scores, there is no right way to score. Rather, this study has only described your behavior compared to that of other people. It has not concluded which is the best leadership style. However, if after seeing how you rate yourself you decide you would like to be perceived differently, you might begin to think about changing your behaviors to fit the style of leadership you want to use.

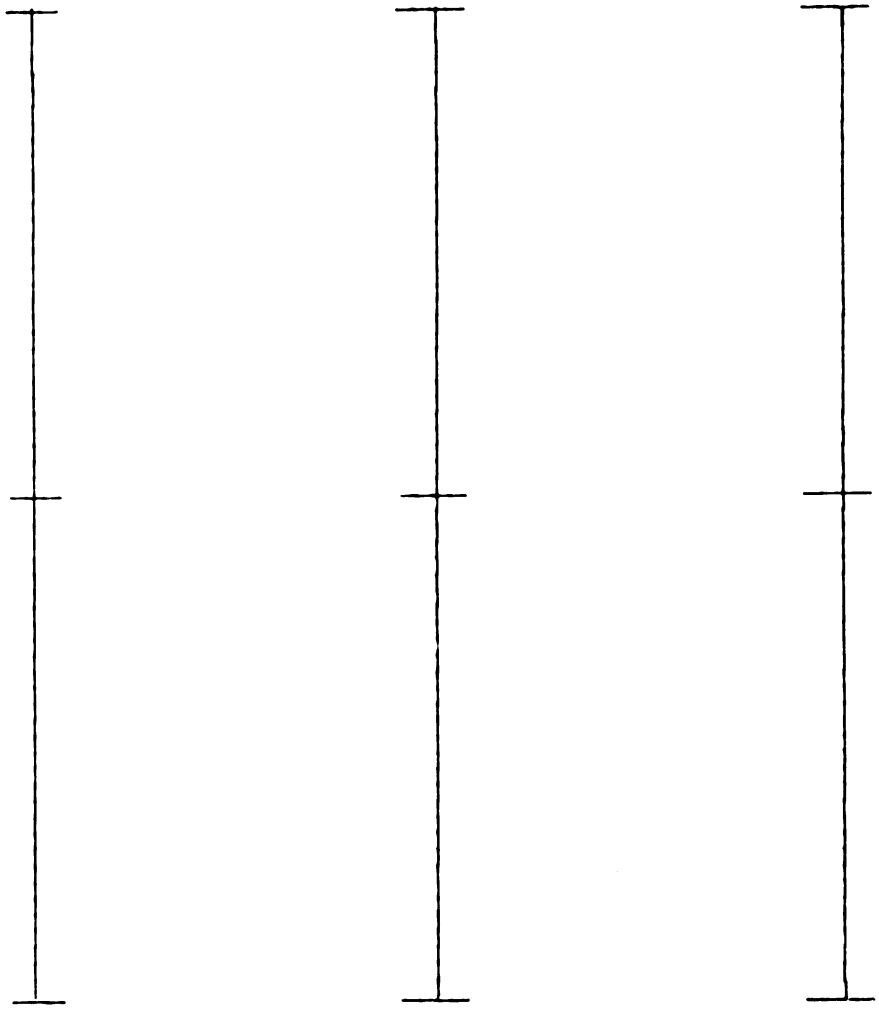
Finally, a special thank you goes along with this letter for your willingness to participate in this study. Without your cooperation, it never would have been completed. I hope these results will help

you better understand your own perceptions of your behavior as a leader. As in the case of the general feedback letter, please feel free to send any questions you might have.

Sincerely,

Bruce B. Saari

STYLE 1 STYLE 2 STYLE 3



Structure Oriented, Non-Relations Oriented

Non-Relations Oriented, Non-Structure Oriented

Relations Oriented, Non-Structure Oriented

CORRELATION BETWEEN LEADER AND PEER REPORTS _____

CORRELATION BETWEEN LEADER AND SUBORDINATE REPORTS _____

CORRELATION BETWEEN PEER AND SUBORDINATE REPORTS _____

APPENDIX D

TABLES OF EIGENVECTORS

TABLE D.1. Eigenvectors of Individuals

Focal Person Sample

	Eigenvectors										
IND	1	2	3	4	5	6	7	8	9	10	11
1	.14	.20	.02	-.02	.13	-.08	-.02	.23	-.02	-.09	.08
2	.07	.12	-.05	.12	.18	-.10	-.04	.18	.29	.13	-.57
3	.19	.01	-.03	.11	.05	-.13	-.21	.06	-.16	-.20	-.17
4	.04	.24	.11	.01	-.01	.19	-.32	-.01	.04	.10	.05
5	.09	.08	.08	-.10	-.27	.36	.00	-.12	.05	-.11	-.20
6	.06	-.16	-.02	.31	.23	.08	.02	.04	-.16	-.02	.03
7	.13	.14	-.03	.03	-.18	.02	-.27	.04	.12	.34	.11
8	.16	-.00	.30	-.10	.06	-.09	.01	.01	.08	-.08	.15
9	.11	.08	.20	.19	.24	.17	.07	-.02	-.11	.03	-.03
10	.11	-.18	-.09	.09	-.03	-.04	.09	-.11	.44	.03	.13
11	.18	-.07	.00	-.08	.01	-.19	-.20	-.02	-.16	.07	-.08
12	.15	-.04	-.22	-.09	.03	.08	-.05	.07	.07	.02	-.17
13	.11	-.04	-.07	.36	.09	.09	.04	.15	.02	.05	.08
14	.20	.04	.21	.04	-.17	-.00	.04	.01	.07	-.03	.01
15	.21	-.07	-.05	-.16	.09	-.04	-.13	-.10	.09	.01	.15

TABLE D.1. (Cont'd.).

	Eigenvectors										
IND	1	2	3	4	5	6	7	8	9	10	11
16	.12	-.22	-.24	-.05	.02	-.05	-.05	.12	.03	-.05	.07
17	.17	.01	-.16	.01	-.04	-.16	.20	-.01	-.03	.28	-.06
18	.19	-.15	.03	-.09	.03	.22	.03	-.09	-.02	-.03	.05
19	.13	.10	.16	-.11	-.02	-.25	-.03	-.04	-.13	-.21	.10
20	.15	-.05	-.05	-.13	.13	.05	-.22	.16	.20	-.04	-.21
21	.18	.08	-.08	-.30	.05	-.14	.01	.09	.03	.03	-.08
22	.14	.02	-.11	-.05	-.23	.13	-.15	.06	-.39	-.03	-.09
23	.20	-.17	.15	.03	-.11	-.14	.03	-.02	.03	-.00	.05
24	.20	-.14	.04	.05	-.09	.13	-.04	-.01	.09	-.24	.00
25	.08	-.12	-.14	-.11	.34	.12	-.16	.04	-.18	.07	-.05
26	.21	-.07	.03	-.08	-.03	-.16	.06	.08	.01	.06	.02
27	-.02	.22	.01	-.20	.16	.14	-.06	.22	.05	-.02	.27
28	.12	.13	.05	.15	-.06	.07	-.17	.14	.09	.26	.19
29	.05	.23	.04	-.00	.24	.05	-.01	-.30	-.23	.24	-.00
30	-.04	.16	-.22	-.12	-.17	-.07	.02	.34	-.01	-.09	.02
31	.08	.19	-.11	-.07	-.12	.09	.27	.01	-.18	-.15	-.03
32	-.02	.28	-.17	.05	-.02	-.03	-.00	.13	.03	.01	.20
33	.15	-.02	-.21	.12	.01	.29	-.02	-.14	.03	.01	.18
34	.16	-.04	-.08	.09	-.11	.01	.18	.24	-.35	.08	-.01
35	.16	.02	.03	.26	-.18	-.15	-.19	.01	.02	.11	-.01
36	.15	-.00	.01	.12	-.13	.21	-.03	.19	.04	-.40	-.05
37	.18	.13	.00	-.01	-.07	.09	-.10	-.13	.07	-.10	.17
38	.08	.20	-.25	-.20	.05	.09	.08	-.19	.00	-.01	-.00

TABLE D.1. (Cont'd.).

IND	Eigenvectors										
	1	2	3	4	5	6	7	8	9	10	11
39	.16	.16	-.00	-.02	-.17	-.09	.21	.02	-.00	.03	-.06
40	-.01	-.07	-.24	.13	.04	-.31	-.00	.02	-.02	-.10	.33
41	.17	.12	.03	.03	.00	-.11	.30	-.09	-.01	.06	.00
42	.07	.18	-.08	.16	.11	-.20	-.15	-.29	.02	-.23	-.15
43	-.00	.20	.06	.12	-.01	.02	.19	.19	.23	-.10	.05
44	.20	-.06	.13	-.08	.09	.09	.09	.02	.03	.14	.08
45	.08	.21	.10	.03	.14	-.05	.16	.12	-.08	.06	-.04
46	.06	.21	-.10	.15	.06	-.19	-.12	-.24	.01	-.32	.02
47	.08	.01	.01	-.02	.40	.13	.22	.12	.13	-.18	.03
48	.22	.09	.01	-.07	.02	.02	.04	-.17	.08	.06	.02
49	.09	-.07	-.23	.33	-.05	.09	.06	.00	-.06	.04	.00
50	.04	.15	-.29	.07	-.05	.06	.17	-.27	.11	.04	-.08
51	.21	-.11	.09	-.05	.15	-.05	.04	-.04	-.12	.01	.07
52	.18	-.13	.18	.00	-.12	-.02	.17	-.08	.03	.07	-.14
53	-.09	.20	.28	.22	-.02	-.02	-.04	.04	-.05	-.01	-.05

TABLE D.2. Eigenvector of Situations

Focal Person Sample

Situation	Eigenvector
1	.32
2	.30
3	.32
4	.33
5	.34
6	.33
7	.30
8	.33
9	.27
10	.31

TABLE D.3. Eigenvectors of Behavioral Responses

Focal Person Sample

Behavioral Responses	Eigenvectors		
	1	2	3
1	.09	.32	.68
2	.33	.29	.16
3	.34	.31	-.27
4	.35	.31	-.08
5	.37	.37	-.20
6	.33	-.20	-.35
7	.34	-.45	.15
8	.30	-.25	-.10
9	.36	-.42	.11
10	.27	-.13	.48

TABLE D.4. Eigenvectors of Individuals

Peer Sample

IND	Eigenvectors												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1	.05	.05	-.18	.04	.10	.26	.18	-.17	-.25	.19	.18	-.11	.21
2	.11	.15	-.05	.12	.03	.21	.06	-.03	-.15	.03	-.12	-.12	-.48
3	.14	-.09	-.15	-.10	.09	.05	-.20	-.22	.11	.14	-.09	-.02	.14
4	.20	-.04	.07	-.10	.17	.07	.05	.03	.08	-.07	.28	.04	.04
5	-.00	.16	.09	.10	.33	.06	.19	.03	-.14	-.08	.02	.27	-.14
6	.19	-.18	-.04	.01	-.09	.01	-.14	.06	-.11	.12	.05	.04	-.20
7	.10	.13	-.04	.01	.07	.38	-.05	-.10	-.08	.-06	-.13	.35	.02
8	.10	-.33	.01	-.01	.02	-.07	.06	.12	-.01	.02	.01	.05	-.05
9	.11	-.01	-.06	-.27	.25	-.01	.05	-.01	.13	.17	.04	.13	-.17
10	.13	.03	.15	.07	.22	-.02	-.12	.00	-.07	.08	-.30	-.16	-.19
11	.09	-.02	-.10	.20	.10	.08	.04	.19	.32	.24	.19	-.27	.01
12	.18	-.10	-.15	.06	.00	-.03	.24	-.13	.04	.07	-.14	-.03	.13
13	-.00	-.04	-.25	-.03	.05	.03	.12	.21	-.19	.12	.39	.01	.02

TABLE D.4. (Cont'd.).

IND	Eigenvectors												
	1	2	3	4	5	6	7	8	9	10	11	12	13
14	.19	-.00	.24	.02	-.18	.01	.00	.16	-.07	.09	.01	-.06	.10
15	.05	-.08	.02	.18	.15	-.16	.28	-.09	.14	-.24	-.17	.17	.19
16	.08	-.09	-.11	.21	.22	.11	.15	-.03	.00	.03	-.25	-.13	-.12
17	.17	-.03	.02	.30	-.03	.00	.23	.15	-.13	-.04	-.01	.01	.06
18	.01	.01	.00	.06	.13	-.00	-.44	.16	-.27	-.13	.02	-.27	-.05
19	.05	.06	.31	.05	-.18	-.04	.11	.03	.23	-.05	.01	-.10	-.06
20	.11	-.14	-.19	.06	.18	-.25	.02	.04	-.03	-.16	.16	.11	-.06
21	.10	-.03	.01	.13	.09	.03	-.31	.15	-.09	-.36	.00	.21	.31
22	.08	.27	-.07	-.02	-.20	-.16	-.02	-.11	-.13	-.06	.04	-.17	.12
23	.12	-.02	.01	-.01	.22	-.09	-.05	.14	.11	-.22	.25	-.10	-.04
24	.15	-.09	-.19	.22	-.19	.16	.07	.04	-.11	.06	-.16	.00	.03
25	-.12	.26	.19	-.07	.09	.23	.02	-.00	.02	-.04	.00	.00	.05
26	.10	.14	-.05	-.06	.18	.12	.05	.23	.01	-.05	-.21	-.36	.28
27	.03	-.23	.04	-.13	.14	.16	.07	.26	.26	.05	.05	-.04	-.03

TABLE D.4. (Cont'd.).

	Eigenvectors												
IND	1	2	3	4	5	6	7	8	9	10	11	12	13
28	.12	-.02	.15	.17	.03	-.26	-.02	.16	-.05	-.06	-.10	.10	-.22
29	.09	-.05	-.08	.20	-.10	.23	-.00	-.15	.30	-.14	.06	.08	.08
30	.11	.24	.07	.24	-.15	-.08	.09	-.00	.03	.04	.17	-.04	-.05
31	.15	.11	.02	.21	-.12	.12	-.12	.13	-.09	.14	.06	-.00	.15
32	-.04	.09	-.16	.28	-.15	-.10	-.19	.04	.11	.13	.17	.11	-.00
33	.12	.07	.18	.05	.21	-.05	-.11	-.30	-.02	.05	.06	-.07	.12
34	.16	-.11	.24	-.13	-.17	.18	.07	.09	-.16	.02	.04	.02	.02
35	.10	.27	.03	.07	.02	-.01	-.15	.04	.24	.22	.01	.26	.08
36	.26	.02	.10	-.16	-.10	.02	-.03	-.12	.04	.02	.08	.02	.01
37	.25	-.01	.13	-.05	-.10	.03	.07	-.06	.13	.01	.04	-.04	-.09
38	.15	-.08	.03	.02	-.06	-.20	-.16	-.08	.13	.33	-.20	.14	.03
39	-.08	.27	-.01	-.07	-.01	-.24	.17	.27	.06	.08	-.04	-.07	.14
40	.24	-.16	-.07	-.05	-.06	-.09	-.02	-.01	.09	-.01	.08	.04	-.03
41	.14	-.12	.32	-.12	-.09	.12	.05	.05	-.08	-.02	.01	-.02	.04

TABLE D.4. (Cont'd.).

	Eigenvectors												
IND	1	2	3	4	5	6	7	8	9	10	11	12	13
42	.16	.13	-.19	-.10	-.15	-.06	.01	.06	.05	-.23	-.12	-.07	-.13
43	.18	.14	-.19	-.05	-.08	-.05	.02	.06	.03	-.14	-.08	-.00	-.12
44	.17	.13	-.17	-.04	-.11	-.06	.10	.05	.02	-.13	-.10	.08	-.00
45	.17	.20	-.17	-.18	.07	.05	-.08	-.04	.06	.01	.03	.01	-.11
46	.15	.18	-.16	-.15	-.05	.07	-.14	.01	.10	-.11	.11	.05	-.15
47	.10	.24	.15	.04	.23	-.16	.05	-.10	.03	.07	.11	-.08	-.03
48	.23	-.00	.07	.09	.09	-.01	-.03	-.17	.12	-.19	.05	-.20	.10
49	.06	.06	-.02	-.01	.07	-.28	.14	-.16	-.28	.22	.06	.05	.04
50	.03	.15	-.10	-.27	-.04	.02	.16	.34	.03	.02	-.20	.12	.09
51	.19	.05	.10	-.19	-.06	-.05	.15	-.10	-.21	-.08	.12	.07	.08
52	.14	.04	.10	.06	.18	.00	-.14	.27	-.10	.26	-.09	.24	.14
53	.14	-.10	-.13	-.21	.05	-.16	-.10	-.05	-.04	.05	-.20	-.14	.21

TABLE D.5. Eigenvector of Situations

Peer Sample

Situation	Eigenvector
1	.32
2	.32
3	.31
4	.33
5	.32
6	.32
7	.30
8	.32
9	.29
10	.32

TABLE D.6. Eigenvectors of Behavioral Responses

Peer Sample

Behavioral Responses	Eigenvectors			
	1	2	3	4
1	.23	.11	-.75	.07
2	.37	.09	-.39	.23
3	.31	.36	.25	-.22
4	.38	.32	.22	.04
5	.38	.32	.20	.12
6	.23	-.09	.04	-.75
7	.31	-.48	.26	.20
8	.22	-.42	-.22	-.42
9	.30	-.48	.16	.32
10	.37	-.01	-.02	.03

TABLE D.7. Eigenvectors of Individuals

Subordinate Sample

IND	Eigenvectors												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1	.01	-.03	-.15	-.13	.02	.29	.16	.11	-.01	-.32	.02	-.09	-.31
2	.16	-.00	.16	.04	-.12	.12	-.20	.20	-.12	.01	-.00	-.15	-.23
3	.10	-.07	.09	-.07	.05	.26	-.38	.04	.18	-.06	.01	.24	.00
4	.11	-.06	-.06	-.38	.15	-.10	-.00	-.11	.00	.08	.10	-.00	-.02
5	.19	-.03	.10	-.18	-.20	-.05	-.04	-.05	.30	.02	-.13	.07	-.20
6	.24	-.01	-.01	-.04	-.05	-.01	-.18	.03	.03	.12	.13	-.11	-.01
7	.18	.09	.24	-.13	.01	.00	-.10	.01	.28	.03	-.04	.13	-.00
8	.01	-.14	-.23	.15	.14	.15	-.02	-.01	.08	.05	.14	.06	.17
9	.05	.11	.20	.23	-.10	.11	.06	-.19	-.24	-.20	.03	-.15	.11
10	.04	.08	.01	.05	-.33	-.03	.05	.12	.01	-.07	.43	.04	-.13
11	.01	.10	.06	-.04	.17	.31	.05	-.03	-.01	-.32	-.12	-.20	.04
12	.16	-.04	-.01	.17	.16	-.08	-.22	-.17	-.38	-.01	-.09	.03	-.14
13	-.01	.28	.01	-.01	-.05	-.06	-.11	-.04	.02	.14	.03	.15	.09

TABLE D.7. (Cont'd.).

IND	Eigenvectors												
	1	2	3	4	5	6	7	8	9	10	11	12	13
14	.13	.15	-.08	.19	.09	.02	.06	.04	.11	-.13	.01	.07	.06
15	.23	.16	-.07	.05	.03	-.16	.06	.02	.08	-.09	-.08	.03	-.11
16	-.16	.14	.13	-.11	-.12	.14	-.13	-.16	-.12	-.10	-.08	.05	.09
17	.12	.18	.03	-.10	.19	-.08	.01	.05	-.23	.03	-.01	.03	.06
18	-.16	.26	.09	-.02	-.00	.04	-.10	-.01	.09	.07	.10	-.03	-.03
19	.14	.17	-.06	-.09	-.27	.02	.09	.07	-.11	-.15	-.12	.14	-.18
20	.04	.10	-.01	.05	.26	.22	-.18	.23	.26	.13	-.10	-.02	-.17
21	.02	-.03	-.04	-.04	-.27	.13	.23	.26	.02	-.04	-.18	-.03	.20
22	-.01	-.07	.02	.16	.11	.23	.21	.13	.09	.08	.32	.11	-.03
23	.15	.06	-.16	-.29	.02	-.00	.15	-.03	-.16	.21	.16	-.03	.10
24	.04	.08	-.07	-.02	-.35	.24	-.14	-.19	.06	-.12	.17	.00	-.04
25	-.09	.11	.12	-.26	.15	.22	-.07	.02	-.15	-.03	.24	-.15	-.01
26	.10	.22	.14	.13	.04	-.17	.00	.12	.18	.05	.06	-.12	.07
27	.18	-.19	-.01	-.01	.21	.04	.00	-.03	.13	-.16	.15	.02	-.02

TABLE D.7. (Cont'd.).

IND	Eigenvectors												
	1	2	3	4	5	6	7	8	9	10	11	12	13
28	.07	.24	-.24	-.10	.05	.04	.03	.12	-.07	.02	-.03	-.02	.12
29	.03	.05	-.11	.07	.10	.12	.12	-.54	.05	.19	.15	.29	-.10
30	-.13	.17	.21	-.18	.15	-.04	-.04	.02	.01	-.03	.07	-.08	.12
31	.26	-.16	.04	.00	.02	-.10	.04	.04	-.02	-.04	-.12	.03	-.07
32	.23	-.10	.06	.08	-.04	-.18	-.10	-.16	.09	-.18	.02	-.13	.05
33	.06	.27	-.19	.01	.04	.15	.02	.03	-.06	-.00	-.02	.03	.02
34	.11	.13	.27	-.11	.11	.12	.08	-.00	-.15	.09	-.15	.05	-.02
35	.09	.20	-.11	.11	-.21	-.07	-.07	-.10	.10	-.00	.05	.02	.01
36	.21	-.02	-.00	.03	-.07	.07	-.21	.12	-.25	.10	.06	-.04	.16
37	.13	.03	.25	.15	.02	-.02	.34	-.08	.04	.01	-.14	-.09	.04
38	-.11	.07	.37	.00	-.03	.00	-.04	-.05	-.06	.11	.16	.07	-.08
39	.11	.27	-.10	-.04	.10	-.10	.03	.11	.09	.02	.04	-.01	.06
40	.15	-.07	.05	.16	-.05	.12	-.16	.10	-.27	.17	-.03	.12	-.23
41	.18	-.00	.07	.09	-.17	-.00	.02	-.10	-.10	.14	.07	-.11	.13

TABLE D.7. (Cont'd.).

IND	Eigenvectors												
	1	2	3	4	5	6	7	8	9	10	11	12	13
42	.15	.18	.07	.16	.13	-.09	.07	.06	.04	-.04	-.09	.17	-.05
43	.21	.06	-.07	.12	.03	-.13	-.18	-.01	.05	-.06	.18	-.19	.18
44	.14	.13	.02	.02	.05	.14	.19	-.29	.01	.05	-.11	.04	-.26
45	.16	-.12	-.06	-.26	-.08	.03	.10	-.11	-.03	.14	-.13	.08	.09
46	.07	-.05	.12	.04	-.01	.09	-.02	.17	-.12	-.18	-.05	.63	.39
47	.21	-.06	.14	-.01	.14	.09	-.06	-.19	.05	-.16	-.03	-.18	.26
48	.10	-.09	.15	.12	.11	.03	.21	.23	-.13	.30	.14	-.02	-.13
49	.18	-.03	.19	-.25	-.12	-.09	.11	.06	-.00	.04	.09	.02	.07
50	.15	-.05	.14	.06	-.07	.31	.19	-.03	.16	.15	.13	-.09	.21
51	.03	-.01	.07	-.09	.15	-.25	.13	.05	-.12	-.41	.39	.29	-.15
52	.07	.27	-.22	.02	.03	.07	.06	-.00	-.06	.03	.00	-.01	.03
53	.17	-.19	-.13	-.19	.04	.08	-.03	.00	-.03	-.01	.05	-.03	.08

TABLE D.8. Eigenvector of Situations

Subordinate Sample

Situations	Eigenvector
1	.31
2	.31
3	.33
4	.33
5	.32
6	.32
7	.31
8	.33
9	.31
10	.30

TABLE D.9. Eigenvectors of Behavioral Responses

Subordinate Sample

Behavioral Responses	Eigenvectors	
	1	2
1	.19	.31
2	.34	.26
3	.31	.32
4	.31	.40
5	.33	.31
6	.36	-.25
7	.34	-.38
8	.31	-.13
9	.32	-.41
10	.30	-.29

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