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Effects of implicit theories of performance on leadership and group process ratings

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EFFECTS OF IMPLICIT THEORIES OF PERFORMANCE
ON LEADERSHIP AND GROUP PROCESS RATINGS

by

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ABSTRACT

Evidence cited as validating the Vroom-Yetton model has relied on managers' self-reports of the behavior they did or would exhibit. Research suggests that knowledge of group performance can bias both group process and leadership ratings. An experimental study was conducted to determine whether descriptive ratings of leader decision-making behavior are influenced by performance cues. Further, self-ratings of their behavior biased toward consistency with implicit theories of performance. Leader decision-making style & level of performance feedback were manipulated in a 2X3 factorial design. Leaders' self-ratings were influenced by high performance feedback toward consistency with their implicit theories of performance. When given high performance feedback, group members rated their leader as more participative than a non-interacting observer, but only in the participative leader condition. Contrary to prior research, group process ratings were not biased by performance feedback. Evidence suggesting that rating leader behavior influences ratings of group process is presented.
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Introduction

The Vroom–Yetton Model

The use of subordinate participation in organizational decision-making is commonly regarded as having beneficial effects on employee commitment and motivation. However, research on the use of subordinate participation in decision-making has not provided overwhelming support for these beliefs, finding no consistent correlation with productivity (Vroom & Yetton, 1980). The Vroom–Yetton normative model of leadership represents an attempt to specify the appropriate level of subordinate participation in a particular decision-making situation. This determination is based on situational characteristics postulated to moderate the relationship between subordinate participation and organizational effectiveness (Vroom & Yetton, 1973).

The Vroom–Yetton model is composed of seven decision rules derived from the group process and decision-making literature. Three of the rules are designed to protect decision quality and four of them to insure acceptance of the decision by subordinates. The decision quality rules address the need for a quality decision, the leader's present level of information, and the degree to which the problem is structured. The acceptance rules address the degree to which subordinate acceptance is required for implementation, subordinates' willingness to accept an autocratic decision, the extent to which subordinates share organization goals,
and the likelihood of conflict over preferred solutions. These rules are arranged in the form of a decision tree and are answered to result in a feasible set of decision-making styles appropriate to the solution of the particular problem.

The decision processes specified by the feasible set may include autocratic (AI & AII), consultative (CI & CII), and group (GII) decision-making. These processes represent varying levels of the participation dimension of leader behavior. The autocratic decision-making styles include subordinate involvement, only at the request of the leader, to obtain relevant information. Using a consultative style, however, the leader shares the problem with subordinates, soliciting both information and opinions from subordinates, then makes the decision alone. In the group process the leader allows the subordinates to generate alternatives and reach a consensus on the decision chosen.

The feasible set of alternatives generated may include more than one prescribed action. In such cases, the manager is instructed to include additional criteria or personal preference in deciding on the level of participation to use. For example, time pressure, costs of having subordinates generate a quality solution, or geographic location of the subordinates may dictate that the most autocratic decision making process of the feasible set is appropriate. If the manager's goals include employee development and increased
delegation of authority, however, then the most participative solution of the feasible set should be chosen.

Validity of the Vroom-Yetton Model

Evidence for the validity of the Vroom-Yetton model comes from a few key studies. In one of the most cited (Vroom & Jago, 1978), managers who were naive to the model were asked to recall two actual decision-making situations, their behavior in these situations, and the effectiveness of the decisions on both subordinates' acceptance and decision quality. One of these situations was to represent an instance where the leader's actions led to a successful outcome according to the organization's standards. The other was to be an example in which the leader's actions led to an unsuccessful outcome. Managers then analyzed the situations, specifying the decision process used, overall effectiveness of the decision, decision quality, and the level of subordinate acceptance. The subjects were then instructed in the application of the Vroom-Yetton model and told to reevaluate the situation within its framework, thereby generating the feasible set of decision processes predicted to be most effective for their situations. The authors specifically instructed the managers to only consider the problem situation as they proceeded through the decision tree; they were to try and avoid having their answers influenced by the decision process they actually used.
For each situation generated, Jago and Vroom assessed the degree of correspondence between the decision processes specified by the model and the ones actually used. They found that for 65% of all cases, the managers' behavior fell within the feasible set generated by the model. In reporting this result, they noted that the figure was "surprisingly close to the values of 68% and 69% reported by Vroom and Yetton (1973) for behavior in recalled and standardized problems, respectively." The standardized problems referred to hypothetical cases for which managers indicated what decision making style they would use. Of the 65% of the situations where the actual decision-making style agreed to one of those specified by the model, 68% involved successful outcomes. In contrast, only 22% of the decision-making styles that didn't agree with the model's prescriptions were associated with successful outcomes.

Vroom and Jago also noted that the decision process used was predictive of successful outcomes. The success rates for the more participative behaviors (CII & GII) were 74% and 64%, respectively, while for the less participative behaviors (AI & CI) these values were 24% and 45%, respectively. While these results alone would argue for a more parsimonious model that advocated participative behavior in all circumstances, an examination of the success or failure of decisions within each decision-making process as a function of their agreement with feasible set supported the Vroom-Yetton model. In
particular, the Vroom-Yetton model enabled additional predictability for the instances in which autocratic behaviors AI and AII would succeed and those in which the participative behavior, GII, would fail. In addition, mean comparisons of the ratings of overall effectiveness from situations where decision rules were and were not violated showed statistically significant relations for five out of the seven rules.

Using an abbreviated version of the methodology from the original study validating the model (Vroom & Yetton, 1973), Hill and Schmitt (1977) found similar results. They gave graduate management students, who were unfamiliar with the model, problems with situational attributes coded to help remove any ambiguity present with case descriptions. Situational attributes were presented in the form of a table with the presence or absence of an attribute, such as whether subordinates share organizational goals, indicated by check mark in a yes or no column. Subjects were presented with all possible problem situations and asked to specify which decision style they would use in each situation. The authors concluded that their results supported the validity of the Vroom-Yetton model as subjects' responses showed greater than chance level agreement with the model's prescriptions (43.5% vs 25%). The authors also noted that the mean level of participation was higher than that advocated by the model.
In a field study of managerial decision-making, Margerison and Glube (1979) asked managers of dry cleaning stores to indicate what decision-making process they would use for each of the thirty standardized cases originally developed by Vroom and Yetton (1973). Analyses indicated that managers high on agreement with the model's feasible set had significantly higher store profitability and subordinate satisfaction than managers low on agreement with the feasible set. In reviewing the study, Field (1982) reported that Cohen's measure of effect size for these relationships was small for subordinate satisfaction (d=0.14) and near to medium for store profitability (d=0.38).

In order to provide an empirical test of the Vroom–Yetton model not based on manager's self reports of the problem situation and the behavior they used, Field (1982) examined decision-making with groups of business school students. His study represents the only systematic examination of the effects of all decision-making styles on each of the situations covered by the model. Students were randomly formed into four person teams consisting of a leader, two subordinates, and an observer. The groups attempted to solve problems representing all 23 situations covered by the model using all five decision-making processes for each situation. Problem attributes were controlled by the content of the problem descriptions given to the group members.
Each group actually solved five problems. The leaders were given descriptions of the decision-making process to be used for each situation, problem descriptions, and forms to rate the overall effectiveness, decision quality, subordinate acceptance, and leader satisfaction for each decision. The subordinates' instructions included descriptions of their role, problem descriptions, and forms to rate the overall decision effectiveness and quality, as well as their acceptance and satisfaction with each decision. The observers were instructed to observe and record the groups' activities and leaders' decision-making behavior, but not to engage in any conversation with the group. Only the data from problems in which the leader used the specified decision-making process were used in the analyses. The resulting pool represented 56% of the original data.

Hierarchical regression analyses were conducted to first account for the effects of group number, problem number, and decision processes on objective measures of decision effectiveness. After including these effects in the regression equation, there was a statistically significant effect of the whether decision-making process used by the leader was in the feasible set on decision effectiveness. Overall, 43% of the decisions made were effective, whereas 49% of those decisions within the feasible set for the situation were effective. Decision-making processes falling
outside of the feasible set for the situation were effective only 36% of the time. Of the seven decision rules underlying the model, three of the model's four acceptance rules had effects as predicted. However, only one of the three quality rules was supported. In discussing his results, Field stated, "overall, the impact on decision effectiveness of being inside or outside the feasible set is small."

Together with the data from which the individual decision rules were derived (Vroom & Yetton, 1973), these studies are the basis for assertions of validity of the Vroom–Yetton model. There are grounds from which the model's validity can be challenged. First, Field's study is the only investigation where the decision process was systematically manipulated in each situation to determine its impact on overall effectiveness. However, in finding support for only four of the seven decision rules Field has, at best, provided mild support for the Vroom–Yetton model. In addition, one could question the generalizability of the results to organizational settings. Further, effective implementation of a particular decision-making style is likely to be moderated by leader skills (Crouch & Yetton, 1987), organizational norms (Tjosvold & Deemer, 1981), and the leader–subordinate relationship (Harrison, 1985). While these topics are worthy of further study they are not the focus of this investigation.

The Jago & Vroom (1978), Hill & Schmitt (1977), and
Margerison & Glube (1979) studies have also been criticized for their use of self-reports in identifying both problem attributes and the decision-making process the manager used (Field, 1979). In addressing possible distortion of problem attributes, Vroom and Jago (1978) stated, "just as the test scores of a job applicant may change with experience on the job, so the codings, by managers, of problem attributes may change with knowledge of the success or failure of the decision." For instance, a manager who made a poor decision using the autocratic decision-making style may have concluded from the result that he or she did not have all the information required to make a quality decision. The Field (1982) study represents an attempt to control for this form of bias by using carefully coded problem attributes.

**Use of Self-Reports in Leadership Research**

Of greater concern, however, may be the validity of the ratings used to determine the decision-making process used by a manager in problem situations. Staw (1975) suggested that researchers\' conclusions about the causes of outcomes in organizational settings may be confounded due to attributions based on raters' implicit theories of performance. Staw found that subjects' knowledge of their group's performance influenced their ratings of the group. Groups randomly assigned to a high performance condition rated themselves higher on cohesiveness, communication, motivation, and
openness to change than groups assigned to a low performance condition.

Staw's study was influential in generating a stream of research which questioned the validity of conclusions drawn from investigations of leadership behavior using questionnaires. This research indicates that raters' implicit theories of leadership behavior can influence their ratings and mask the real relationships between organizational outcomes and leadership behavior (Mitchell, Larsen, & Green, 1977; Lord, Binning, Rush, & Thomas, 1978). For example, ratings of videotaped leaders on the Leadership Behavior Description Questionnaire (LBDQ) showed that both the consideration and initiating structure dimensions were susceptible to the influence of positive and negative performance cues (Rush, Thomas, & Lord, 1977). Rush et al. suggested that implicit theories, specifying the relationship between contextual factors such as group performance and leadership behavior, allow raters to generate their responses to behavioral questionnaires based on their knowledge of situational factors as opposed to the actual behavior exhibited.

DeNisi and Pritchard (1978) questioned the generalizability of these results to organizational settings and attempted to explain the performance cue effect on leader ratings as an artifact of the experimental situation. They
reasoned that the performance cue effect was due to group members' attributions of the leader when sufficient information on which to base their ratings was not available, as might be the case with students in ad-hoc groups. Students were given two one-hour problems which were completed during the two days prior to participating in the experimental task used in the Staw (1975) study. Ratings following this exercise indicated that the performance cue effect found in Staw's study was removed. However, when replicating Staw's study using groups with a twelve week history of working together, the performance cue was found to persist (Downey, Chacko, & McElroy, 1979).

In addressing these contradictory findings, researchers have raised methodological issues with the DeNisi and Pritchard study. Downey et al (1979) felt that a control condition in which subjects had no history of working together was necessary to show that the performance cue effect could be observed in their experiment. Further, Binning & Lord (1980) pointed out that while performance information was manipulated in the third problem, accurate performance feedback was given in the two previous sessions. They demonstrated that inconsistent performance cues over the three sessions could weaken the effect of the performance manipulation in the third session.

They Rush and Beauvais (1981) tested the hypothesis that the performance cue effect was due to subjects' attributions
on questionnaire items for which they were unsure. In their study they compared the ratings of subjects who rated a leader on all items of the LBDQ versus subjects who excluded items they thought were subjectively ambiguous, finding no differences between the two groups. Therefore, they concluded that the performance cue effect was not a format induced bias arising from ambiguity in the rating forms. Additionally, Rush, Phillips, and Lord found that the effect of the performance cue on behavioral ratings increased with time. They postulated that "subjects integrated both behavioral and contextual performance information into a simplified, more easily remembered form, which could then be used to infer probable levels of specific leader behavior."

Given these findings, it is entirely possible that results of the self-report measures used in the studies validating the Vroom-Yeaton model were confounded by the performance cue effect. One might expect a systematic bias in subjects' responses toward their implicit theories of the effectiveness of participative behavior in particular situations. Therefore, in asking managers to recall specific instances of decisions resulting in both good and poor outcomes, it is possible that their recall of the decision-making behavior they used was systematically biased in the Vroom and Jago (1978) study. Jago and Vroom considered sources of systematic error, stating that "the response
tendency to view one's behavior as more participative than others view behavior (Jago & Vroom, 1975) would equally effect reports for both successful and unsuccessful decisions and could not contribute to different relationships within these two categories." Consistent with their view, Leuder (1985) found that the majority of subjects completing the self administered version of the LBDQ (Lead-Self) will rate themselves consistent with the high consideration, high initiating structure stereotype of effective leaders (Powell & Butterfield, 1984; Knight & Holen, 1985). There is other evidence, however, that does not support Jago and Vroom's assumption.

Rather than finding equivalent biases in the ratings of the LBDQ for both high and low performance cues, Rush et al. (1977) found that raters primarily make a downward adjustment from the level of typical leader behavior to account for the information provided by low performance cues. Leadership ratings, using the LBDQ under normal conditions, were consistent with an implicit theory of leadership implying high or average performance. Consistent with this finding, Guzzo et al. (1986) found that under conditions of favorable feedback, evaluations of group process were similar to those made with no performance feedback. Evaluations made after receiving negative feedback, however, were reliably lower than the high and no feedback conditions. In contrast to the view of Jago and Vroom (1978), therefore, prior
research suggests that the operation of implicit theories is different depending on the level of performance information available to the rater.

In the Field (1982) study, the decision quality was rated by an independent judge, which may have left the observers free to make assessments of the leaders' behavior without bias due to knowledge of the group's performance. However, due to the nature of the problems chosen for the study, one cannot rule out the possibility that the observers knew the group's level of performance, thus biasing their ratings.

Taken together, the studies cited as validating the Vroom–Yetton model may simply indicate that people's implicit theories regarding the level of subordinate participation in decisions that is effective in various situations corresponds with the prescriptions of the Vroom–Yetton model. Evidence for such a proposition may be found in the results of a study by Heilman, Cage, Hornstein, and Herschlag (1984). They randomly selected people from Grand Central Station and asked them to read cases detailing leaders' behavior in problem solving situations. Subjects were then asked to rate the leaders' actions as effective or ineffective for each of the cases. Subjects evaluating the cases from the perspective of a subordinate never rated autocratic decision-making behavior as more effective than participative decision-making.
behavior. When instructed to use the perspective of the boss, however, subjects evaluated the cases consistent with the prescriptions of the Vroom-Yetton model. Similar results were found in the Hill and Schmitt study (1977) cited earlier. When asked what behavior they would use in problem solving situations, subjects with little or no managerial experience declared behavioral intentions consistent with the model. Based on these results it would appear that there are widely held theories of effective managerial behavior that correspond with the prescriptions of the Vroom-Yetton model.

Viewed in this light, it is possible that the true indication of the Vroom-Yetton model's validity comes from the original literature from which it was derived. Many studies have indicated that the consideration and initiating structure dimensions of the LBDQ as well as evaluative group process ratings are influenced by knowledge of group performance. If leaders' self reports of their decision-making behavior, as measured by recognition of descriptions of the Vroom-Yetton decision-making styles, are influenced by knowledge of the decision's outcome, then validation studies relying on these measures should be questioned.

Cognitive Processes Underlying the Performance Cue Effect

To understand the implications for the Vroom-Yetton validation studies, it will be useful to review research on the cognitive processes through which implicit theories of
performance can create bias in behavioral ratings. Cooper (1981) suggested that implicit personality theories influence what is attended to, how it is encoded and stored, as well as how it is evaluated. He stated, "we seem to be cognitive misers, selectively processing information and actively constructing reality in accordance with our implicit theories, themes, or categories." Feldman (1981) also advanced an information processing approach to the rating process, stating that attention, categorization, recall, and information integration are carried out by either automatic or controlled processes. Feldman stated that an automatic process is dominant, encoding information in terms of existing categories or schemata. However, when incoming information is inconsistent with these structures controlled processing takes place. The process begins with attributions of the incoming data based on contextual cues before categorization takes place. Recall of information is biased by the attributes of the categories or schemata used to encode the information. The recall process is affected by dispositional and contextual factors present at the time of recall. Therefore, both Cooper's and Feldman's information processing models indicate that information will be biased in the direction of rater's conceptual schema. An implicit personality theory is a type of schema consisting of a set of beliefs about the way traits covary in the population. These models were proposed to explain the cognitive processes
involved in the performance appraisal process and have shown great utility in guiding research in this area (DeNisi, Cafferty, & Megling, 1984).

Mount and Thompson (1987) categorized managers as being congruent or incongruent based on the extent to which their behavior met their subordinates' expectations. They found that subordinates' ratings of the quality of their manager's performance was related to this congruence. Ratings of managers who were categorized as congruent were more accurate and contained more leniency and halo tendency than those of managers who were categorized as incongruent. Krzystofik et al. (1988) had subjects read vignettes of college professors' performance. The vignettes were composed of only behavioral incidents from five behaviorally anchored rating scales of college professor performance. Subjects rated the professors on five dimensions of performance, a global performance judgement scale, and thirty trait rating scales. While the performance ratings were primarily influenced by the behaviors exhibited in the vignettes, significant additional variance in the ratings was explained by the inclusion of five personality traits uniquely related to one of the performance dimensions. On the basis of these results it was concluded that the behavioral incidents, present in the vignettes, had personality trait implications and that in the recall of these behaviors the personality characteristics
associated with them had significant incremental influence on performance judgements.

In terms of the present discussion, implicit theories of leader effectiveness refer to raters' beliefs about the way in which leadership behaviors are related to organizational outcomes. The information processing approach to social cognition has spawned a great deal of research aimed at determining the mechanism through which the performance cue effect is generated (Lord, 1985). Phillips and Lord (1981) investigated whether attribution or categorization processes govern leadership perceptions. They showed subjects videotapes of identical group processes and manipulated the salience of leader behavior, the type of performance feedback cue, and included either an augmenting or discounting causal schema of the leader's impact on the group's performance. As would be predicted by the attributional perspective, the causal schema provided to the raters was related to their perceptions of the leader. This explanation was not supported by hierarchical regression analyses, however. When the performance cue and salience manipulations were entered into the regression equation first, no unique variance was explained by the causal schema. Therefore, the authors concluded that the perceptions of leadership were independent of the causal ascriptions attributed to the leader and that the data supported a categorization process. Additionally, the results of the salience manipulation argued for a
selective attention process in the encoding of leader perceptions. Cronshaw and Lord (1987) manipulated variables relevant to both categorization and attribution processes in one videotape to determine the extent to which raters used the two processes. Specifically, the manipulated constructs were prototypicality of the leader's behavior and consensus information. The results were best explained by a categorization model of subjects' leadership perceptions. Further, Fraser, Foti, and Lord (1982) found that leader labels can influence the categories used in processing leader behaviors.

Lord, Foti, and DeVader (1984) suggested that leadership prototypes were organized hierarchically. This assertion was based on the results of subjects' reaction time in rating leader behaviors as being prototypical of a leader. Finally, Foti and Lord (1987) reported that the information people have before observing behavior will influence the categorization schema used. They found that subjects observing group behavior, with knowledge of the group's goals, processed information using a script schema. With no knowledge of the group's goals, subjects used a leader prototype schema.

While categorization of information during the encoding process can guide perceptions of leader behavior, Larsen (1982) found evidence for a rating time mechanism as opposed
to an observational one. Using a 2 X 2 factorial design, he
gave subjects a success or failure performance cue either
before or after viewing a videotaped group process. The
timing of the cue had no effect on the leader ratings,
suggesting that the performance cue guides the retrieval
process. Larsen, Lingle, and Scerbo (1984) found that, as
before, both preobservation and post observation
manipulations affected subjects' leadership ratings.
Analyzing their data using signal detection theory methods,
the authors concluded that preobservation performance cues
were mediated by selective encoding leader behavior
consistent with their implicit leadership theories. In
addition, they concluded that the mechanism for recognition
of information was a reconstruction of how the leader
probably behaved (probabalistic response bias). Their
findings also indicate that the retrieval process was of much
greater importance than the encoding process in accounting
for the performance cue effect. Martell and Guzzo (in press)
reported that raters adopt a more liberal decision criterion
when assessing the occurrence of behavior consistent with
performance information about the group.

Further support for the reconstructive nature of the
retrieval process can be gleaned from a study in which it was
found that the performance cue significantly affected
recognition accuracy for prototypical leader behavior.
Recognition accuracy for nonprototypical information was not
affected by the cue (Phillips & Lord, 1982). In this study subjects had all viewed the same tape of leader behaviors, containing five examples of both effective and ineffective prototypical behavior, as well as five examples of effective and ineffective nonprototypical behavior. All subjects accurately distinguished between present and absent behavior for the nonprototypical items. However, subjects given a performance cue were less accurate than subjects in the control condition, for both effective and ineffective prototypical behavior. Phillips (1984) reported that the percentage of prototypical information subjects identify decreases as the delay between observation and testing increases, with significant changes occurring after only forty eight hours.

These findings indicate that people have implicit theories of leadership which are used to categorize perceptions of leader behavior. Further, there is evidence that both behavioral ratings on evaluative items and recognition accuracy for schema consistent behavior are influenced by knowledge of a groups performance.

This study intends to further examine the issue of bias in the ratings of group process and leader behavior, by positive and negative performance cues. In particular, the question of whether knowledge of a decision's outcome will influence subjects' judgements of the decision-making
behavior used by the group leader will be addressed. Previous research has demonstrated that leadership measures, such as the LBDQ, are influenced by performance information. To date this influence has been observed to be primarily a downward adjustment in the ratings of leaders whose groups were thought to have performed poorly.

The effect of performance feedback on ratings of behavioral items is less definitive. Guzzo et al. (1986) reported that descriptive items were not affected by performance information. Binning et al. (1986) reported that ratings of both specific behaviors and global evaluations are influenced by performance information. Although the magnitude of the effect was much greater for the global evaluations. When behaviors are linked to performance through the implicit theories, however, performance feedback has been reported to influence ratings (Martell and Guzzo, in press). In previous studies self-ratings of decision-making behavior, have asked subjects to indicate which of four specific leader behaviors they would or did use. This study will empirically determine whether leader decision-making behavior is linked to performance outcomes via implicit theories and if ratings are susceptible to bias by performance information.

While research has shown that observers' ratings of leaders on the LBDQ are influenced by a performance cue, in order to draw conclusions applicable to the validation
studies conducted by Jago and Vroom (1978) it is critical to demonstrate that leaders self-ratings of their decision-making behavior are influenced by knowledge of their group's performance. However as Heilman et al. (1984) demonstrated, when subjects hold the role perspective of group leader, their ratings of the decision-making behavior which leads to effective outcomes in particular situations show good agreement with the Vroom-Yetton model. Further, Hill and Schmitt (1977) demonstrated that while subjects' reported behavioral intentions did show agreement with the prescriptions of the Vroom-Yetton model, there were considerable individual differences. Therefore, one would expect leaders' self-rating of their decision-making behavior to be influenced by the performance cue, toward consistency with their individual implicit theories of performance. Hypotheses one and two are as follows:

Hypothesis H1

Group leaders' implicit theories regarding the decision-making behavior used by a "most effective" leader in situations covered by the Vroom-Yetton model will show the same level of agreement with the feasible set of decision-making behavior as has been reported in prior research. Group leaders' implicit theories regarding the decision-making behavior used by a "least effective" leader in situations covered by the Vroom-Yetton model
will show little agreement with the feasible set of decision-making behavior prescribed by the model.

**Hypothesis H2**

Group leaders will show the performance cue effect in rating the behavior they used during a group exercise. Self-ratings by leaders given high performance feedback will correlate positively with their ratings of a "most effective" leader and show no correlation with ratings of a "least effective" leader. Self-ratings by leaders given low performance feedback will show the opposite pattern of results. Self-ratings by leaders given no performance feedback will not correlate with ratings of either the "most effective" or "least effective" leader.

The results of Heilman et al. (1984) indicate that subjects holding the role perspective of subordinate view participative decision-making behavior as leading to more effective performance than autocratic decision-making behavior, regardless of the particular situation. Therefore, knowledge of the groups' performance should bias group members' ratings of their leader toward consistency with this implicit theory of performance. Based on these observations hypothesis number three is as follows:

**Hypothesis H3**

Ratings of leader decision-making behavior will be
subject to the performance cue effect. Groups given low performance feedback will rate their leaders' behavior as more autocratic than the control or high performance feedback groups.

Additionally, the studies in which subjects participated in the group process did not include a condition in which performance feedback was controlled. Therefore, this study will attempt to replicate the influence of the performance cue on group process ratings and determine its operation relative to the control condition. Hypotheses four is as follows:

**Hypothesis H4**

Subjects' ratings of their group on process measures will be influenced by the performance cue given to the group. Subjects given low performance feedback will rate their group lower on group process measures than subjects from groups given no or high performance feedback.
Method

Procedure:

The experimental design used in this study was a 2 X 3 factorial design, manipulating the leaders' decision-making style (autocratic vs participative) and the feedback provided to the groups regarding their performance (high, low, or none). The experiment was conducted over three separate days. A general outline of the design is as follows: First, subjects were tested to determine their implicit theories of the level of participation leading to particular outcomes in the situations addressed by the Vroom-Yetton model. At least ten days after completing the implicit theory measure, subjects were assigned roles then instructed to complete a group decision-making problem. Roles were assigned randomly except to insure that male and female leaders were balanced across leader decision-making style. The groups consisted of a leader, two group members, and an observer. Group leaders were instructed to behave in either a participative or autocratic manner during the exercise to insure a range of participative behavior. Upon completion of the exercise, the group observer judged the leader's decision-making style and made group process ratings. Finally, ten days later, groups were randomly given either high, low, or no performance feedback, balanced across the leaders' decision-making style, and asked to judge the leader's decision-making style.
Implicit Leadership Measure:

All subjects were instructed to complete a questionnaire to determine their conceptions of the behavior likely to be displayed by effective and ineffective leaders in various situations. Subjects were instructed to imagine themselves in the role of Division Manager in an organizational setting in order to control for effects due to role perspective (Hielman et al., 1984). Next they were asked to bring to mind an image of a "most effective" and a "least effective" group leader in their Divisions. After familiarizing themselves with the Vroom–Yetton decision-making styles discernable during a group exercise (AI, AII, CII, GII), subjects were presented a packet of 32 decision-making situations. For each situation they were instructed to indicate the decision-making styles used by their "most effective" and "least effective" leaders.

Situations were coded in terms of the presence or absence of five situational attributes identified by the Vroom–Yetton model. All possible combinations of the following attributes were presented: The leader does or does not have enough information to make a quality decision. The problem is or is not structured. Acceptance of the decision by subordinates is or is not critical to implementation. Subordinates would or would not accept a decision made by the leader alone. Subordinates do or do not share the organizations goals in solving this problem. In addition, all presentations began with a statement indicating that a high quality decision was
important in the situation. The order of presentation of the other five attributes manipulated was as listed above. The order of presentation of the thirty two situations was randomized across subjects. Subjects either completed the packet as part of an in-class exercise or as a take home assignment. Subjects not completing the premeasure were excluded from assignment to the role of group leader.

The dependent measures were the leader decision-making styles indicated for both "most effective" and "least effective" leaders for each of the thirty two situations. Thus, each subject made 64 ratings of leader decision-making styles.

**Group Exercise:**

The second step in the experimental procedure was to randomly assign subjects into groups of four, with each person designated as either the group's leader, a non-interacting observer, or as one of two group members. Male and female leaders were equally distributed across the decision-making style manipulation. The leader and the two group members completed a management decision-making exercise (Hersey & Natemayer, 1987) in which they acted as a performance review board whose charge was to develop two separate rank orderings of eight employees in the software development group of an organization (Appendix A). The rank orderings were to determine the employee most qualified for promotion as the software development group's manager and to
judge who was most worthy of a merit increase. The problem was similar to other group problem-solving exercises, such as Lost in the Desert orLost on the Moon, where the groups' rankings were compared with experts' ratings. The problem was scored by adding up the deviation between the groups' and experts' ratings for each individual on the two tasks. The higher the groups' raw score the lower their performance was judged to be. This particular problem was chosen for its potential interest to MBA students and because no clear indication of the level of performance was available to the participants prior to having scored the problem.

The leaders of the groups were given instruction packets for all group members in order to assist in establishing them in their roles as leader. The observers were given a statement describing the groups' task and their role as a non-interacting observer of the group. The group leader were instructed to exhibit either autocratic or participative behavior. This manipulation was conducted to determine if the influence of performance feedback on leader ratings depends on the level of participation exhibited by the leader. Group members were given instructions with a statement of the problem and directions to follow the leader. Following completion of the problem the observers completed a rating form where they indicated the decision-making style (AI, AII, CII, or GII) used by the group leader. In
addition, they completed ratings on eight scales (1 to 7, Likert type) of group process variables, including the quality and quantity of communication, coordination of group activities, team spirit, enjoyment, commitment, and quality of the groups' answer to the problem (See Appendix B). The observers' ratings of the leaders' decision-making behavior were used as a check of the leader decision-making style manipulation. The other group members simply turned in their employee rankings, ending the exercise.

Judgements of leader decision-making behavior and group process ratings were delayed in order to increase the recall demands of the situation and heighten the performance cue effect. Unlike other studies using a delayed rating condition (Rush, Phillips, & Lord, 1981), however, feedback of the groups performance not given immediately following the group exercise. Groups were given feedback ten days following the group exercise and just prior to completing judgements of the leader's decision-making style and ratings of group process. Delaying both performance feedback and the recall of behavior more accurately simulates the information processing demands of the Vroom and Jago study (1978) and those present in organizations. This procedure should not only increase the relevance of these results to the validity claims of Vroom and Jago, but also increase the generalizability of the results to organizational settings.
Post-Exercise Ratings:

Ten days following the group exercise the leaders and group members were given performance feedback and asked to complete a rating form (Appendix C). The groups' were randomly assigned to either a high, low, or no performance feedback condition. In the high and low performance feedback conditions, groups were told that their score was either well above average or well below average, based on norms published by the problem's creators. Leaders' and members' ratings of the quality of their groups answer to the problem were used to verify the performance feedback manipulation. This item was presented after items rating leader decision-making behavior, situational attributes, and group process variables.

Subjects' implicit theories of performance leading to positive and negative outcomes in the experimental situation were determined from the premeasure and ratings of situational attributes made following the group exercise. After rating the leader's decision-making behavior, all subjects coded the group exercise according to situational attributes of the Vroom-Yetton model. Situational attributes were presented using the same wording as in the premeasure. Finally, subjects rated their group on eight group process measures and indicated the quality of the group's decision.

After the subjects had completed the evaluation forms, the bogus performance feedback manipulation was revealed and
the groups' true scores were handed out. The experimenter then discussed the experimental design, the hypotheses being tested, and the experts rational for scoring the problem.

Subjects:

Subjects (n=206) participating in this study were graduate MBA and undergraduate psychology students. Neither groups had been instructed in the Vroom-Yetton model prior to their participation in this study. Graduate students participated as part of an in-class exercise during an Organization Theory or Career Management course. Undergraduate subjects, participated either for course credit for a psychology course or as part of an in-class exercise during an Industrial-Organizational Psychology course.
Results

Analysis of Implicit Leadership Measure

Subjects' mean participation ratings for the "most effective" leaders, averaged across situations, was 2.74 while the mean was 1.96 for "least effective" leaders. This indicates that subjects rated their "least effective" leader as using more autocratic decision-making behavior than their "most effective" leader. The means and corresponding variances are displayed in Table 1.

Table 1
Means and Variances Collapsed Across Situations for each Leader Type (Most/Least Effective)

<table>
<thead>
<tr>
<th>Leader Type</th>
<th>Mean</th>
<th>SD</th>
<th>Variance</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most Effective</td>
<td>2.74</td>
<td>.34</td>
<td>0.83</td>
<td>.29</td>
</tr>
<tr>
<td>Least Effective</td>
<td>1.96</td>
<td>.50</td>
<td>1.56</td>
<td>.66</td>
</tr>
</tbody>
</table>

(n=201)

The agreement between subject's ratings of decision-making behavior of their "most effective" and "least effective" leaders and the behavior prescribed by the Vroom-Yetton model was calculated using three different criteria; agreement with any of the decision-making styles specified by the entire feasible set, agreement with the most autocratic style in the feasible set or agreement with the most participative style in the feasible set. These levels of agreement, along the with
the chance level of agreement and the results of previous research are presented in Table 2. These results emphasize the difference in subjects' ratings of their "most effective" and "least effective" leaders. The mean agreement of the "least effective" leader's behavior was lower than that of the "most effective" leader regardless of the criterion of agreement used. The agreement of the "most effective" leader's behavior was greater than the chance level of agreement for all criteria. Similarly, the agreement of the "least effective" leader behavior was lower than chance for all criteria.

Table 2

Percent Agreement of Leader Type (Most/Least Effective), Chance, and Previous Research With V-Y Feasible Set

Criteria for Agreement

<table>
<thead>
<tr>
<th></th>
<th>Entire Set</th>
<th>Autocratic</th>
<th>Participative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Most Effective</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Percentage</td>
<td>78.2</td>
<td>40.4</td>
<td>37.1</td>
</tr>
<tr>
<td>Std Dev</td>
<td>16.8</td>
<td>18.6</td>
<td>20.5</td>
</tr>
<tr>
<td><strong>Least Effective</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Percentage</td>
<td>31.3</td>
<td>14.9</td>
<td>10.2</td>
</tr>
<tr>
<td>Std Dev</td>
<td>9.4</td>
<td>11.8</td>
<td>9.5</td>
</tr>
<tr>
<td>Vroom &amp; Yetton (1973)</td>
<td></td>
<td></td>
<td>40.0</td>
</tr>
<tr>
<td>Hill &amp; Schmitt (1977)</td>
<td></td>
<td></td>
<td>43.5</td>
</tr>
<tr>
<td>Chance Level</td>
<td>57.8</td>
<td>25.0</td>
<td>25.0</td>
</tr>
</tbody>
</table>
Previously, Hill and Schmitt (1977) reported a mean level of agreement, using the most autocratic criteria, of 43.5%. Additionally, Vroom & Yetton (1973) reported their level of agreement, using the same criterion, to be 40%. In this study, the ratings of subjects' "most effective" leader showed an average agreement of 40.4%. The percentage of agreement for the "least effective" leader was only 14.9%. However, an important methodological distinction must be made when comparing results from this study with those of prior research. In prior studies subjects were asked to indicate, as accurately as possible, the decision-making style that they would or did use in each situation. However, in this study subjects were instructed to indicate the decision-making style used by a hypothetical "most effective" leader. Therefore, results of this study support hypothesis H1 in that subjects' implicit theories of the type of decision-making behavior that is appropriate in different situations do agree with self-reports of both behavioral intention and actual behavior in those situations. In addition, subjects' implicit theories regarding ineffective decision-making behavior show little agreement with the Vroom–Yetton model.

To further explore how subjects distinguished between the behavior of a "most effective" and "least effective" leader as they completed the premeasure, repeated measures MANOVA of ratings of likely decision-making behavior on the leader type
and situation were conducted. The results of this analysis show a significant interaction between the leader type ("most effective" or "least effective") and the situation \( F(31.170) = 47.7, p < .0001 \). This interaction indicates that subjects weigh situational attributes differently in predicting the behavior that leads to positive and negative outcomes. The nature of this interaction was explored using repeated measures MANOVA, for each leader type, to assess how well the situation predicts ratings of decision-making behavior. These analyses, presented in Table 3, show the strong influence of situational attributes on subjects' ratings of the behavior likely to lead to both positive and negative outcomes. With regard to the decision-making behavior leading to positive outcomes, this finding is consistent with prior research (Vroom & Yetton, 1973; Hill & Schmitt, 1977).

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>Lambda</th>
<th>F Value</th>
<th>p</th>
<th>omega²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Most Effective</strong></td>
<td><strong>SIT</strong></td>
<td>31.170</td>
<td>0.074</td>
<td>68.2</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Least Effective</strong></td>
<td><strong>SIT</strong></td>
<td>31.170</td>
<td>0.181</td>
<td>24.9</td>
<td>0.0001</td>
</tr>
</tbody>
</table>
In addition to the main effect of situation for ratings of each leader type, there are differences in the degree to which subjects relied on situational attributes in making their ratings of "most effective" and "least effective" leaders. The values of Wilke's Lambda and a corrected multivariate omega² (Tatsuoka, 1988) are greater for the ratings of behavior used by the "most effective" leader than for the "least effective" leader. The multivariate omega² may be positively biased in predicting population effect sizes. However, the use of omega² is justified to compare effect sizes from the same experiment with identical degrees of freedom. This comparison indicates that subjects' implicit theories of the relationship between participation in decision-making and performance outcomes is more differentiated, with respect to situational attributes, for an effective leader than an ineffective leader.

Subjects' implicit theories of effective and ineffective decision-making behavior in the experimental situation were determined using their perception of the experiment's situational attributes. Based on their ratings of situational attributes and the premeasure ratings, the decision-making behavior used by the "most effective" and "least effective" leaders could be chosen.

**Manipulation Checks**

Manipulation checks showed that the experimental manipulations worked as intended. Observers' ratings of the
leaders' decision-making style, completed at the end of the problem-solving session, indicated that the group leaders did follow the instructions they were given. Consistent with prior research (Vroom & Yetton, 1973) the ratings of the leaders' decision-making behavior were transformed to a continuous scale with AI=1, AII=2, CII=3, and GII=4. Regressing the observers' leader ratings on the experimental manipulations (leader decision-making style and performance feedback) showed a significant main effect of leader decision-making style, $F_{(1, 48)}=25.78$, $p<.0001$, $\omega^2=0.30$. Leaders instructed to guide their group toward consensus (GII) were seen as more participative ($M=3.59$) than those instructed to solicit information then make the rankings themselves (AII, $M=2.78$). Including the leaders' implicit theory of effective decision-making in the regression equation indicated that group leaders did not show a tendency to use the decision-making style they felt would lead to an effective outcome in the experimental situation. Observers' ratings of the leader where not related to the leaders' implicit theory of effective decision-making, $F_{(1, 47)}=2.93$, $ns$.

The operation of the performance cue was investigated by examining leaders' and members' ratings of their groups' decision quality. Regression of perceived decision quality on the experimental manipulations and role perspective indicated that performance feedback operated the same for
both leaders and group members. The interaction of role perspective and performance feedback was not significant \( (F_{(2,140)} = 1.48, \text{ ns}) \). In addition, role perspective did not interact with the decision-making style used by the leader \( (F_{(2,140)} < 1, \text{ ns}) \).

The manipulation of performance feedback, influenced ratings of decision quality \( (F_{(2,148)} = 19.67, p < .0001, \text{ epsilon}^2 = 0.17) \). Subjects in the low performance condition rated their groups' decision quality lowest \( (M = 3.91) \), subjects in the high performance condition rated theirs highest \( (M = 5.10) \), while subjects in the control group rated theirs between the two \( (M = 4.50) \). Ratings of decision quality were made on a one (very low) to six (very high) scale. All differences between the means were significant using Tukey's studentized range statistic. While there were differences in perceived performance, the means for all groups were above the scale's midpoint. These mean values indicate that subjects felt their groups performed fairly well, in spite of the performance feedback they were given. This result is consistent with prior studies manipulating performance feedback given to ad-hoc groups (Staw, 1975; DeNisi & Pritchard, 1978; Downey, et al., 1979; McElroy & Downey, 1982). Observers' ratings of the groups' decision quality were unrelated to the level of performance feedback the group was given \( (F_{(2,34)} < 1, \text{ ns}) \).
The manipulation of leader decision-making style also
directly influenced ratings of perceived decision quality
\(F(1,148)=21.0, p<.0001, \epsilon^2=0.11\). Ratings of groups
where the leader was given participative instructions were
higher (\(M=4.89\)) than those of groups where the leader was
given autocratic instructions (\(M=4.10\)). There are a number
of possible explanations for this result. The effect could
be the result of actual performance differences resulting
from the leaders' use of participative and autocratic
decision-making styles. This explanation is unlikely,
however, as observers ratings of the groups' decision quality
were unrelated to the decision-making style used by the
leader (\(F(1,34)<1, \text{ ns}\)). The effect could also reflect
subjects' belief that greater use of participation leads to
more effective outcomes. This alternative is supported by
the implicit leadership data. Leaders rated a "most
effective" leader as more participative (\(M=2.74\)) than a
"least effective" leader (\(M=1.96\)). For subjects with the
group member perspective this difference is likely to be even
greater. Finally, instructing leaders to use an autocratic
decision-making style may have run counter to norms of
informal groups and the leaders' preferences to use a more
participative decision-making style. The validity of this
explanation, however, can not be tested directly.
Influence of Implicit Theories on Leader Ratings

Ratings of the leaders' decision-making behavior were analyzed separately from the group process ratings. The data were also examined for differences between the ratings of MBA students and undergraduates. Analyses on both the composite of group process variables and the leader ratings revealed no significant interactions involving subjects' level of education. In subsequent analyses, the data were collapsed across this variable. Finally, as observers ratings were completed prior to having any knowledge of performance information their data were excluded from further analyses.

Hypotheses H2 and H3 make different predictions regarding the effect of performance information on ratings of leader decision-making behavior as function of role perspective. Theoretically, when aware of the groups level of performance, an individual's rating of leader decision-making behavior should be biased toward consistency with their implicit theory of performance appropriate in the situation. Heilman et al.'s results (1984) indicate that implicit theories of decision-making behavior are different for leaders and group members. Subjects having the group member perspective rated leaders as more competent as their use of participative decision-making increased. With the perspective of leader, however, raters implicit theories of effective decision-making behavior agreed with the Vroom-Yetton model.
Hypothesis H2 predicts that leaders' implicit theories of decision-making should interact with performance feedback in predicting self-ratings of their decision-making behavior. Specifically, ratings of the behavior used by a "most effective" leader should predict self-ratings of decision-making behavior only when the group was given high performance feedback. Similarly, "least effective" leader ratings should predict self-ratings of decision-making behavior only when the group was given low performance feedback.

Hypothesis H3, however, simply predicts that members of groups given low performance feedback would rate their group leader's decision-making behavior as more autocratic than members whose groups were given high or no performance feedback. The implicit leadership measure used in this experiment is not expected to interact with performance feedback in predicting group members' leader ratings. In completing the premeasure all subjects were instructed to assume the role of a division head and indicate how a "most effective" and "least effective" supervisor in their organization would behave. Therefore, the role perspective of group members in completing the premeasure was different than the problem-solving session.
Implicit Theories of Effective Performance

Predictions were tested by regressing ratings of leader decision-making behavior on role perspective, decision-making style, performance cue, and implicit theory of effective performance. This analysis revealed a four-way interaction ($F_{(2,121)}=3.09$, $p<.003$). The interaction was decomposed by conducting analyses separately for leaders and members. The error term from the overall analysis was used in calculating $F$ values in these and further analyses. Regressing the leaders' self-ratings on decision-making style, performance feedback, and implicit theory of effective performance revealed a significant three-way interaction ($F_{(1,121)}=4.02$, $p<.025$). For group members, however, theory of effective performance did not interact with performance feedback or decision-making style. These results indicate that the influence of raters' implicit theories of effective decision-making behavior, as measured in this exercise, do depend on raters' role perspective.

To test the specific predictions for leaders self-ratings made by hypothesis H2, the three-way interaction was broken down by performance feedback. Results of regressing leaders' self-ratings on decision-making style and theory of effective performance are presented in Table 4. As predicted by hypothesis H2, self-ratings by leaders of groups given high performance feedback were not only influenced by the
leaders' decision-making style, but also their implicit theories of effective decision-making. Further, this effect was in the predicted direction as evidenced by the positive bivariate correlation between the implicit theory measure and the leaders' self-ratings \( (r=.52) \). In contrast, the bivariate correlations for the no performance feedback \( (r=.25) \) and low performance feedback \( (r=.11) \) conditions were not significantly different from zero. There were, however, significant interactions of decision-making style and the

### Table 4

Hierarchical Regression of Leaders' Self-Ratings on Decision-Making Style and Theory of Effective Performance for each Level of Performance Feedback

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance Feedback</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-M Style</td>
<td>2.72</td>
<td>1</td>
<td>10.71**</td>
</tr>
<tr>
<td>Effective</td>
<td>0.51</td>
<td>1</td>
<td>2.04</td>
</tr>
<tr>
<td>Style * Eff</td>
<td>0.99</td>
<td>1</td>
<td>3.96**</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-M Style</td>
<td>6.72</td>
<td>1</td>
<td>26.45**</td>
</tr>
<tr>
<td>Effective</td>
<td>0.00</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Style * Eff</td>
<td>1.04</td>
<td>1</td>
<td>4.16*</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-M Style</td>
<td>6.72</td>
<td>1</td>
<td>26.45**</td>
</tr>
<tr>
<td>Effective</td>
<td>1.63</td>
<td>1</td>
<td>6.52*</td>
</tr>
<tr>
<td>Style * Eff</td>
<td>0.02</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Error</td>
<td>30.68</td>
<td>121</td>
<td></td>
</tr>
</tbody>
</table>

* p<.05  
** p<.01
implicit theory measure for these two levels of performance feedback.

In the no performance feedback condition, the results in Table 4 indicate a significant interaction of the implicit theory measure with the decision-making instructions given to the leader. The interaction was broken down by regressing leaders' self-rating on their implicit theory of effective decision-making. The main effect of implicit leadership theory was not significant for participative ($F_{(1,121)}=1.90$, ns) or autocratic ($F_{(1,121)}=2.19$, ns) decision-making styles. The regression lines for participative and autocratic leaders in the no performance feedback condition are depicted in Figure 1. The slope of the regression line for the participative leaders ($b=.25$) indicates that their self-ratings were biased in the same manner as leaders of groups given high performance feedback ($b=.24$). However, self-ratings of autocratic leaders given no feedback, were negatively related ($b=-.22$) to their implicit theories of effective decision-making. Therefore, it appears that self-ratings of leaders given high performance feedback as well as participative leaders given no performance feedback are biased toward their implicit theories of effective decision-making. When given no performance feedback and instructed to use an autocratic decision-making style, however, self-ratings of leaders are negatively related to their implicit theories of effective decision-making.
Influence of Implicit Theory
No Performance Feedback

Figure 1

Influence of Implicit Theories
Low Performance Feedback

Figure 2
The results of Table 4 also indicate a significant interaction of the implicit theory measure with the decision-making instructions given to the leader in the low performance feedback condition. This interaction was reduced by regressing leaders' self-ratings on their implicit theory of effective decision-making. The main effect of implicit leadership theory was significant for the autocratic leaders ($F_{1,121}=5.91$, $p<.025$), but not for participative leaders ($F_{1,121}<1$, ns).

The regression lines for participative and autocratic leaders in the low performance feedback condition are depicted in Figure 2. As predicted by hypothesis H2, self-ratings of participative leaders given low performance feedback are not influenced by their implicit theories of effective decision-making. For the leaders instructed to use an autocratic style, however, the results are contrary to predictions. The slope of the regression line for the autocratic leaders ($b=.50$) indicates that their self-ratings were biased toward consistency with their implicit theories of effective decision-making. It is unlikely that this result is due to inconsistencies in the performance feedback manipulation. The autocratic leaders given low performance feedback rated their perceived decision quality lowest ($M=3.11$) of all leaders in the study. The effect could be a function of having manipulated the leaders' decision-making style but it is difficult to envision a mechanism for such an
effect. Given that only nine leaders were in each cell, however, this could be a chance result.

Regressing leaders' self-ratings on decision-making style, theory of effective performance, and perceived decision quality also yields results consistent with hypothesis H2. These results are depicted in Table 5. The interaction of perceived decision quality and theory of effective performance is significant. Bivariate correlation of the product of these variables with the leaders' self-ratings (r=.32) indicates the effect was in the predicted direction. Leaders who feel they performed well rated their behavior as more participative when they feel that greater use of participation leads to more effective outcomes.

Group members' leader ratings were regressed on decision-making style, performance feedback, and implicit theory of effective performance. Although subjects adopted the role of leader in completing the premeasure, leader ratings by group members were related to the implicit leadership measure, F(1,84)=4.55, p<.05). There were no significant interactions of the implicit theory measure with either decision-making style or performance feedback. The slope of the regression line (b=.11) indicates that group members rated their leader favorably with respect to their implicit theory of effective performance as measured in this study.
Table 5
Regression of Leaders' Self-Ratings on Decision-Making Style, Theory of Effective Performance, and Perceived Decision Quality

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F value</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-M Style</td>
<td>0.09</td>
<td>1</td>
<td>0.33</td>
</tr>
<tr>
<td>Effective</td>
<td>2.00</td>
<td>1</td>
<td>7.64**</td>
</tr>
<tr>
<td>Style * Eff</td>
<td>0.11</td>
<td>1</td>
<td>0.43</td>
</tr>
<tr>
<td>Perceived Dec Qual</td>
<td>1.49</td>
<td>1</td>
<td>5.69*</td>
</tr>
<tr>
<td>PDQ * Style</td>
<td>0.00</td>
<td>1</td>
<td>0.01</td>
</tr>
<tr>
<td>PDQ * Eff</td>
<td>1.41</td>
<td>1</td>
<td>5.37**</td>
</tr>
<tr>
<td>PDQ * Style * Eff</td>
<td>0.17</td>
<td>1</td>
<td>0.64</td>
</tr>
<tr>
<td>Error</td>
<td>12.06</td>
<td>46</td>
<td></td>
</tr>
</tbody>
</table>

Implicit Theories of Ineffective Performance

Hypothesis H2 also made specific predictions regarding the influence of leaders' implicit theory of ineffective performance on their self-ratings of decision-making behavior. Implicit theories of ineffective performance should interact with the level of performance feedback given to the group in influencing leader ratings. As before, this interaction was predicted for leaders but not group members. Specifically, the theory of ineffective performance was hypothesized to be predictive of self-ratings for leaders of
groups given low performance feedback. Self-ratings by leaders of groups given high or no performance feedback would not be expected to be influenced by the theory of ineffective performance.

These aspects of Hypothesis H2 were tested by regressing ratings of the leaders' decision-making behavior on decision-making instructions, performance feedback, implicit theory of ineffective performance, and role perspective. There were no main effects or interactions involving role perspective. In particular, the interaction of role perspective, performance feedback, and implicit theory of ineffective performance was not significant ($F_{(2,121)}=2.58$, $p<.08$). However, as specific hypotheses regarding leaders' implicit theories of ineffective performance were advanced, planned comparisons were conducted.

Self-ratings of decision-making behavior were regressed on decision-making style and theory of ineffective performance for each level of performance feedback. There was no effect of the leaders' theory of ineffective performance for the low ($F_{(2,121)}=1.12$, ns), no ($F_{(2,121)}<1$, ns), or high ($F_{(2,121)}=3.07$, ns) performance feedback conditions. Regressing self-ratings on decision-making style, theory of ineffective performance, and perceived decision quality yielding consistent results. The interaction between perceived decision quality and theory of ineffective performance was not significant ($F_{(2,137)}<1$, ns).
The leader ratings also were collapsed across role perspective and regressed on decision-making instruction, performance feedback, and the ineffective leader implicit theory. The implicit theory of ineffective performance did not interact with either decision-making style or performance feedback. There was however, a main effect of theory of ineffective performance ($F_{(1,138)}=6.24$, $p<.01$). The slope of this regression line ($b=-.08$) indicates a general tendency to rate the leader as more participative compared with one's implicit theory of ineffective leadership as judged from the leader perspective.

**Summary of Implicit Theory Effects on Self-ratings**

To summarize the results of analyses performed to test hypothesis H2, the supported following conclusions: Leaders' self-ratings of their decision-making behavior were influenced by the their implicit theories of effective decision-making behavior. This influence was dependent upon both the leaders' decision-making style and the level of performance feedback given to the group. These interactions are generally supportive of predictions advanced by hypotheses H2. Leaders' and members' leader ratings were also related to their theories of ineffective performance. Contrary to hypothesis H2, however, the implicit theory of ineffective performance did not interact with either role perspective or performance feedback. The effect seems to
represent a tendency to rate decision-making behavior participatively with respect to one's implicit theory of ineffective performance.

The interaction of leaders implicit theory of effective performance with performance feedback and decision-making style is more complex. In the high and no performance feedback conditions, results are consistent with the hypothesized effects. When given high performance feedback, autocratic and participative leaders' self-ratings were biased toward consistency with their theories of effective performance in the situation. In the no performance feedback condition only self-ratings of leaders instructed to use a participative decision-making style and given showed this pattern. When instructed to use an autocratic style self-ratings were negatively related to their implicit theories of effective performance.

In the low performance feedback condition, self-ratings of autocratic leaders were related to leaders' implicit theories of effective performance, but the effect was contrary to predictions. These leaders rated their decision-making behavior consistent with their theory of effective performance even though they had been given low performance feedback. Self-ratings of participative leaders given low performance feedback, on the other hand, were not related to their implicit theories of effective performance.
**Analysis of Group Members' Leader Ratings**

Regression of leader ratings on decision-making style and performance feedback for group members, leaders, and observers are presented in Table 6. Role perspective did not

<table>
<thead>
<tr>
<th>Table 6</th>
<th>Analysis of Variance of Leader Rating on Decision-Making Style and Performance Feedback on for Each Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>SS</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>Group Members</strong></td>
<td></td>
</tr>
<tr>
<td>D-M Style</td>
<td>34.11</td>
</tr>
<tr>
<td>Performance Cue</td>
<td>0.66</td>
</tr>
<tr>
<td>Style * Cue</td>
<td>0.54</td>
</tr>
<tr>
<td>Error</td>
<td>23.95</td>
</tr>
<tr>
<td><strong>Group Leaders</strong></td>
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</tr>
<tr>
<td>D-M Style</td>
<td>15.57</td>
</tr>
<tr>
<td>Performance Cue</td>
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</tr>
<tr>
<td>Style * Cue</td>
<td>0.59</td>
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<tr>
<td>Error</td>
<td>15.78</td>
</tr>
<tr>
<td><strong>Observers</strong></td>
<td></td>
</tr>
<tr>
<td>D-M Style</td>
<td>10.51</td>
</tr>
<tr>
<td>Performance Cue</td>
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</tr>
<tr>
<td>Style * Cue</td>
<td>0.56</td>
</tr>
<tr>
<td>Error</td>
<td>17.76</td>
</tr>
</tbody>
</table>
interact with any of the experimental manipulations. The results do not support predictions made by hypothesis H3. Group members given low performance feedback did not rate their group leaders' decision-making behavior as less participative than those from groups given high or no performance feedback. As indicated in Table 7, the trend in means is opposite to that predicted by hypothesis H3. Group members given low performance feedback rated their group leader's behavior as more participative (M=3.35) than members of groups given no (M=3.12) or high (M=3.27) performance feedback.

Only the effect of leader decision-making style was statistically significant and influenced group members' ratings of the leader's decision-making behavior. Omega2 for this effect was 0.57 indicating that subjects were able to accurately recognize the decision-making behavior used by the leader. This conclusion is supported by analyses regressing group members leader ratings on perceived decision quality and decision-making style. Perceived decision quality accounted for no unique variance in members' ratings, $F_{(1,93)}=1.89$, ns). If perceived decision quality was entered first in a hierarchical regression analysis followed by decision-making style significant variance was explained, $F_{(1,93)}=8.07$, p<.0001. However, the percentage of variance explained by level of instruction (45.3%) was nearly four
times greater than that accounted for by the perceived decision quality (13.6%).

As reported earlier, the theories of effective and ineffective performance accounted for significant variance in group members' leader ratings. These results indicate that using the theories of effective and ineffective performance as covariates in an ANCOVA may be a more sensitive test in detecting the influence of performance feedback. The results are consistent with those reported in Table 6, however. Performance feedback did not influence group members' ratings of the leaders' decision-making behavior. $F_{(2, 83)} < 1$, ns.

The results exhibited in Table 6 indicate that taking a difference score between the observers' and group members' ratings may more accurately detecting the influence of performance feedback. The manipulation of the leaders' decision-making style accounts for a greater percentage of variance in group members' ratings ($\omega^2 = 0.57$) than it does for observers' ratings ($\omega^2 = 0.37$). If group leaders did indeed exhibit the behavior they were instructed, one would conclude that group members are more accurate in rating leaders' decision-making behavior. Given that observers made immediate ratings of the leader with no knowledge of group performance, it is unlikely that members were more accurate after a weeks' delay. Observers' ratings may represent the actual behavior the leader exhibited. The difference score would be more accurate indicator of the level of bias in
Table 7

Mean Participation Ratings of Group Leaders by Leaders, Members, Observers for each Level of Performance Feedback and Decision-Making Style

<table>
<thead>
<tr>
<th>Role</th>
<th>Performance Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Group Members</td>
<td></td>
</tr>
<tr>
<td>autocratic leader</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>2.82</td>
</tr>
<tr>
<td>SD</td>
<td>0.64</td>
</tr>
<tr>
<td>N</td>
<td>17</td>
</tr>
<tr>
<td>participative leader</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3.85</td>
</tr>
<tr>
<td>SD</td>
<td>0.37</td>
</tr>
<tr>
<td>N</td>
<td>20</td>
</tr>
<tr>
<td>MAP</td>
<td>3.34</td>
</tr>
<tr>
<td>Group Leaders</td>
<td></td>
</tr>
<tr>
<td>autocratic leader</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>2.78</td>
</tr>
<tr>
<td>SD</td>
<td>0.83</td>
</tr>
<tr>
<td>N</td>
<td>9</td>
</tr>
<tr>
<td>participative leader</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3.56</td>
</tr>
<tr>
<td>SD</td>
<td>0.53</td>
</tr>
<tr>
<td>N</td>
<td>9</td>
</tr>
<tr>
<td>MAP</td>
<td>3.17</td>
</tr>
<tr>
<td>Observers</td>
<td></td>
</tr>
<tr>
<td>autocratic leader</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>2.75</td>
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<td>SD</td>
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<td>8</td>
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<td>participative leader</td>
<td></td>
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<td>M</td>
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<tr>
<td>SD</td>
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<tr>
<td>N</td>
<td>11</td>
</tr>
<tr>
<td>MAP</td>
<td>3.24</td>
</tr>
</tbody>
</table>
members' ratings.

Regression of the member-observer difference score on decision-making style and performance feedback indicated a significant interaction, \( F(2,91) = 4.10, p < .02 \). This interaction was broken down by decision-making style using the error term from the overall analysis to test the simple main effects. For ratings of leaders given autocratic decision-making instructions the effect of performance feedback on the member-observer difference score was not quite significant \( F(2,91) = 2.85, p < .08 \). The trend in means was not in the predicted direction. Group members rated the leader as more participative than the observer when given low performance feedback (\( M = .12 \)) than when given no (\( M = -.36 \)) or high (\( M = -.16 \)) performance feedback. When the leader was given participative instructions, however, there was a main effect of performance feedback (\( F(2,91) = 4.18, p < .025 \)). Post-hoc comparisons of the mean difference scores using Tukey's studentized range statistic indicated that members of groups given high performance feedback rated the group leader as more participative than the observers (\( M = 0.53 \)). There was no bias in members' ratings when their group was given low (\( M = 0.05 \)) or no performance feedback (\( M = 0.00 \)).

Hypothesis H3 predicted that performance information would bias the group members' leader ratings. Specifically, members of groups given low performance feedback should rate their leader as more autocratic than those given high or no
performance feedback. Performance feedback did influence group members' leader ratings when the leader used a participative decision-making style. As group members were only influenced by high performance feedback, however, the effect was not in the predicted direction.

**Analysis of Group Process Ratings**

Examination of the bivariate correlation coefficients between the group process variables, presented in Table 8, showed considerable intercorrelation among these measures. A principle components analysis was conducted on the set of eight group process variables in order to examine their underlying dimensionality. The analysis indicated that the eight group process variables are essentially unidimensional. The largest eigenvalue has a value of 5.37, accounting for 67% of the variance, while the next largest is 0.67 and accounts for 9% of the variance. This structure justified the use of a composite variable, created by averaging the eight group process variables. This composite was then regressed on the independent variables in testing the predictions made by hypothesis H4.

Hypothesis H4 predicted that leaders and members of groups given low performance feedback would rate their group process lower than subjects from groups given high or no performance feedback. As group members and leaders presumably have the same implicit theories of performance
Table 8

Pearson Correlation Coefficients Among Group Process Variables, Perceived Decision Quality, and Leader Ratings

<table>
<thead>
<tr>
<th></th>
<th>GP2</th>
<th>GP3</th>
<th>GP4</th>
<th>GP5</th>
<th>GP6</th>
<th>GP7</th>
<th>GP8</th>
<th>PDQ</th>
<th>LR</th>
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<td>.72**</td>
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<td>.68**</td>
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<td>GP3</td>
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<td>.54**</td>
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<td></td>
</tr>
<tr>
<td><strong>Commitment</strong></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>GP8</td>
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<td>.24**</td>
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</tr>
<tr>
<td><strong>Decision</strong></td>
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<td></td>
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<td></td>
<td></td>
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<td>Quality</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PDQ</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p<.05  
** p<.01
with regard to group process, role perspective is not predicted to influence the effect of performance feedback on ratings of these variables. In addition, only ratings of group members and leaders are expected to exhibit the performance cue effect. The observers, therefore, will be excluded from further analyses.

Regressing the composite of group process variables on role perspective, performance feedback, and decision-making style yielded no significant main effects or interactions with role perspective. As a result the data from leaders and group members were pooled in testing the predictions of hypothesis H4. Regression of the group process composite on performance feedback and decision-making style are presented in Table 9. There was a main effect of decision-making style on the group process variables. The effect of performance feedback, however, did not reach significance.

Table 9
Regression of Group Process Composite on Performance Feedback and Decision-Making Style

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Cue</td>
<td>2.98</td>
<td>2</td>
<td>2.32</td>
<td>.10</td>
</tr>
<tr>
<td>D-M Style</td>
<td>4.91</td>
<td>1</td>
<td>7.66</td>
<td>.006</td>
</tr>
<tr>
<td>Style * Cue</td>
<td>1.34</td>
<td>2</td>
<td>1.04</td>
<td>.36</td>
</tr>
<tr>
<td>Error</td>
<td>94.94</td>
<td>148</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The means for each level of instruction and the univariate F values are presented in Table 10. The trend in means suggests that improved group process is an outcome of using increased participative decision-making behavior. This conclusion seems unwarranted, however, as observers' ratings of group process variables do not show the same pattern of results. When regressing the observers' group process composite on decision-making style and performance feedback there are no significant effects of decision-making style, $F(1, 47) = 1.93$, ns. In addition, if the group process variables is regressed on perceived decision quality and decision-making style, decision-making style accounts for no unique variance ($F(1, 150) < 1$, ns). Results of this analysis indicate a strong main effect of perceived decision quality $F(1, 150) = 37.30$, $p < .0001$. These results argue that the relationship between decision-making style and group process variables arises from implicit theories of group process variables and participation in decision-making.

Although the effect of performance feedback on group process ratings was not significant, inspection of the means may help reconcile this result with prior expectations. Mean group process ratings for the group process composite and the individual variables, at each level of performance feedback, are presented in Table 11 along with univariate F values for the effect of performance feedback. In general, groups given low performance feedback rated their group process lower than
Table 10
Group Process Variable Means & Univariate F Values for Each Level of Decision-Making Style

<table>
<thead>
<tr>
<th>Decision-Making Style</th>
<th>Autocratic</th>
<th>Participative</th>
<th>F Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Process Composite</td>
<td>4.43</td>
<td>4.79</td>
<td>8.52**</td>
</tr>
<tr>
<td>Communication Quality</td>
<td>4.58</td>
<td>4.96</td>
<td>5.54*</td>
</tr>
<tr>
<td>Effort of Members</td>
<td>4.73</td>
<td>4.96</td>
<td>1.93</td>
</tr>
<tr>
<td>Coordination of Actions</td>
<td>4.12</td>
<td>4.76</td>
<td>17.37**</td>
</tr>
<tr>
<td>Team Spirit</td>
<td>4.12</td>
<td>4.54</td>
<td>5.64*</td>
</tr>
<tr>
<td>Communication Quantity</td>
<td>4.51</td>
<td>4.84</td>
<td>3.48</td>
</tr>
<tr>
<td>Interest in Performance</td>
<td>4.56</td>
<td>4.79</td>
<td>2.30</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>4.31</td>
<td>4.61</td>
<td>3.88*</td>
</tr>
<tr>
<td>Commitment</td>
<td>4.49</td>
<td>4.83</td>
<td>5.57*</td>
</tr>
</tbody>
</table>

Scale values: 1 (very low) to 6 (very high)

* p<0.05
** p<0.01

groups given high or no performance feedback. Although the specific predictions of hypothesis H4 were not supported, the trends are consistent with studies reported in the literature (Staw, 1975; Downey et al., 1979; Binning & Lord, 1980; McElroy & Downey, 1982). Given the strong relationship between perceived decision quality and performance feedback
(\epsilon^2 = .17), however, it is surprising that performance feedback did not directly influence group process ratings. It would appear, therefore, that although subjects' perceptions of their group process are strongly linked to perceived performance other factors are influencing those ratings.

Table 11

Group Process Variable Means and Univariate F Values at each Level of Performance Feedback

<table>
<thead>
<tr>
<th>Variable</th>
<th>Low</th>
<th>Control</th>
<th>High</th>
<th>F Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Process Composite</td>
<td>4.45</td>
<td>4.64</td>
<td>4.74</td>
<td>2.32</td>
</tr>
<tr>
<td>Communication Quality</td>
<td>4.59</td>
<td>4.80</td>
<td>4.94</td>
<td>2.13</td>
</tr>
<tr>
<td>Effort of Members</td>
<td>4.71</td>
<td>4.98</td>
<td>4.88</td>
<td>1.29</td>
</tr>
<tr>
<td>Coordination of Actions</td>
<td>4.33</td>
<td>4.41</td>
<td>4.58</td>
<td>1.37</td>
</tr>
<tr>
<td>Team Spirit</td>
<td>4.21</td>
<td>4.23</td>
<td>4.54</td>
<td>1.72</td>
</tr>
<tr>
<td>Communication Quantity</td>
<td>4.50</td>
<td>4.68</td>
<td>4.87</td>
<td>1.63</td>
</tr>
<tr>
<td>Interest in Performance</td>
<td>4.48</td>
<td>4.73</td>
<td>4.85</td>
<td>2.15</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>4.36</td>
<td>4.50</td>
<td>4.52</td>
<td>0.65</td>
</tr>
<tr>
<td>Commitment</td>
<td>4.43</td>
<td>4.82</td>
<td>4.77</td>
<td>3.47*</td>
</tr>
</tbody>
</table>

Scale values: 1 (very low) to 6 (very high)

* p<0.05
Group process ratings may have been influenced by having just rated the decision-making style used by the leader. The results presented earlier do indicate that group process variables may be implicitly linked with the leader's decision-making behavior. Indeed, as illustrated by the bivariate correlation coefficients reported in Table 8, leader ratings are positively correlated with all of the group process variables measured in this experiment. Correlations between the group process composite, perceived decision quality, leader ratings, and subjects' theories of effective and ineffective leader behavior are presented in Table 12. The correlations of leader rating and theories of effective and ineffective performance with the group process composite are .26, .20, and -.15 respectively. These values indicate that subjects rating the leaders' behavior as more participative tended to rate their group process higher. Further, if participative behavior was seen as leading to more effective outcomes, ratings of group process were higher.

Consistent with these correlations, regressing the group process composite on leader ratings and performance feedback shows only a main effect of leader rating (F(1,145)=5.64, p<.02). In addition, although observers' ratings of group process were not related to leader decision-making instructions, their group process ratings were related to the ratings of decision-making behavior, F(1,53)=18.36, p<.0001.
Table 12
Pearson Correlation Coefficients Among Group Process Composite, Perceived Decision Quality, Leader Ratings, and Implicit Leader Theories

<table>
<thead>
<tr>
<th></th>
<th>GP</th>
<th>PDQ</th>
<th>LR</th>
<th>Eff</th>
<th>Ineff</th>
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</thead>
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</tr>
<tr>
<td>Composite GP</td>
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<td>.20**</td>
<td>-.15*</td>
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<td>.05</td>
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<td>-.06</td>
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<td>.33**</td>
<td>-.31**</td>
<td></td>
</tr>
<tr>
<td>Effective Leader Behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.70**</td>
</tr>
<tr>
<td>Eff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ineffective Leader</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior Ineff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p<.05
** p<.01

These results indicate that the group process ratings are influenced by having rated the leaders' decision-making behavior.

In order to determine whether leader ratings could influence group process ratings independently of the effects of perceived decision quality additional analyses were performed. Table 13 depicts results from the hierarchical regression of the group process composite on leader rating and perceived decision quality. The results show main effects for both ratings of leaders' decision-making behavior and perceived
decision quality. Entering perceived decision quality into the hierarchical analysis first, however, reduces the effect of leader rating to nonsignificance. This pattern of results supports a model in which both performance feedback and ratings of the leaders' decision-making behavior contributed to ratings of perceived decision quality. Indeed, as exhibited in Table 14, both variables accounted for significant variance in subjects' ratings of perceived decision quality. As perceived decision quality is indicative of the groups' performance level, it then influenced ratings of group process variables. Therefore, in this experiment it appears subjects relied on both the performance feedback and the leaders' decision-making behavior in making their group process ratings.

Table 13
Hierarchical Regression of Group Process Composite on Leader Ratings and Perceived Decision Quality

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader Rating</td>
<td>3.12</td>
<td>1</td>
<td>7.00**</td>
</tr>
<tr>
<td>Perceiv Dec Qual</td>
<td>34.97</td>
<td>1</td>
<td>78.40**</td>
</tr>
<tr>
<td>LR * PDQ</td>
<td>0.00</td>
<td>1</td>
<td>0.00</td>
</tr>
<tr>
<td>Error</td>
<td>65.56</td>
<td>147</td>
<td></td>
</tr>
</tbody>
</table>

** p<0.01
Table 14

Regression of Perceived Decision Quality on Performance Feedback and Leader Rating

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Cue</td>
<td>8.82</td>
<td>2</td>
<td>3.90*</td>
</tr>
<tr>
<td>Leader Rating</td>
<td>25.83</td>
<td>1</td>
<td>22.82**</td>
</tr>
<tr>
<td>LR * Cue</td>
<td>2.33</td>
<td>1</td>
<td>1.03</td>
</tr>
<tr>
<td>Error</td>
<td>164.11</td>
<td>145</td>
<td></td>
</tr>
</tbody>
</table>

* p<0.05
** p<0.01
Discussion

A primary purpose of this study was to investigate whether the format for rating leader decision-making behavior used by Vroom & Jago (1978), in validating the Vroom-Yetton model, is susceptible to bias from performance information. The study used the same behavioral rating format as used in prior research on the Vroom-Yetton model in order to assess the degree to which conclusions based on self reports of decision-making behavior are biased due to knowledge of the group's performance. Further, the study has attempted to provide additional support for the theoretical position that knowledge of group performance biases ratings toward consistency with subjects' implicit theories of performance.

Previous studies have reported the performance cue effect on ratings of both group process and leadership variables. These studies have been similar in that they made consistent assumptions regarding the structure of subjects' implicit theories of performance with respect to these variables. In all cases, greater use of the rated variable is assumed to be associated with greater group performance. Another similarity in previous research on leadership scales is the use of evaluative rating scales versus descriptive ones requiring subjects to judge whether specific behaviors were observed.

This study has sought to extend previous research in a number of important ways. First, would performance feedback
bias ratings toward consistency with subjects' implicit theories of performance when there were individual differences in those theories. If variations in subjects' implicit theories of performance are able to account for significant variance in subjects' ratings the theoretical mechanism explaining the performance cue effect would garner additional support. Second, results of Guzzo et al. (1986) have indicated that while evaluative ratings are influenced by performance information descriptive ratings are not. It is not clear, however, that the descriptive items used in their study were causally linked to group performance through subjects' implicit theories of performance. Indeed, Martell & Guzzo (in press) found that descriptive scales of group behavior, implicitly linked to performance, were susceptible to bias. This study has included descriptive rating items of leader behavior that are implicitly tied to group performance. Finally, this study is unique in that previous studies reporting the performance cue effect on leadership ratings have not included subjects in the role of leader making self-ratings of their behavior.

The analysis of premeasure ratings used in this study supported hypothesis H1. The results indicate that there are significant individual differences in the degree to which subjects perceive that subordinate participation in decision-making leads to effective and ineffective outcomes. Further,
subjects' ratings indicating the behavior they felt a "most effective" leader would use showed considerable agreement with self-ratings of both past behavior (Vroom & Jago, 1978) and behavioral intent (Hill & Schmitt, 1977). This result raises the possibility that ratings made in previous studies are reflective of subjects' underlying theories of effective performance and not indicative of the behavior they did or would use.

Analysis of the premeasure data also showed that subjects differentiate between the behavior a "most effective" and "least effective" leader would use in each situation. In general, the "most effective" leader was rated as more participative than the "least effective" leader. Subjects also relied on situational attributes to a greater extent in making their ratings of the "most effective" leader. Thus it appears the structure of subjects' implicit theory of participation is more differentiated with respect to situational attributes when leading to effective performance than when leading to ineffective performance. Further, subjects' ratings of the "least effective" leader showed less than chance level agreement with the prescriptions of the Vroom-Yetton model.

Hypothesis H2 posited that performance feedback would exhibit significant interactions with leaders' theories of both effective and ineffective performance when regressed on self-ratings of decision-making behavior. This hypothesis
was only partially supported. Performance feedback did not interact with leaders' theories of ineffective performance. Self-ratings of leaders given low performance feedback were not biased toward their theories of ineffective performance. Leaders' implicit theories of effective performance did interact with both performance feedback and decision-making style. In general, these interactions are supportive of hypothesis H2. Specifically, ratings of leaders given high performance feedback and participative leaders given no performance feedback were biased toward consistency with their theories of effective performance. In addition, self-ratings by participative leaders given low performance feedback were not influenced by their implicit theories of effective performance. The ratings of autocratic leaders given no or low performance information did not behave as expected. It is possible that manipulating leader decision-making style influenced the rating process.

The manipulation of leaders' decision-making style represents a possible limitation of this study's attempt to investigate the influence of implicit theories on self-ratings of decision-making behavior. When not given instructions regarding subordinate participation, leaders of informal groups are unlikely to use the more autocratic decision-making styles AI and AII. The desire to counter this tendency and have greater representation of decision-
making behavior justified having manipulated decision-making style in this study. It is possible, however, that by instructing leaders to behave inconsistent with their tendencies when no instructions affected how performance information influenced self-ratings. It is argued that both the inconsistent behavior and the instructions themselves would give leaders additional information beyond that provided by the performance feedback. Therefore, the ability of this study to detect the influence of performance feedback on self-ratings of decision-making behavior should be diminished, especially when the leader was given autocratic decision-making instructions. It is argued, therefore, that this study provides a conservative test for this effect.

The ability of implicit theories of effective decision-making behavior to bias raters having positive performance information is problematic for the studies previously cited as providing evidence for the validity of the Vroom–Yetton model. As Vroom and Jago (1978) asked managers to recall situations in which they had a successful outcome, they were necessarily aware of their group's performance. In recalling the behavior leading to successful outcomes it is likely that their recollections were influenced by their beliefs regarding the degree to which employee participation in decisions leads to effective outcomes. There is evidence that, when considering descriptive items on a recognition test, subjects' adopt a liberal decision criterion when the
item is consistent with their implicit theory of performance (Martell & Guzzo, in press). This mechanism is consistent with results obtained in this study.

In order to aid claims of generalizability to organizational settings, this study has tried to simulate some critical aspects of the rating process likely to be present outside of the lab. First, leaders made self-ratings of behavior from an actual exercise. Secondly, the use of a delay between participation in the group exercise and rating one's behavior not only served to theoretically heighten raters' reliance on implicit theories, but also to simulate rating demands outside the lab. This study does indicate that the possibility of bias is real.

It is important to note, however, that other factors present in organizational settings may assist raters' to accurately recall their decision-making behavior. The use of particular decision-making behaviors may result in other outcomes that assist in identifying one's behavior. For example, as a result of the leader adopting a highly participative style, a subordinate may simply attend a meeting normally missed. Employees' past history of performance when allowed to participate to a given degree in decisions may also aid rating behavior accurately. Additional research, focusing on organizational factors that facilitate rating accuracy should be conducted. Despite
Staw's (1975) admonitions, such factors may enable behavioral researchers to obtain and use correlational data with confidence.

The finding that, when given high performance feedback, leaders' theories of effective performance influence ratings of decision-making behavior, has implications beyond the Vroom-Yetton model. As previously mentioned, this study is the first to include a dependent measure for which it's been empirically shown that all subjects do not hold a "more is better" implicit theory of performance. Theoretical explanations of the performance cue effect hold that subjects use performance information in conjunction with implicit theories of performance to infer probable behavior. Only with dependent variables, exhibiting measurable between subjects variation in how their relation to performance outcomes, can one provide direct evidence of the influence of implicit theories on subsequent ratings. In showing that leaders' theories of effective performance significantly influenced leader ratings for groups given high performance feedback, this study has provided direct evidence that the performance cue effect is indeed an interaction of performance information with raters implicit theories of performance.

Hypothesis H3, regarding the influence of performance feedback on group members' ratings of the leaders' decision-making behavior was not clearly supported. Although the
manipulation of performance feedback was effective it had no effect on members' ratings of the leader's decision-making behavior. Previous research has clearly demonstrated that specific leader decision-making behavior is implicitly linked to performance outcomes. Heilman et al. (1984) reported that raters with the subordinate perspective do feel that leaders using increased participation are more competent than those using autocratic behavior. In spite of this connection, group members' ratings on a descriptive measure of leader behavior were not directly influenced by performance information.

This result provides an unexpected contrast to those just presented for leaders' self-ratings of their decision-making behavior. The influence of performance information and implicit theory of performance, on a descriptive measure of leader behavior, is influenced by role perspective. This may be due to the fact that specific leader decision-making behaviors, while readily identified by an observer, are not as clear cut to the actors themselves. For example, in deciding whether one's behavior was GII (group reaches consensus), a leader may feel that a decision had the support of the entire group when in reality it did not. Alternatively, leaders may be relying on how they intended to behave rather than their actual performance.

Further, while ratings of leaders, members, and
observers showed a strong main effect for the instructions given to the leader, the effect size was strongest for group members and weakest for the observers. This could indicate that group members' ability to recognize the leaders' decision-making style was indeed accurate. Such an interpretation is suspect, however, as members were tested ten days after the actual exercise. This delay should have increased the information processing demands of the task, making bias in the ratings more likely. Observers, on the other hand, made their ratings immediately following the exercise and without knowledge of the group's performance. It seems more likely that observers were more accurate in rating the behavior actually exhibited by the leader.

Differences in the degree to which the leaders were able to exhibit the behavior they were instructed would validate the use of member-observer difference scores to detect bias in the members ratings. Using this measure, tests indicated that high performance feedback did influence members to rate the leader as more participative than observers when the leader was instructed to behave participatively. Leader ratings of members from groups given low or no performance feedback agreed with the observers. In addition, when the leader was instructed to use an autocratic decision-making style, leader ratings by members and observers agreed for all levels of performance feedback. These results indicate that group members' ratings are only biased by high performance
information when the leader has used participative decision-making behavior.

Group members may be less accurate in identifying participative behavior than they are in identifying autocratic behavior. It may be easy to determine whether a leader asked subordinates for information then made a decision alone (AII) or consulted with subordinates on solutions before making a decision (CII). It seems reasonable to presume that these judgements could be made accurately from observations alone. To determine if the leader had shared the problem with employees and allowed the group to develop a solution acceptable to all (GII), however, may require more than observing the presence or absence of specific behaviors. In this case members may have to perceive that they and other members influenced the results and supported the final solution. Performance information may influence these judgements, and in doing so, impact the members' ratings of the leaders.

These conclusions should be treated with caution and subjected to further investigation prior to their acceptance. In addition, these results may not generalize to ratings of decision-making behavior using other formats. While the forced choice recognition test for specific behavior may be largely uninfluenced by performance information, it is unlikely the same claim could be made for other scale types.
For instance, subjects' confidence ratings regarding the behavior they observed may have been influenced by performance information.

This study was also unsuccessful in supporting the predictions made by hypothesis H4, attempting to replicate the performance cue effect on ratings of group process variables. Studies using subjects as passive observers of leader behavior have found consistent evidence for the bias due to performance cue. In addition, two of three studies, where subjects participated in the group process, found evidence for the performance cue effect. The results of the present study could be used to challenge the existence of the performance cue effect when subjects participate in the group process. However, because subjects' ratings of perceived decision quality exhibit such a strong relationship with the group process measures, this explanation seems unlikely.

Rather than conclude that group process ratings are not biased by knowledge of group performance, this study may have identified another variable capable influencing these ratings. It is certainly feasible that in addition to implicit theories of performance, subjects also possess implicit theories regarding the manner in which the level of employee participation in decisions covaries with group process variables. Implicit theories of participation could then be expected to influence evaluative ratings in much the same way as implicit theories of performance. Results from
this study support a model in which both subjects' rating of
the leader's behavior and performance feedback influenced
perceived decision quality. Thus, ratings of the leader
provided information which could then influence subsequent
group process ratings.

Feldman & Lynch (1988) presented evidence supporting the
theory that momentarily activated cognitions can influence
subsequent judgements made about an object or of related
behaviors. Rather than directly retrieving observed
information on which to base their responses to behavioral
ratings, Feldman and Lynch assert that subjects may use an
earlier response as an input to arrive at the answer to a
question. This process would be predicted to occur if the
earlier response is either accessible or perceived to be more
diagnostic than other inputs. In the present study, given
the ten day delay between observation and rating, it is
probably safe to assume that both the performance feedback
and rating of the leader's behavior were more accessible than
behaviors indicative of group process. Without objective
group process ratings, however, this data cannot discern
between this hypothesis and rating differences arising due to
ture differences in behavior. In any event, researchers
should be alert to the potential influence of ratings of
decision-making behavior generating correlations reflective
of perceived relationships.
References


APPENDIX A

Autocratic Leader Instructions

Your role is to act as the leader of the group as it completes the problem described below. It is important that you follow the enclosed instructions as closely as possible during the exercise. However, at no time are you to tell the group members or the observer the specific instructions you are following. The observer of your group is not to interact with the group at all. There is only one correct answer to this problem.

You are a department head at the Hi-Tech Corporation. Your department is responsible for the development of management information system software programs for use in business and governmental organizations. Hi-Tech is a successful computer software development company with a strong reputation for its innovative products. Due to the increasing number of competitors and the improved quality of the competition’s products, the management of Hi-Tech has recently become concerned with maintaining the company’s position in the market and state-of-the-art software development.

In order to provide personal incentive in support of its commitment to excellence, Hi-Tech has decided to replace its policy of giving across-the-board pay increases with a merit pay system.
You must submit a ranking of your employees on the basis of merit to used as a major factor in assigning salary increases. Eight salaried employees report to you. Descriptions and data about these staff members are provided.

In addition, as part of Hi-Tech's succession planning efforts, you must also submit a ranking of the employees for promotion to department head.

In order to insure employee acceptance of this new method for rewarding employees, two members of another Division within Hi-Tech are here to assist you in developing these rankings. The group members are to provide input to you for you to use in making the decision. However:

* You will make the actual rankings of the employees.

* In developing your answer to this problem use the group members to help you develop the standards by which you make your ratings.

* Ask them what criteria should be used in promoting an employee to management or in recommending employees for merit raises.

* Do not ask them for specific ratings of your employees.

* This is to be your decision.

* When you feel you have the necessary information on which to base your ratings then mark them on the enclosed form.

* Do not discuss your role with the group members or observer.

You are then to collect all materials from the group members and return them to the course instructor. Your rankings will be scored and discussed at a later date.
Participative Leader Instructions
(To be read silently)

Your role is to act as the leader of the group as it completes the problem described below. It is important that you follow the enclosed instructions as closely as possible during the exercise. However, at no time are you to tell the group members or the observer the specific instructions you are following. The observer of your group is not to interact with the group at all. There is only one correct answer to this problem.

You are a department head at the Hi-Tech Corporation. Your department is responsible for the development of management information system software programs for use in business and governmental organizations. Hi-Tech is a successful computer software development company with a strong reputation for it's innovative products. Due to the increasing number of competitors and the improved quality of the competition's products, the management of Hi-Tech has recently become concerned with maintaining the company's position in the market and state-of-the-art software development.

In order to provide personal incentive in support of its commitment to excellence, Hi-Tech has decided to replace it's policy of giving across-the-board pay increases with a merit pay system.
You must submit a ranking of your employees on the basis of merit to used as a major factor in assigning salary increases. Eight salaried employees report to you. Descriptions and data about these staff members are provided.

In addition, as part of Hi-Tech's succession planning efforts, you must also submit a ranking of the employees for promotion to department head.

In order to insure employee acceptance of this new method for rewarding employees, two members of another Division within Hi-Tech are here to assist you in developing these rankings. The group members are to provide input to you for you to use in making the decision. However:

* The decision is your responsibility.

* Try to develop ratings that are acceptable to all of the group members.

* When you have the necessary information on which to base your groups' ratings, mark them on the enclosed form.

* Do not discuss your role with the group members or observer.

You are then to collect all materials from the group members and return them to the course instructor. Your rankings will be scored and discussed at a later date.
Group Member Instructions
(To be read silently)

Your role is to act as a member of the group as it completes the problem described below. The leader for your group will administer the solving of the problem. It is important that you adhere to the following directions. There is only one correct answer to this problem.

The group leader is a department head at the Hi-Tech Corporation. His department is responsible for the development of management information system software programs for use in business and governmental organizations. Hi-Tech is a successful computer software development company with a strong reputation for its innovative products. Due to the increasing number of competitors and the improved quality of the competition's products, the management of Hi-Tech has recently become concerned with maintaining the company's position in the market and state-of-the-art software development.

In order to provide personal incentive in support of its commitment to excellence, Hi-Tech has decided to replace its policy of giving across-the-board pay increases with a merit pay system.

The group leader must submit a ranking of the employees on the basis of merit to used as a major factor in assigning salary increases. Eight salaried employees report to this
leader. Descriptions and data about these staff members are provided.

In addition, as part of Hi-Tech's succession planning efforts, the leader must also submit a ranking of the employees for promotion to department head.

In order to insure effective implementation of its new reward policy, employee representation from other divisions is being solicited. Your group has been assembled today to assist the leader making these rankings. You and the other member of your group are salaried employees from the marketing and financial management divisions of Hi-Tech. Your level in the organization is the same as that of the people who the manager must rank order.

After the group has completed the problem give your instructions back to the group leader, who will turn them into the instructor. The results of your group's rankings will be scored and discussed at a later date.
APPENDIX B

Observer Instructions & Rating Form

(To be read silently)

Your role is to act as a non-interacting observer of the group as it completes the problem described below. It is important that you do not assist the group in any way as they work on the problem or tell them what behaviors you will be observing. After the group has completed the task you will indicate the decision-making style that you observed the leader use in the problem. Descriptions of the decision-making styles are included on the next page. Read these descriptions before the group begins working on the problem. However, do so silently. Finally, after the exercise, do not tell any of the group members the ratings you have made. Their results will be computed and returned to them at a later date. At that time there will be time to discuss the observed behavior and the group's performance. They should not know how you have rated the leader's behavior during the problem or even what behavior you are to measure. This is extremely important.

The group leader is a department head at the Hi-Tech Corporation. His department is responsible for the development of management information system software
programs for use in business and governmental organizations. Hi-Tech is a successful computer software development company with a strong reputation for its innovative products. Due to the increasing number of competitors and the improved quality of the competition's products, the management of Hi-Tech has recently become concerned with maintaining the company's position in the market and state-of-the-art software development.

In order to provide personal incentive in support of its commitment to excellence, Hi-Tech has decided to replace its policy of giving across-the-board pay increases with a merit pay system.

The group leader must submit a ranking of the employees on the basis of merit to used as a major factor in assigning salary increases. Eight salaried employees report to this leader. Descriptions and data about these staff members are provided.

In addition, as part of Hi-Tech's succession planning efforts, the group leader must also submit a ranking of the employees for promotion as the next department head.

This group has been assembled to assist the leader in making these rankings. The group members are salaried employees (not managers) from another division in Hi-Tech.
TYPES OF LEADER DECISION-MAKING STYLES

I  The leader solves the problem or makes the decision alone, with no input from subordinates, using information available at the time.

II  The leader obtains the information necessary to make a decision from the subordinates, then makes the decision alone. The leader may or may not tell the subordinates what the problem situation is in getting information from them. The subordinates are providing information to the leader, not generating or evaluating alternative solutions.

III  The leader shares the problem with the subordinates together, as a group, collectively obtaining their ideas and suggestions. The leader then makes the decision, which may or may not reflect the opinions of the subordinates.

IV  The leader shares the problem with the subordinates as a group. Together they generate and evaluate alternative and attempt to reach consensus on a solution. The leader acts as a chairperson, not trying to influence the group to adopt a particular solution and willing to accept and implement any solution which has the support of the entire group.

Which decision-making style was used by the group leader during this exercise? (circle one)

I  II  III  IV
How would you rate the quality of communication in the group during the exercise?

Very Low 1 2 3 4 5 6

Very High

How would you rate the effort put into the task by group members?

Very Low 1 2 3 4 5 6

Very High

To what extent were the actions of the group members coordinated?

Not At All 1 2 3 4 5 6

To a Great Extent

How would you rate the team spirit of the group?

Very Low 1 2 3 4 5 6

Very High

How would you rate the quantity of communication in the group during the exercise?

Very Low 1 2 3 4 5 6

Very High

To what extent did the group appear interested in performing well?

Not At All 1 2 3 4 5 6

To a Great Extent

To what extent did people in the group appear to enjoy working together?

Not At All 1 2 3 4 5 6

To a Great Extent
To what extent was the group committed to accomplishing its task?

Not At All

1 2 3 4 5 6

To a Great Extent

How would you describe the quality of the group's rankings?

Very Low

1 2 3 4 5 6

Very High
APPENDIX C
Leader Rating & Feedback Form

The decision-making problem you completed was developed by Paul Hersey and Kenneth Blanchard, developers of the Situational Leadership theory. Your score was determined by taking the differences between your rankings and those of the experts. Your group’s performance on this decision-making problem, as compared to norms published by Hersey and Blanchard was:

<table>
<thead>
<tr>
<th>Well</th>
<th>Below</th>
<th>Above</th>
<th>Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below Avg</td>
<td>Avg</td>
<td>Average</td>
<td>Above Avg</td>
</tr>
</tbody>
</table>

Please carefully read the following descriptions of decision-making behaviors, then indicate which of the four best describes your behavior as you made the rankings of "Hi-Tech" employees during last week’s exercise.

A  You shared the problem with the group members. You had them generate and evaluate alternatives while attempting to reach consensus on the employee rankings. You acted as a chairperson, and accepted the set of employee rankings which had the support of the entire group.

B  You developed the employee rankings alone, with no input from the group members, using information available at the time.

C  You obtained information to make the rankings from the group members, however, the group members did not generate or evaluate alternative rankings of the employees. You made the rankings alone.

D  You shared the problem with the group members, obtaining their ideas and suggestions as to the proper ranking of the employees. However, you made the decision, which may or may not have reflected the opinions of the group members.

Which decision-making style best fits your behavior during this exercise? (circle one)

A  B  C  D
Now, please indicate which of the following situational attributes were characteristic of your group during the exercise:

(circle either yes or no)

There was a quality requirement such that one set of employee rankings was more accurate than another.

YES                  NO

You had sufficient information to make a quality decision alone.

YES                  NO

The problem was structured.

YES                  NO

Acceptance of the decision by your group members was critical to implementation.

YES                  NO

Group members would have accepted a decision made by the leader alone.

YES                  NO

Group members shared the goal of developing quality rankings in solving this problem.

YES                  NO
How would you rate the quality of communication in the group during the exercise?

Very Low  1  2  3  4  5  Very High  6

How would you rate the effort put into the task by group members?

Very Low  1  2  3  4  5  Very High  6

To what extent were the actions of the group members coordinated?

Not At All  1  2  3  4  5  To a Great Extent  6

How would rate the team spirit of the group?

Very Low  1  2  3  4  5  Very High  6

How would you rate the quantity of communication in the group during the exercise?

Very Low  1  2  3  4  5  Very High  6

To what extent did the group appear interested in performing well?

Not At All  1  2  3  4  5  To a Great Extent  6

To what extent did people in the group appear to enjoy working together?

Not At All  1  2  3  4  5  To a Great Extent  6
To what extent was the group committed to accomplishing its task?

Not At All

1 2 3 4 5 6

To a Great Extent

How would you describe the quality of the group's rankings?

Very Low

1 2 3 4 5 6

Very High