Technical Report 506

A DYADIC INTERACTIVE APPROACH TO THE STUDY OF LEADER BEHAVIOR

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Eighty male college students assigned roles as supervisors and workers performed experimental tasks in a study that focused on (1) the degree of leader-follower compatibility, (2) Vertical Dyad Linkage (VDL) versus the Average Leadership Style (ALS) analysis of leader behavior, and (3) the general problem of assessing leader behavior on the basis of subordinate description. Results indicated that compatibility in the leader-member dyad appears to be an important element in the group setting. It is related
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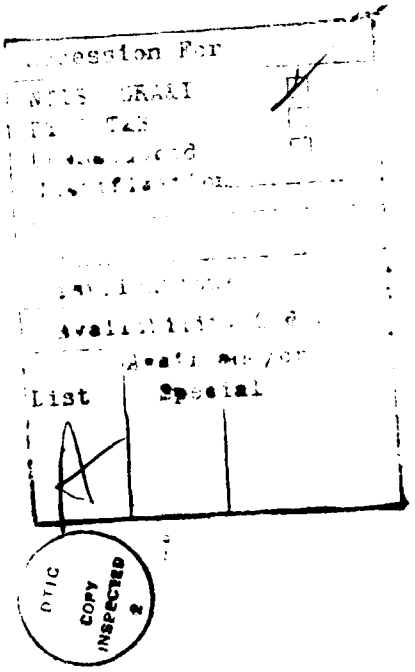
to performance rating satisfaction and the leader behaviors perceived by group members. However, the strength of the observed relationships must be tempered by the post hoc nature of the compatibility measure. Moderate statistical support was shown for the superiority of the VDL approach to understanding leader behavior effects on member responses. The data also demonstrated that individual members of the group do not provide valid ratings of the leaders' behavior toward individual subordinates.



Technical Report 506

A DYADIC, INTERACTIVE APPROACH TO THE STUDY OF LEADER BEHAVIOR

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FOREWORD

The Leadership and Management Technical Area of the Army Research Institute (ARI) is involved in developing and applying social science research methodology to improve the effectiveness of Army management.

The following report is part of the research project of the OE Technology Development Unit. This research examined leader behavior while assessing the interactive effects of leader characteristics, follower characteristics, and the task situation. The results of this research will be incorporated in leadership training models currently being developed at Army Research Institute.

This report was prepared under Project 2Q161102B74F with Purdue University and was sponsored by the U.S. Army Research Institute.

JOSEPH ZEIDNER
Technical Director

A DYADIC INTERACTIVE APPROACH TO THE STUDY OF LEADER BEHAVIOR

BRIEF

Requirement:

To assess the interactive effects of leader characteristics, follower characteristics, and the task situation on leader behavior. The investigation focuses on (1) the degree of compatibility between the leader and his followers, (2) Vertical Dyad Linkage (VDL) versus the Average Leadership Style (ALS) analysis of leader behavior, and (3) the general problem of assessing leader behavior on the basis of subordinate description.

Procedure:

Eighty male college students who were assigned roles as supervisors and workers in a bogus greeting card company performed experimental tasks involving construction of "origami" cranes. The following variables were considered: (1) leader-follower compatibility (dominance-based), (2) degree of interfollower cooperation, (3) degree of follower task experience.

Subjects were divided into 15 work groups in which low-moderate-high leader-follower compatibility was attained, based on post hoc assessment of interpersonal attraction. Measures of leader behavior, follower performance, and job satisfaction were obtained, together with measures of attitude similarity. Leader behavior was also recorded by two external observers utilizing Leader Behavior Coding Sheets (LBCS). The major hypotheses were tested in accordance with a 2 x 2 x 3 post hoc design which used cooperation condition, task experience, and compatibility (based on interpersonal attraction) as the respective factors.

Findings:

The results indicated that increased performance was related to increases in the degree of compatibility between the followers and the leaders only when subjective estimates of performance from the leader were used. Objective performance did not relate to compatibility. The data strongly supported the hypothesis that leader-follower compatibility is related to follower satisfaction with several facets of the work environment.

The data offered moderate statistical support for the superiority of the VDL approach to the understanding of leader behavior effects on member/group responses.

The study demonstrated that descriptions of leader behavior by individual members of the group generally do not provide valid ratings of the leader's behavior toward individual subordinates, i.e., leader behavior

descriptions obtained from individual members did not correlate with observer ratings, though those correlated highly with one another.

Utilization of Findings:

The results of this study indicate the need to record "actual" leader behavior rather than relying on subordinate perceptions. It also stresses the need for multiple observations of dyadic leader/member behaviors to obtain more valid measures of leader behavior. These results will be incorporated in leadership training models currently being developed at Army Research Institute (ARI).

A DYADIC INTERACTIVE APPROACH TO THE STUDY OF LEADER BEHAVIOR

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INTRODUCTION

This report describes the results of a study designed to assess and relate critical leader, group member, and situational characteristics to leader behavior. It has long been recognized that leader effectiveness depends upon the amalgamation of the leader, his specific group members, and the situation in which they find themselves; yet few theories outside of Fiedler's Contingency Model have attempted to deal with all three facets simultaneously. This study reviewed the literature, selected key variables from each of the three domains based upon the review, and measured the influence of these variables on leader effectiveness in a controlled setting. Effectiveness was based upon group member productivity and satisfactions. The results were analyzed in such a way as to permit the comparison of the leader's influence on the average group effectiveness and his influence on the effectiveness of each individual member.

Statement of the Problem

Through history and continuing into the present, there has been considerable interest in the phenomenon and problems of leadership. This is especially true during periods of national and international crises when the subject of leadership inevitably becomes an issue of central concern. In general, most people think of leadership in terms of outstanding personal qualities that are found in certain individuals. Furthermore, people implicitly assume that a "great man" will be able to rally and unite a group of citizens into a cohesive body and direct the group's actions toward the successful resolution of mutual problems or the attainment of common goals.

Because of this prevalent notion of leadership, the public has accepted the belief that, when guided by an inspirational and dynamic leader, the members of a group will be able to control a part of their destiny. As a consequence, there has been intense interest in leadership and a plethora of leadership studies. In reviewing the voluminous findings, it is best to consider the results in terms of three basic approaches that have been taken.

The first approach, the trait approach, assumed that leadership was primarily a function of the leader. Thus, it was involved with the search for a set of individual traits that would differentiate leaders from non-leaders. Unfortunately, the numerous studies on the personalities of leaders failed to find any consistent pattern of traits which would permit the identification of leaders. Also, the correlations between individual traits and group effectiveness measures were of such low order, i.e., .10 to .20, that the usefulness of the findings as a basis for selecting leaders or for developing a general theory of leadership was very limited.

The second approach, the situational approach, was based upon the assumption that any person who was in the right place at the right time would emerge as the leader. In particular, this approach concentrated upon the

interpersonal relations within the group, the characteristics of the total culture in which the group existed, and the physical conditions and the nature of the task that confronted the group. The findings from this approach showed that as the situation changed, different roles became leadership roles, and because individual differences are relatively stable over time, different persons were most likely to fill the leadership role. However, the findings were not consistent as there were some situations where changes did not result in a different person assuming the leadership role. At times, the leader was able to modify his behavior sufficiently to retain his leadership role. Thus, instead of consistently supporting the situational hypothesis, the findings led to the realization that the underlying leadership processes were much more complex than had been originally assumed.

The third or behavioral approach focused upon the behavioral styles of the leaders. After many studies, styles that were similar to the Ohio State Styles of Consideration and Initiation of Structure emerged as the major dimensions of leadership behavior. Unfortunately, the situational characteristics could and did moderate the relationships between leader behaviors and criterion measures. As a result, researchers were not able to specify consistent relationships between leader behaviors and leadership outcomes.

In summary, all of the basic approaches did not result in major advances in the understanding of the leadership phenomenon. However, they did contribute toward the acceptance of the complex nature of the phenomenon. This, in turn, led contemporary investigators to conclude that leadership research must be able to explain the effects of the interactions between the characteristics of the leader, the followers, and the situation, upon pertinent leader behaviors.

Purposes of the Study

The present study was conducted for three primary purposes. First, it was designed (a) to gather empirical data about the complex relations and interactions between the leader, the followers, and the situational variables; and (b) to determine how combinations of these variables influence two common leadership outcomes--follower performance and follower satisfaction.

Second, the study was undertaken so a comparison could be made between the traditional Average Leadership Style (ALS) and the recently proposed Vertical Dyad Linkage (VDL) approaches, both of which are used as strategies to analyze the data of leadership studies. The ALS approach assumes that the leader possesses a stable style and that any unique relationships between the leader and one or more specific followers merely produces error in the assessment of his style. As a result, the leader's style is operationalized in terms of the average of the descriptions from each follower. In contrast, the VDL approach (Graen, Dansereau, & Minami, 1972) assumes that the unique relationships between the leader and each of his followers contains valid information about the leader's behavior. Therefore, the follower's description of his leader's behavior is not averaged into an overall estimate of the leader's style. The present study's experimental procedures were carefully tailored so the resulting data would permit an objective appraisal of each approach.

Third, the study was conducted to determine the effects of different operationalizations of leader behavioral styles. Specifically, measures of leader behaviors were to be obtained from the followers and from external observers to determine whether leadership styles from different sources would result in different findings.

In conjunction with a review of the empirical literature that is germane to the current study, the major hypotheses to be tested will be stated and developed in the following section.

REVIEW OF THE LITERATURE

Interaction and Contingency Theories

In spite of the intensive research efforts that were stimulated by the "great man" or trait theories, the situational theories, and the behavioral theories, the understanding of leadership processes has remained rather superficial. However, leadership researchers remained undaunted and by drawing upon the positive aspects of the previous approaches they were able to formulate a new conceptualization that is referred to as interaction theory or contingency theory. The need for and the fundamental aspects of this new approach were best expressed by Gibb who wrote (1969, p. 268):

> Any comprehensive theory of leadership must incorporate and integrate all the major variables which are now known to be involved, namely, (1) the personality of the leader, (2) the followers, with their attitudes, needs, and problems, (3) the group itself, as regards both (a) structure of interpersonal relations and (b) syntality characteristics and (4) the situation as determined by physical setting, nature of task, etc.

Of many contemporary models, Fiedler's Contingency Theory of Leadership Effectiveness (Fiedler, 1967; Fiedler & Chemers, 1974) comes closest to meeting Gibb's goal. This model focuses upon the interaction of personality and situational determinants of leader behavior. The Least Preferred Coworker (LPC) score is used to represent the relevant personality attribute of the leader. Those who score low on this scale, low-LPC's, are said to prefer to concentrate upon the task to accomplish group goals, while the preferred style of high LPC's, on the other hand, is to concentrate on interpersonal factors. Situational determinants are described as those factors which affect the difficulty of the situation to the leader and are most frequently operationalized on the basis of three component dimensions: (a) the degree to which the leader feels accepted by his group, (b) the degree to which the task is structured, and (c) the degree to which the leader's position has power and influence. The majority of Fiedler's studies have found that low-LPC leaders tend to perform better in very favorable as well as very unfavorable leadership situations, while high-LPC leaders tend to perform better in situations which are intermediate in favorableness (Fiedler, 1973).

Despite the optimistic hopes that were once held for the interaction or contingency theories, recent reviews conclude that these theories have not produced the hoped-for break-throughs in our understanding of the

leadership phenomenon. Graen, Alvares, Orris, and Martella (1970) analyzed the contingency model of leadership effectiveness and its supporting research, and they found many problems which created doubts about the model's plausibility. They discovered that findings that were not statistically reliable were interpreted as positive support for the model. Also, when the results of the antecedent studies (those which led to the formulation of the model) were compared against the results of the evidential studies (those used to test the predictions of the model) there were significant differences within the octants that represent different degrees of situational favorableness in terms of mean correlations. In addition, Graen et al. implied that the basic research procedure used in the contingency theory studies prescribed that the data be analyzed until the results conformed to the patterns of the relations specified by the model. Another troublesome aspect of Fiedler's contingency model is the interpretation of the LPC score. Even Fiedler acknowledges that this operationalization of the leader personality variable is not clearly understood. He stated:

> The score has been difficult to interpret. While labels of "relationship-oriented" vs. "task-oriented" have been given to high vs. low LPC persons, the terms are somewhat misleading. First, only in situations which are unfavorable (that is, stressful, anxiety arousing, giving the leader little control) do we find leader behaviors which correspond to these terms (Fiedler, 1967a). Different, even opposite, behaviors tend to be seen in favorable situations.
>
> Second, Mitchell (1969) has found evidence that high LPC leaders tend to be cognitively more complex in their thinking about groups, while low LPC leaders tend to be more stereotyped. Similar results (i.e., a correlation of .35) have been reported by Schroder and his co-workers (personal communication). The LPC score must, thus, be seen as a measure which at least in part reflects the cognitive complexity of the individual and which in part reflects the motivational system that evokes relationship-oriented and task-oriented behaviors from high vs. low LPC persons in situations which are unfavorable for them as leaders (Fiedler, Note 1, p. 3).

Thus, in its present state, the Contingency Theory still is controversial. However, it has received enough support to remain viable and to offer reason to believe that future research on it may be able to more accurately explain the intricacies of leadership.

In a more general vein, Korman (1973) has identified some of the major problems that confront contingency theories. He suggested that contingency models have encountered continuing difficulty in replicating the theorized predictions because leadership researchers (a) have failed to establish the construct validity of their measures and (b) have not gathered sufficient information on the behavioral significance of the different levels of the theoretical contingency variables. In sum, he recommends that these two problems be resolved before researchers proceed with the testing of contingency hypotheses that are not supported by empirical evidence.

Despite these discouraging reviews, each intervention and contingency model has contributed valuable insights and has further instilled in

leadership researchers an awareness of the complexity of the task that faces them. At a symposium that reviewed the current developments in the study of leadership (Fleishman & Hunt, 1973), Fleishman made the following points which tend to support this conclusion and to encourage further research: He stated that (a) established concepts and measures are available; (b) situational and moderator variables have been identified; (c) interactions may be the rule rather than the exception; and (d) nonlinear relations do exist.

As a consequence of these findings, reviews, and comments, the study's first objective was to gather additional data about the complex interactions between the leader, the followers, the situation, and the leader behaviors. In addition, Stogdill's (1974) appeal for research designs on leader-follower interactions that combine variables related to leader characteristics, follower characteristics, group characteristics, and group outcomes served as an additional motivational force.

An interactive approach, similar to the integrative approach proposed by Tannenbaum and Schmidt (1958), was selected as the vehicle for attaining the first research objective. Tannenbaum and Schmidt (1958) believed that each manager (leader) had a range of possible leadership behaviors that were available for his use, and that the appropriateness of the behaviors depended upon three sets of forces: those in the manager (leader) himself, those in the manager's group members (followers or subordinates), and those in the situation. In the interest of converting Tannenbaum and Schmidt's terms to variables that have behavioral significance, the leader and follower forces were operationalized in terms of dominance and interpersonal attraction. The decision to use these interpersonal variables was due, in part, to Stogdill's conclusion after he had surveyed and analyzed more than 3,000 books and articles on leadership. He concluded:

> There is a scarcity of research that tests the interaction of leader personality, values, and behaviors with follower personality, values and behaviors and the effect of such interaction upon the group. (Stogdill, 1974, p. 422)

The decision was also due to Fleishman's (Fleishman & Hunt, 1973) statement that, "Twenty years ago the pendulum in leadership research took a sharp swing away from a view of leadership as a personality trait, but I believe it is time to revive interest in this view."

With respect to dominance, its use as an independent variable was inspired by two sources. First, after reviewing the small group literature, Shaw concluded:

> Individuals vary markedly in the extent to which they wish to be prominent in group situations, the degree to which they assert themselves as individuals, and the extent to which they wish to dominate others. All these tendencies reflect an individualistic orientation, or at least a tendency to emphasize self in contrast to submission to oblivion in the group. This general ascendant tendency is referred to variously by such terms as ascendancy, assertiveness, dominance, and individual prominence. Although each of these terms refers to a slightly different aspect of the

> ascendant predisposition, there is enough commonality to consider them as a set . . . . Persons who possess the personality characteristics associated with ascendancy generally behave as one would expect from the description of the dimension. They attempt leadership, participate in group activities, are assertive, and are creative. They tend to emerge as leaders, promote group cohesiveness, influence group decisions, conform to group norms, and are popular. They also tend to be dissatisfied with the leader--when the leader is someone else! (Shaw, 1971, pp. 175-176)

Second, Smelser (1961) found that compatible groupings based upon different combinations of dominant-submissive individuals led to more effective group action in a problem-solving situation. His compatible groups were comprised of dominant-submissive and submissive-dominant pairs, while his incompatible groupings were composed of two dominant or two submissive individuals. Smelser theorized that in the compatible groups the interacting individuals were able to use interpersonal techniques that were consistent with their predispositions. As a result, there was a reduction of anxiety and consequently, the group's performance was enhanced.

Cooperation condition was selected to represent the situational forces and was operationalized by having the followers work individually (low cooperation) or as a team (high cooperation). Due to the complexity of the experimental task, it was assumed that followers working alone would elicit a higher frequency of structuring behaviors from their leaders than followers working as a team. Also, it was further assumed that followers working as a team with assembly line procedures would be more productive than followers completing the entire task by themselves. In sum, the manner in which the followers had to perform the task (a situational variable) was assumed to have an influence upon leader behavior and productivity.

With the previously discussed findings, reviews, comments, and Tannenbaum and Schmidt's model in mind, the following hypotheses are made:

1. Hypotheses relevant to the interactive approach to leadership:

   a. <u>The greater the degree of leader-follower compatibility, the greater the follower's performance</u>.

   b. <u>The greater the degree of leader-follower compatibility, the greater the follower's job satisfaction</u>. Like the first hypothesis, this one is based upon an extrapolation from Smelser's (1961) findings and theorizing.

   c. <u>Different degrees of leader-follower compatibility will be associated with different levels of leader behaviors</u>.

<u>Different Research Strategies for Data Analyses</u>

In addition to their different theoretical conceptualizations of the leadership phenomenon, the various approaches may be differentiated on the basis of the assumptions each makes with respect to their strategy for data analysis. Nearly all of the past approaches to the study of leadership in

formal organizations, e.g., Blake and Mouton (1964), Likert (1961), and Stogdill and Coons (1957) have assumed that the leader treated all of his subordinates in essentially the same manner, and that the subordinates, likewise, reacted to the leader's behaviors in essentially the same manner. Graen and his associates (Graen, Dansereau, & Minami, 1972) have categorized these approaches as using an Average Leadership Style (ALS) model. As an alternative data analysis strategy, they proposed a Vertical Dyad Linkage (VDL) model which views the particular relationships between the leader and each of his individual members as the basic unit of analysis. The differences in the assumptions associated with the ALS and the VDL models (Graen, Dansereau, & Minami, 1972; Dansereau, Cashman, & Graen, 1973) are summarized in Table 1. In support of their contention that the VDL model provides a more appropriate research strategy than the ALS model, Graen and his associates cite studies by Evans (1970) and Graham (1970) in which the results failed to support the traditional ALS assumptions. Briefly, according to the ALS model, there should have been considerable agreement between the superior and his members (as a group) in describing the behaviors of the superior. However, in both studies the agreement between the description of the leader's Consideration and Initiation of Structure behaviors that were obtained from the leaders, and the description of the same behaviors that were obtained by averaging the responses from the members under the leader in question was close to zero.

In an effort to demonstrate the possible advantages of the VDL approach, Dansereau, Cashman, and Graen (1973) compared the extent to which the VDL and the ALS models were able to account for empirical relationships between leadership styles and turnover among managers. They concluded:

> These studies show that this VDL approach reveals orderliness in the data that the average leadership style approach would have assumed <u>a priori</u> to be mainly error variance. On the other hand, the orderliness revealed by the VDL approach could not have been extracted from the data using the ALS approach. (p. 197)

On the basis of these findings, a second research objective was to design the study so that the resultant data would permit a comparison of the ALS and the VDL approaches.

Although the following points are not discussed in terms of the VDL approach per se, they are closely related to the basic assumptions of the VDL model. Therefore, they will be used as sources for developing hypotheses that are related to the attainment of the second research objective. The first point is Tannenbaum and Schmidt's (1958) suggestion that a leader is capable of manifesting a range of behaviors. They stated the leader must be sensitive to the various demands of different settings and different subordinates and that:

> The successful leader is one who is able to behave appropriately in the light of these perceptions. If direction is in order, he is able to direct; if considerable participative freedom is called for he is able to provide such freedom. Thus, the successful manager of men can be primarily characterized neither as a strong leader nor as a permissive one. Rather, he is one who maintains a high batting average in accurately assessing the forces that

Table 1

Assumptions of Models[a]

Average Leadership Style (ALS)	Vertical Dyad Linkage (VDL)
1. The behavior of the leader toward his members tends to be sufficiently consistent over time and homogeneous over members, i.e., the variance in behavior around the ALS is both random and quite small over time and over members of the unit.	1. The behavior of the leader depends upon his relationship with his particular members. The behavior of the leader will be more homogeneous and consistent toward particular members than it will toward members-in-general, i.e., the variance of the leader's behavior will be smaller around the average for each particular member than around the ALS.
2. Member's perceptions, interpretations, and reactions to the leader are homogeneous or at least randomly distributed within the work unit. Thus, the deviation of the members' observations from the ALS is error to be reduced, i.e., by averaging over members, the positive bias of one member should be cancelled by the negative bias of another member.	2. Members' perceptions, interpretations, and reactions to the leader are heterogeneous. Thus, the individual members' observations contain valid variance to be analyzed.
3. Leadership style is related to unit outcomes.	3. Leadership style is related to outcomes of individual members.

[a] From Graen, Dansereau and Minami, 1972; and Dansereau, Cashman and Graen, 1973.

> determine what his most appropriate behavior at any given time should be and in actually being able to behave accordingly. Being both insightful and flexible, he is less likely to see the problems of leadership as a dilemma. (p. 101)

The second point is Hill's (1973) conclusion in a study in which he measured subordinates' perceptions of their leaders' ability to use different leadership styles. He concluded:

> The data reported in this paper suggest that managers were not perceived by their subordinates to rely solely upon one style. Although some managers were perceived to adopt a certain style for certain types of problems, a good deal of style flexibility generally was perceived by subordinates. This conclusion suggests that most leaders can behave flexibly enough to cope with varied situations. (p. 46)

In addition, Graen and his associates (Graen, Dansereau, & Minami, 1972; and Dansereau, Cashman, & Graen, 1973) further distinguish between ALS and VDL in terms of what are considered appropriate units of analysis or criteria for leader effectiveness. ALS considers only group criteria-group performance, average member satisfaction, etc. VDL, on the other hand, relates leader behavior to the performance and social-emotional responses of each individual member. It is the contention of the present study that this distinction is not a necessary difference. ALS researchers certainly would not say that individual responses are not important or of interest; VDL researchers would not deny the importance of group outputs. The difference in criteria is one of choice and not of limitations imposed by the model. Therefore, both criteria will be considered for each model in the present study.

On the basis of the previously discussed findings, the following hypotheses are made:

2. Hypotheses related to the VDL and ALS assumptions:

   a. The correlation between a leader's specific behavior and individual job performance will be higher under the VDL approach to analysis than under the ALS approach. This hypothesis assumes that the VDL approach, by treating the particular relationships between the leader and each of his followers as the basic unit of analysis, will be able to capitalize upon the variance that is contained within each group member's observation. As a result, the VDL approach is expected to yield leader behavior-job performance correlations that would not be detected by the ALS approach.

   b. The correlation between a leader's specific behavior and individual job satisfaction will be higher under the VDL approach to analysis than under the ALS approach. The reasoning behind this hypothesis is similar to Hypothesis 2a.

   c. Leaders whose consideration behaviors are homogeneous across followers will have a greater number of satisfied followers than leaders whose consideration behaviors are heterogeneous across followers.

Homogeneous behaving leaders are defined as those who tend to be concerned with the needs of all followers, equally, and who tend to display the same amount of consideration behavior toward each member, while heterogeneous leaders are defined as those who tend to spend more time being considerate to some followers than to other followers. This hypothesis was based upon the assumption that the unequal distribution of consideration across followers would be interpreted by members as a display of favoritism on the part of the leader and result in the neglected followers being less satisfied than the followers who received the greater part of the leader's consideration behaviors. This hypothesis may appear to contradict Hill's (1973) finding that "...subordinates expressed more satisfaction with their supervisors when they perceived them to have the highest degree of style flexibility, although satisfaction does not seem to increase on a linear basis." (p. 79) However, because he operationalized leadership style flexibility in terms of four different perceived leadership styles that would be used in four different problem situations, while the present study will be limited to a single situation, both studies are quite different from each other.

d. Leaders whose initiating structure behaviors are heterogeneous across followers will have a greater number of highly productive followers in comparison to leaders whose structuring behaviors are homogeneous across followers. Heterogeneous behaving leaders are defined as those who tend to spend more time clarifying roles, tasks, and expectations with some followers than with other followers, while homogeneously behaving leaders are defined as those who spend an equal amount of time clarifying roles, tasks, and expectations with each follower. This hypothesis was based upon the assumption that a leader who devotes his limited time to instruct those followers who have a real need for assistance will have a greater number of technically competent followers. Also, the unequal distribution of assistance will not be interpreted by the followers as leader favoritism because the leader's behavior is directly related to task accomplishment.

Measurement Considerations

As one reviews the leadership literature, one becomes acutely aware of the fact that in much of the research many measurement considerations have been either overlooked or relegated to a position of secondary concern. There are several exceptions such as the Ohio State studies which resulted in the development of the LBDQ. However, in most cases, the researchers rushed to test theorized relationships and neglected the measures on which their findings were based. Korman (1973) and Fleishman (Fleishman & Hunt, 1973) have alerted researchers about the need to devote more care and thought to the measures that are used. As an example of the problem, leader behavior styles such as Consideration and Initiation of Structure are often measured with different instruments, e.g., the Leadership Opinion Questionnaire (LOQ) and the LBDQ. Yet, the resultant scores are discussed as though they are interchangeable. A detailed comparison of these instruments reveals

that the LOQ consideration and structure scores are derived directly from the leader. In fact, the instructions of the LOQ state:

> For each item choose the alternative which most nearly expresses your opinion of how frequently you should do what is described by that time. Always indicate what you, as a supervisor, or manager, sincerely believe to be the desirable way to act. (Fleishman, 1969)

On the other hand, the LBDQ yields consideration and initiation of structure scores that are based upon descriptions of a supervisor's (leader's) behavior and are obtained from the supervisor's subordinates. Thus, although similar labels are used to describe the leader behaviors that are measured by the LOQ and the LBDQ, the scores are based on different items and are derived from different sources. The consequences, if any, of these differences deserve to be investigated as they could account for a portion of the inconsistencies in previous research results.

These general observations led to the eventual formulation of the third research objective which, in turn, owed its existence to three primary sources. The first source was Fleishman's (Fleishman & Hunt, 1973) comment that the distinctions between attitudes, perceptions, and behaviors are not always kept clear in leadership research. He also noted that leader behavior observations were notably absent from much of the previous work in leadership.

The second source was a comment by Scott and Cummings (1973). While discussing the different aspects of leadership research they noted:

> ...the assumption that a given class of leader behaviors causes subordinate behavior is a troublesome one especially when the causal assumption is based upon an analysis of relationships between leaders' behaviors as perceived by subordinates and some index of subordinate behavior. (p. 431)

The third source was a note by Guion (1973) on the potential for ambiguity when dealing with the idea of a "perceived organizational climate." Briefly, he stated that when a measure of the perceived organizational climate is obtained from the employees themselves, it may simply be a different name for job satisfaction or employee attitudes, as perception can be used to infer attitude. Applying this note of caution to the domain of leadership research, one can readily see the question it raises. Namely, "Are measures of leader behavioral styles, when these measures are obtained from the followers, merely other names for follower attitudes or do these measures accurately represent the hypothesized constructs?" Providing an answer to this question constitutes the third objective of the present study.

Based upon this objective and the previous observations, the following hypothesis was made:

3. Hypothesis relevant to the issue of source of leader behavior measures:

   a. Measures of leader behavioral styles that are obtained from followers will differ from identical measures that are obtained from external observers.

METHODOLOGY

Subjects

The subjects were 80 male college students who participated as paid volunteers. Their ages ranged from 18 years to 25 years, with a median age of 19.43 years. The majority of the subjects were contacted during the fall of 1974 while they were enrolled in an introductory psychology course. The remainder of the subjects were recruited during January 1975 when they responded to an ad in the local university newspaper.

All subjects were contacted by telephone and asked to participate on a voluntary basis. They were advised that course credits would not be given in exchange for their assistance. However, they were informed that they would be paid on the basis of a piece rate system that guaranteed an average wage of $2.00 per hour, and that the study would require one evening of their time.

Experimental Setting

The experiment was conducted within the context of a branch in a bogus greeting card company. This "company" had three full-time staff members--a Branch Manager, Quality Control Inspector, and a Supply Clerk. Those positions were filled by paid assistants who played the roles for all sessions of the data collection phase. The subjects were assigned the roles of supervisors and workers. Each production team was comprised of a supervisor and three workers who, in turn, were assigned the task of producing "origami" paper cranes and were paid on a piece-rate basis. All participants were provided with complete role and task instructions, pertinent forms, construction paper, and equipment, and had to comply with standardized "company" procedures. The role playing demanded behaviors very similar to that required by actual workers in a production setting. Figure 1 depicts the organizational chart of the simulated branch. Each work group was observed by two external observers who recorded the leader's behaviors as he interacted with his followers.

Experimental Task

The experimental task involved the construction of "origami" cranes from sheets of paper (see Appendix A). A pilot study revealed the task had moderate intrinsic interest, was moderately difficult, had high decision verifiability, and had a low degree of population familiarity. The task was conducted within the context of the previously described experimental setting.

Independent Variables

The primary independent variables were (a) leader-follower compatibility that was operationalized on the basis of various combinations of leader dominance and follower dominance, (b) degree of interfollower cooperation, and (c) degree of follower task experience. These variables

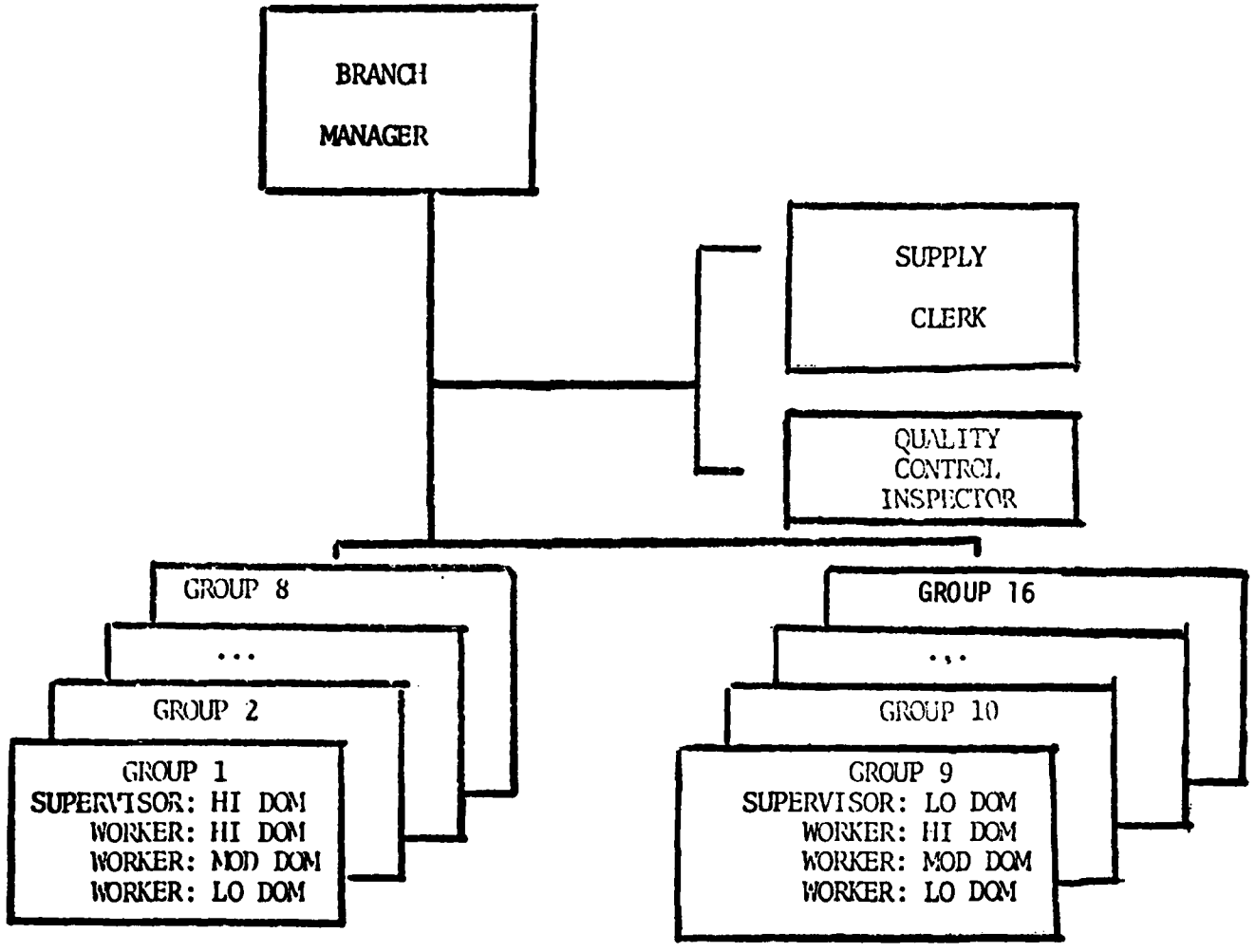

Figure 1. Organizational chart of branch in bogus company.

were selected to represent the leader, the follower, and the situational forces described in the Tannenbaum and Schmidt (1958) model.

Dominance-Based Compatibility

Both leader dominance and follower dominance were operationalized in terms of dominance scores as measured by the California Psychological Inventory (CPI) (Gough, 1957; Megargee, 1972). The scores served as the basis for forming leader-follower dyads that, in turn, were assumed to result in different degrees of personality compatibility between a specific leader and a specific follower. The raw dominance scores were converted into standardized T scores (mean of 50 and standard deviation of 10), and then trichotomized into three categories of dominance--low, moderate, and high. T scores of 60 and greater were classified as high dominance; scores of 40 and below were classified as low dominance; and scores that fell within the range "less than 60 but greater than 40" were classified as moderate dominance. Based upon the findings in a study that investigated dominance as a factor in achievement in cooperative problem solving (Smelser, 1961), it was hypothesized that the various leader-follower dyadic combinations would result in varying degrees of leader-follower compatibility. Table 2 contains the leader-follower dominance combinations that were tested, and the hypothesized degrees of compatibility. Due to the exploratory nature of the study, leader dominance was limited to the low and high categories. However, follower dominance was represented by low, moderate, and high levels. The basis for this decision was Weick and Penner's (1966) argument that triads heighten the potential for differentiation among group members (a key facet of the VDL versus ALS comparison), provide sources of rewards not possible with dyads, and create a potential for majority rule which may become a mode of influence. In addition, a group comprised of a leader and three followers was deemed to be more representative of actual work groups than a group comprised of a leader and two followers.

Cooperation Conditions

The degree of interfollower cooperation was varied by manipulating the role playing instructions. In the low cooperation condition, "company policy" required each follower to produce a complete crane on his own. That is, each follower had to go through the entire series of 29 steps to produce a crane (see Appendix A).

In the high cooperation condition, "company policy" required the followers to complete each crane as a team effort. That is, each follower was assigned either the first nine, the second 10, or the last 10 sequential steps that were required to construct a crane (see Appendix B).

Due to the lack of previous research on the origami construction task and to the inability to locate previous studies that investigated the combined effects of leader-follower compatibility and varying degrees of interfollower cooperation, there was no theoretical or rational basis for hypothesizing what specific behaviors would be expected under the low and high cooperation condition.

Table 2

Hypothesized Compatibility Outcomes

DOMINANCE		DYAD COMPATIBILITY
LEADER	MEMBER	
HIGH	HIGH	MODERATE (3)
	MOD	MODERATE--HIGH (4)
	LOW	HIGH (5)
LOW	HIGH	LOW (1)
	MOD	LOW--MODERATE (2)
	LOW	MODERATE (3)

Task Experience

The degree of task experience was operationalized by having the followers go through two separate 1-hour production sessions. During the first session, the followers were unfamiliar with the construction task and had to rely upon the leader to learn how to fold the cranes. However, by the second session, all of the followers were able to perform the task by themselves.

Additional Variables

Additional independent variables, which were not an integral part of the basic experimental design, included a baseline measure on follower task-ability, leader-follower compatibility operationalized in terms of interpersonal attraction, and attitude similarity between leader and follower. These variables were not manipulated, but they were measured to provide data for manipulation checks and for dealing with alternative hypotheses.

The baseline measure on worker ability was obtained from a job sample test that involved the construction of paper balloons (see Appendix C) while the subject worked under a piece-rate system.

Leader-follower compatibility was based upon the degree of interpersonal attraction between the leader and each of his followers. Byrne's (1971) Interpersonal Judgment Scale (IJS) was used to obtain measures on the degree of attraction expressed by the leader toward each of his followers, as well as the degree of attraction expressed by each follower, within a work group, toward the leader. The leader-to-follower and the follower-to-leader scores were split at their respective medians, and leader-follower compatibility was operationalized in terms of the combinations listed in Table 3. If the leader-follower compatibility groupings that were based upon leader and follower dominance scores were successful, it was predicted that compatibility, as defined by the IJS combinations, should correlate highly with dominance-based compatibility.

Attitude similarity was measured with a short form of Byrne's (1971) Survey of Attitudes (SOA) Scale (see Appendix D). For each item in the scale, a leader and a follower were categorized as being similar in attitude when each individual's choice was confined within the first three of the six possible choices. On the other hand, two individuals were categorized as being dissimilar in attitude on an item when one person's choice was located within the first three choices while the other person's choice was located within the last three choices and vice versa. It was assumed that attitude similarity would have an influence upon leader-follower compatibility.

Procedures

Paid Assistants

Prior to the experiment, three male college students were hired to play the roles of branch manager, supply clerk, and quality control inspector. They were briefed on their respective roles and provided with role instructions

Table 3

Compatibility Levels[a]

Leader-to-Follower Attraction (Median = 11.21)	Follower-to-Leader Attraction (Median = 10.75)	Compatibility Level	Assigned Scale Value
Above Median	Above Median	High	3
Below Median Above Median	Above Median Below Median	Moderate	2
Below Median	Below Median	Low	1

[a] In terms of interpersonal attraction as measured with Byrne's (1971) Interpersonal Judgment Scale.

(see Appendix E). They spent an evening practicing their roles with actual subjects working under actual production conditions. All three paid assistants kept their assigned roles throughout the entire study.

The manager was responsible for the management of the entire branch. He resolved problems and questions that arose over operating policies and procedures and gave his leaders feedback on their job performance. He was placed on a salary that averaged out to $3.00 per hour.

The quality control inspector was the only person who inspected the completed cranes during the entire study. He used a list of specific quality control standards (see Appendix E) and made all decisions to either accept or reject completed cranes. Whenever he rejected a crane, he was required to inform the affected leader of the reason for rejection. The quality control inspector was paid $2.50 per hour.

The supply clerk issued sheets of construction paper and construction tools, e.g., rulers, letter openers, protractors, etc., to each leader. The clerk also maintained a record of when the sheets of paper were requisitioned as well as the amount that was returned at the end of each production session. He was paid $2.50 per hour.

The three paid assistants were not informed of the hypotheses being tested. The use of these assistants was intended to reduce the possibility of experimenter effects (Rosenthal & Rosnow, 1969).

Paid Observers

Prior to the study, four male college students were hired and trained to observe and record leader behaviors that were similar to consideration and initiation of structure. During the study, a pair of observers was assigned to each of the two production rooms that were used during the study. There they observed a work group comprised of a leader and three followers who were involved in the origami construction task. Two groups were run during each evening. By using a Leader Behavior Coding Sheet (LBCS) the observers were able to record the number of times a leader exhibited specific initiating structure and/or consideration behaviors toward each of his followers, toward any two of the three followers, or toward all three followers at once. All observers were trained during a practice session which included the use of actual subjects working under actual production conditions. Particular emphasis was placed upon the four observers being able to agree upon the specific items that they used to categorize various leader behaviors. During the study, the observers were paired according to a rotation schedule (see Appendix F) which was designed to counterbalance the number of times a particular observer was teamed with a different observer, as well as the type of cooperation condition under which each pair of observers observed a work group. Each pair of observers was located in the rear of a 45-seat classroom. The followers had their backs toward the observers and they (the followers) were seated in the front row separated by an empty seat between each of them. This seating arrangement facilitated the observers' task of coding the leader-follower interactions. The leader sat at a table that was situated at the front of the room and he faced the observers.

Pretesting

During September 1974, a shortened form of the CPI was administered to 170 male undergraduate students who were enrolled in an introductory psychology course and who participated to fulfill part of the course requirements. During each testing session, the CPI was one of several pretest instruments completed by the students. In January 1975, when a potential shortage of low dominance subjects appeared imminent, the CPI was administered to 60 additional male undergraduates who responded to an ad placed in the local campus paper and asking for paid volunteers to participate in an experiment. The raw CPI scores (dominance) were converted into standardized T scores (mean of 50 and standard deviation of 10) and trichotomized into categories of low dominance (scores of 40 and below), moderate dominance (scores of less than 60, but greater than 40), and high dominance (scores of 60 and greater). Fifty-one volunteers (23%) fell into the low category, 113 (51%) fell into the moderate category, and 58 (26%) fell into the high category.

Schedule of Events

As soon as all of the volunteers who were scheduled for a particular evening were present, or as soon as the appropriate number of subjects was attained by using volunteers from a substitute pool, the experiment was started. All subjects were given a general description of the purpose of the study, the basic procedures, the time requirement, and the pay system. Then, they were informed of their right to terminate their participation during any stage of the experiment, told that the data would be kept confidential, asked to sign an informed consent form (see Appendix G), and completed administrative forms that were required for pay purposes. Throughout the entire study, only one volunteer asked to be excused. This individual had a congenital birth defect and was scheduled to play the role of a leader. His request was fulfilled and he was replaced with a substitute. In summary, the treatment of the paid volunteers was in accordance with the ethical standards of the APA (1973).

Practice Session for Leaders. Prior to the start of the first production session, all subjects selected to play the role of leaders were given an hour of instruction on the construction task by one of the experimenters. This session was considered to be vital to the study as a pilot had revealed that unless the leaders were technically competent, the followers would not always turn to their leaders for guidance and support. Instead, a follower would occasionally turn to another follower for assistance, thus weakening the role of the leader. The training was conducted in a room that was separated from that in which the followers were assembled. The training of the leaders provided them with technical knowledge and experience which reinforced their roles--at least, initially.

Job Sample Test. Prior to the start of the first production session, all subjects designated as followers were given a job sample test (see Appendix C), namely, the task of constructing balloons out of sheets of paper. One of the experimenters showed the followers how to construct the balloon. Then they were given 20 minutes to construct as many balloons as possible and paid a bonus for each balloon. During the 30-minute test session each

follower was paid $1.00 plus whatever amount he earned in bonus money. This pay system was instituted to approximate the motivational setting in the actual experiment.

Production Session 1. Upon completion of the practice session for leaders and the job sample test for followers, the followers were told to join their leaders in rooms that had been assigned to each group for the production session. At the start of the first 60-minute production session, each leader introduced himself to his followers, informed them that the most productive work group during the study would be given a $25.00 bonus to be divided according to the wishes of the group members, gave each follower a set of role and task instructions (see Appendixes A and B), and, after giving them approximately 5 minutes to review the instructions, showed them how to construct the crane. On the average, each leader devoted approximately 20 minutes of the first production session to the training of his followers. During the session, each follower was awarded work credits according to the number of completed cranes that passed the quality control inspection, and was paid in accordance with the different rates that corresponded to the different ways in which work credits could be earned.

Posttest 1. At the end of the first production session, each leader completed an Interpersonal Judgment Scale (IJS) (Byrne, 1971), a Worker Rating Report (see Appendix H), and an Employee Pay Record (see Appendix I) on each of his followers. In addition, each leader completed the short form of the Minnesota Satisfaction Questionnaire (MSQ) (Weiss, Dawis, England, & Lofquist, 1967) to describe his intrinsic, extrinsic, and general job satisfaction.

Each follower completed an IJS, a Behavior Checklist (BC) (see Appendix J), and a LBDQ on his leader, and the MSQ on himself.

Leaders and followers were placed in separate rooms during the posttest since it was felt that the presence of each in the same room would inhibit honest responses.

The observers turned in their Leader Behavior Coding Sheets (LBCS) (see Appendix K) and then completed a BC and LBDQ on their respective leaders.

The entire posttest took from 20 to 25 minutes and was followed by a 10-minute rest break. During the posttest, the subjects were paid at the rate of $2.00 per hour.

Sometime between the rest break and Production Session 2, each leader met with his followers and had them review their pay records (see Appendix I). If a leader and a follower agreed upon the correctness of the record, they both signed the form. If they disagreed, they presented their respective arguments to the branch manager who made the final decision on all points of disagreement. As soon as the pay records were signed, the members of each group decided upon how they would divide the $25.00 bonus--assuming their group's total work credits proved to be the highest during the entire study.

Production Session 2. This session was similar to the first production session in that it was 60 minutes in length, was conducted during the same

evening as session 1, and the followers worked under the same cooperation condition. However, it differed from Production Session 1 as the followers were supervised by a different leader.

Posttest 2. At the end of Production Session 2, the leaders and followers were administered the same set of instruments they had completed during Posttest 1. They were also administered a shortened form of Byrne's (1971) SOA (see Appendix D), and other scales that were not related to the planned analyses. As soon as the Quality Control Inspector completed his records, the Branch Manager filled out the employee pay records and turned them over to the appropriate leader who, in turn, met with his followers to review the records for correctness and to decide upon the manner in which the potential $25.00 bonus would be distributed. After the group meeting, the leader and followers returned to their separate rooms where they completed the posttest instruments.

Debriefing. After each volunteer completed the battery of posttest instruments, he was given a postexperimental questionnaire (see Appendix L) which was designed to check on the effectiveness of the role instructions and various manipulations. Upon turning in the entire posttest package and the questionnaire, each volunteer was debriefed by one of the experimenters and given a debriefing sheet (see Appendix M).

Dependent Variables

The dependent variables were leader behaviors, group and individual performance, and individual job satisfaction. The leader's behaviors were treated both as independent and as dependent variables in the analyses.

Leader Behaviors. The leader behaviors were measured with three different instruments. The first was a short form of the LBDQ (Stogdill, 1963) and it included the Consideration, Tolerance of Freedom, Initiation of Structure, Production Emphasis, and Role Assumption subscales. The LBDQ was completed by the observers and the followers.

Because the LBDQ did not lend itself to the real-time recording of observed leader-follower interactions, a second instrument was constructed. Its basic component was a checklist comprised of leader behaviors that had been identified in previous research on leaderless group discussions (Bass, 1954). The entire instrument (see Appendix K) contains 14 items and was labeled the "Leader Behavior Coding Sheet" (LBCS). It was completed by the external observers who recorded the leader-follower interactions in terms of leader behaviors as the behaviors occurred in each production session. Half of the items are related to what the Ohio State Studies (e.g., Stogdill & Coons, 1957) label "Initiation of Structure" while the remaining half are related to the "Consideration" dimension. The checklist was designed so the observer could record the exact number of times a leader used any of the 14 behaviors as he interacted with any or all of his three followers. The sheet was configured so the observer could make an entry whenever the leader spoke to follower 1, 2, or 3; or to followers 1 and 2, 2 and 3, etc. The observed leader behaviors were recorded the moment they occurred.

To obtain leader behavior measures that are similar to those obtained from the observers using the LBCS, a third instrument was constructed. It was called the "Behavior Checklist" (BC) (see Appendix J) and it contained the identical 14 items that were used for the LBCS. The BC was completed by each of the followers and observers at the conclusion of each production session. Thus, beside providing a basis for determining the effect of having identical items completed at different times and in a different manner, the BC yielded identical measures from different sources--followers and observers.

Performance Measures. These measures were collected in terms of work credit productivity and follower performance ratings.

With respect to productivity, in the low cooperation condition where each follower worked by himself, three work credits were awarded to each follower for each crane he completed that successfully met the quality control standards.

In the high cooperation condition, since each work group was comprised of three workers who were sequentially dependent upon each other, to a degree, the second and third followers were each provided with an individual supply of partially completed cranes. Thus, if the first follower was slower than the second, the second follower was able to turn to his reserve pile of partially completed cranes and continue to work upon his phase of the total task without being affected by slowness on the part of the first follower. Likewise, the third follower was able to turn to his reserve pile of partially completed cranes and continue to work upon his phase of the total task without being impeded by slowness on the part of the second follower. By having the first follower use white paper, and having the second and third followers' partially completed cranes made out of blue and pink paper, respectively, it was possible to obtain equivalent productivity measures under both the high cooperation and low cooperation conditions. The "work credit" was devised to function as the common measure of productivity. It represented credit that was awarded to a follower whenever a crane that he had completed by himself or in cooperation with his co-followers passed the quality control inspection. The piece rate system that was established for the high cooperation condition paid more for a crane that was completed as a result of three followers working as a team than a crane completed by a worker working independently. This pay system was designed to promote a high level of cooperation among the three followers in each work group.

Follower performance ratings were obtained by using a rating form that included items on quality of work, quantity of work, attitude, and promotion potential (see Appendix H). Each of the four items was scored from one to five with five representing the most positive stem. The followers' performance rating score was the sum of the item scores.

Job Satisfaction. This dependent variable was measured with the short form of the Minnesota Satisfaction Questionnaire (MSQ) (Weiss, Dawis, England, & Lofquist, 1967). This instrument was selected because it yields measures on intrinsic, extrinsic, and general satisfaction.

Experimental Design

The basic design was a 2 x 2 x 2 x 3 factorial design. Factor A was represented by two levels of cooperation (low cooperation = individual effort, and high cooperation = team effort); Factor B was represented by two different production sessions (Session 1 = low task experience, and Session 2 = high task experience); Factor C was represented by two types of leaders (low = low dominance leader, and high = high dominance leader); and Factor D was represented by three types of followers (low = low dominance follower, moderate = moderate dominance follower, and high = high dominance follower). This design was chosen over an alternative design which changed cooperation conditions while keeping the leaders and followers constant over the production sessions, because the latter design contained a high potential for demand characteristics. In addition, the present design approximates the real work situation found in formal organizations such as the military where leaders are changed more frequently than the manner in which tasks are accomplished.

Due to difficulty encountered in obtaining volunteers from the low dominance category, during the recruiting phase, each group of followers was put through two production sessions. As a result, each group of followers and the particular level of cooperation condition under which the group worked remained constant over time, while both the level of experience and type of leader changed over sessions. The order in which a group of followers was teamed with a high or low dominance leader was counterbalanced. The original design called for 16 groups to be run over 8 evenings, i.e., 2 groups per evening; however, because scheduled volunteers failed to show and because a lack of low dominance substitutes made it impossible to assign a low, moderate, and high dominance follower to each and every group, 4 additional groups were added to the data collection schedule (see Appendix N). With two leaders and 6 followers required for each evening, a total of 80 volunteers participated in the study. The 3 paid assistants who played the roles of Branch Manager, Quality Control Inspector, and Supply Clerk were not a part of the design as they remained constant across all work groups.

RESULTS

Data Used in Analyses

The analyses conducted in this study were based upon data that were obtained from the 15 work groups in which the low-moderate-high combination of dominance among the followers was attained. The data that were derived from the groups in which at least 2 of the 3 followers were in the same dominance category were not included in the analyses.

Manipulation Checks

Leader-Follower Compatibility

Interpersonal compatibility, as used within this study, is best defined in terms of Schutz's (1958, p. 108) reciprocal compatibility, the degree to which two persons "reciprocally satisfy each other's behavior preferences."

Two types of analyses were conducted to check on the dominance operationalization of compatibility. The first analysis involved the intercorrelation of the theorized compatibility as defined by the dominance matches between leaders and members, the degree of leader-to-follower attraction, the degree of follower-to-leader attraction, and the proportion of similar attitudes between a leader and a follower. Based upon the assumption that members of a dyad who are attracted to each other and/or have similar attitudes are more compatible than leaders and followers who are not attracted to each other and/or have dissimilar attitudes, it was hypothesized that the compatibility variable would be highly correlated with the attraction or the similarity of attitude measures. Table 4 shows the correlation of dominance with various attraction measures. The results are shown in Table 4. Only one of the six correlations was significant. The dominance operationalization of compatibility clearly was not effective.

The second type of analysis involved a series of one-way analyses. The postulated levels of compatibility were used to divide the sample into different treatment groups, and the leader-to-follower attraction scores, the follower-to-leader attraction scores, and the proportion of similar attitudes between a leader and a follower were used as dependent variable measures in the separate analyses. It was hypothesized that if the dominance manipulation of compatibility was effective, it should have a significant effect upon these related measures. Furthermore, the ANOV could detect nonlinear effects which could not be detected by the correlations. Only one (leader-to-follower attraction) of these analyses showed any relationship between compatibility defined by the dominance combinations and the other measures of compatibility. However, although the leader-to-follower attraction was significantly related to compatibility as defined by dominance ($F(4,85) = 4.17$, $p \leq .01$), the pattern of means was uninterpretable and the differences between means were too small to possess any practical significance. (Appendixes O, P, and Q present the cell means and ANOVA summary tables for these analyses.) Based upon the results of both sets of analyses, it was concluded that the dominance manipulation of compatibility was not effective.

In light of the lack of support for the dominance manipulation to establish different levels of compatibility, it was decided to use a post hoc classification of compatibility. This second operationalization of compatibility was based upon various post hoc combinations of leader-to-follower and follower-to-leader attraction scores. As shown in Table 3 when both leader and follower were attracted to each other, it was postulated that the dyad would be highly compatible and it was assigned an arbitrary value of 3. When one member of a dyad was attracted to the other, but the attraction was not reciprocated by the other member, both members were assumed to be moderately compatible. Because there was no known reason for postulating a greater degree of compatibility when the direction of attraction was from the follower to the leader, or vice versa, both combinations were assigned a value of 2. The least compatible combination was assumed to be the case when neither the follower nor the leader was attracted to the other. This combination was given a value of 1. Median splits were used to operationalize attraction, i.e., all IJS scores that were above their respective medians were designated as cases of attraction while scores below their respective medians were designated as cases of nonattraction.

Table 4

Intercorrelation Matrix of Compatibility (Dominance) and Related Variables

	2	3	4
1. Compatibility	-.14	.16	-.04
2. Leader-to-Follower Attraction		-.13	.23*
3. Follower-to-Leader Attraction			.12
4. Similarity of Attitudes			

* $p < .05$.

Note. n = 90. All tests are two tailed.

It was hypothesized that the present operationalization of compatibility would correlate with measures such as similarity of attitudes and with measures of leader behavior obtained from the members. Specifically, we would expect compatibility to be more highly correlated with similarity of attitudes, consideration, and tolerance of freedom than with initiation of structure, production emphasis, and role assumption. The Pearson Product Moment Correlation Coefficients for the intercorrelations of these measures are listed in Table 5. As predicted, the correlations between compatibility and the conceptually related measures (similarity of attitudes, consideration, and tolerance of freedom) are significantly correlated, $p < .001$. However, only initiation of structure and role assumption of the conceptually unrelated measures were significantly correlated with compatibility, $p < .05$. Also, as expected, the values of the correlation coefficients were higher for the group of measures that were related to compatibility than those for the group of unrelated measures. Thus, on the basis of the intercorrelation analysis, the post hoc operationalization of compatibility in terms of interpersonal attraction appeared to be effective.

A second set of analyses, similar to the series of one-way analysis of variance (ANOV) tests that were used to test the dominance operationalization of compatibility, was also conducted. The levels of compatibility that are shown in Table 3 were used to divide the sample into three treatment groups. It was hypothesized that, if the interpersonal attraction definition of compatibility was effective, it should have a significant relationship with such measures as similarity of attitudes, consideration, tolerance of freedom, initiation of structure, production emphasis, and role assumption. Following a line of reasoning that is similar to that used in the intercorrelational approach, it was assumed that there would be a greater number of significant F ratios among the measures that are conceptually related to compatibility than among the unrelated measures. As predicted, the series of one-way ANOV tests indicated that compatibility was significantly associated with similarity of attitudes ($F(2,87) = 7.10$, $p < .01$), consideration ($F(2,87) = 8.78$, $p < .01$), and tolerance of freedom ($F(2,87) = 10.27$, $p < .001$). As Table 6 shows, in all cases the means were in the predicted direction. Complete ANOV summary tables are located in Appendixes R, S, and T.

Of the measures that are not conceptually similar to compatibility, only initiation of structure ($F(2,87) = 3.56$, $p < .05$) and role assumption ($F(2,87) = 3.67$, $p < .05$) were influenced by compatibility (see Appendixes U and V). Compatibility had no effect upon production emphasis (see Appendixes U, V, and W for ANOVA summary tables).

Based upon the results of both sets of analyses, it was concluded that the interpersonal attraction operationalization of compatibility was reasonable and could be used as a basis for further analyses.

Reliability of Observer Measures

Leader Behavior Coding Sheet (LBCS)

The LBCS permitted the external observers (working in pairs) to observe the manner in which the leader interacted with any one of his followers, with

Table 5

Intercorrelation Matrix of Compatibility and Manipulation Check Variables

	2	3	4	5	6	7
1. Compatibility	.36***	.41***	.38***	.25*	.07	.28*
2. Similarity of Attitudes		.17	.19	.14	.17	.07
3. Consideration			.41***	.41***	.41***	.57***
4. Tolerance of Freedom				.29**	.20	.32**
5. Initiation of Structure					.57***	.53***
6. Production Emphasis						.39***
7. Role Assumption						

Note. n = 90. All tests are two-tailed.

* $p < .05$.
** $p < .01$.
*** $p < .001$

Table 6

Similarity of Attitude and Leader Behavior Means for the Three Levels of Compatibility as Defined by Interpersonal Attraction

	Interpersonal Attraction					
	Low (N=23)		Medium (N=46)		High (N=21)	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1. Similarity of Attitudes	57.0	13.12	61.09	10.85	69.29	8.84
2. Consideration	29.30	4.58	33.07	6.23	36.10	4.06
3. Tolerance for Freedom	33.35	5.08	38.76	4.90	39.48	5.86
4. Initiation of Structure	31.70	4.57	32.65	6.89	36.19	5.05
5. Role Assumption	33.57	5.39	35.91	6.42	38.33	4.82
6. Production Emphasis	32.17	6.96	31.85	8.42	33.76	7.40

any two of his followers, or with all three of his followers at once. The average interrater reliabilities, when the observers recorded the dyadic interactions between the leader and a specific follower, were $\bar{r}$ = .86 for the consideration (C) dimension and $\bar{r}$ = .91 for the initiation of structure (IS) dimension. Due to the extremely small number of cases that involved the leader interacting with two and only two of his followers at once, the interrater reliabilities of this mode of interaction were not computed and omitted from all analyses. The interrater reliabilities for the situation in which the leader interacted with all three followers at the same time were $\bar{r}$ = .90 for C and $\bar{r}$ = .87 for IS. When the scores that involved dyadic interactions between the leader and a specific follower and those that involved the leader interacting with all three followers at once were summed, the average interrater reliabilities were $\bar{r}$ = .92 for C and $\bar{r}$ = .97 for IS. Appendix X contains the specific interrater reliabilities for different observer pairs and different follower combinations.

Observers' LBDQ Scores

The average interobserver reliabilities for the LBDQ subscale were as follows: C, r = .67; TF, r = .57; IS, r = .72; PE, r = .73; and RA, r = .73. Appendix Y contains the specific interrater reliabilities for these subscales.

Observers' BC Scores

The average interobserver reliabilities for the BC were $\bar{r}$ = .83 for C and $\bar{r}$ = .72 for IS. Appendix Z lists the specific reliabilities.

Tests of the Hypotheses

Because the manipulation check resulted in the conclusion that the operationalization of leader-follower compatibility (based upon different combinations of leader and follower dominance) was not effective, the data were not analyzed in terms of the basic experimental design. Instead, the major hypotheses were tested in accordance with a 2 x 2 x 3 post hoc design (Figure 2) which used cooperation condition, task experience (session), and compatibility (based on interpersonal attraction) as the respective factors. This design change necessitates the interjection of one caveat: to define compatibility by the interpersonal attraction scores violates the random assignment of subjects to conditions assumption of the analysis of variance model. Such a violation means that compatibility cannot be considered an independent variable in the pure sense. Rather, any effects with compatibility must be considered much the same as correlational design; the possibility of a third variable causing the effect is no longer controlled by randomization. Nevertheless, given that the compatibility manipulation was not successful, the definition used should be useful in the correlational sense. Interpretations will take this into account.

A COOPERATION CONDITION	LOW COOPERATION						HIGH COOPERATION					
B TASK EXPERIENCE	LOW (SESSION 1)			HIGH (SESSION 2)			LOW (SESSION 1)			HIGH (SESSION 2)		
C COMPATIBILITY	L	M	H	L	M	H	L	M	H	L	M	H

Figure 2. Post hoc experimental design. L = low, M = moderate, and H = high compatibility.

Hypothesis 1a

This hypothesis was concerned with the relationship between leader-follower compatibility and the follower's performance. It states:

> The greater the degree of leader-follower compatibility, the greater the follower's performance.

In testing this hypothesis, performance was operationalized in two different, but common, ways--productivity (work credits) and worker performance ratings. The positive relationships between the various levels of leader-follower compatibility and performance measures that are predicted by the hypothesis were tested with a series of planned comparisons (Hays, 1963, pp. 462-466).

With work credits as the specific productivity measure, there were no significant differences between the means of (a) low compatibility ($\bar{X}$ = 24.15) and moderate compatibility ($\bar{X}$ = 26.67) groups, and (b) moderate compatibility ($\bar{X}$ = 26.67) and high compatibility ($\bar{X}$ = 25.65) groups.

Using worker performance ratings as the performance measure, a similar series of planned comparisons revealed no significant difference between the mean of the moderate compatibility group and that of the low compatibility group. However, there was a significant difference between the moderate ($\bar{X}$ = 13.36) and the high ($\bar{X}$ = 16.04) compatibility groups ($t(78) = 3.20$, $p < .01$). Table 7 lists the performance means for each cell of the design as well as other means to be referred to in Hypothesis 1b.

Based upon these results, Hypothesis 1a is not supported when work credits are used to represent performance. However, the hypothesis is partially supported when worker performance ratings are used to represent performance. In particular, the performance ratings of the followers in the high compatibility group were significantly greater than the ratings of the followers in the moderate compatibility group. The analysis of variance on worker performance ratings indicated no interaction between cooperation condition, task experience, and compatibility.

Hypothesis 1b

This hypothesis predicts that leader-follower compatibility will influence follower satisfaction. Specifically, it states:

> The greater the degree of leader-follower compatibility, the greater the follower's job satisfaction.

Job satisfaction was measured with the MSQ; therefore, this hypothesis was tested with respect to intrinsic, extrinsic, and general satisfaction as the dependent variable measures. The analyses called for a series of planned comparisons of the pertinent means (Hays, 1963, pp. 462-466), provided there were no interactions which could moderate the main effects of compatibility. When interactions were present, post hoc comparisons, using Scheffe's (1959) procedure, were conducted to determine how cooperation condition and task experience moderated the influence of compatibility on job satisfaction.

Table 7

Cell means of work credits, worker performance ratings, and intrinsic, extrinsic, and general satisfaction (MSQ)

TASK EXP.	COMPAT.	WORK CREDITS (COOP. COND.) LOW	WORK CREDITS (COOP. COND.) HIGH	WORKER PERFORM. RATINGS (COOP. COND.) LOW	WORKER PERFORM. RATINGS (COOP. COND.) HIGH	INTRINSIC SATISFACTION (COOP. COND.) LOW	INTRINSIC SATISFACTION (COOP. COND.) HIGH	EXTRINSIC SATISFACTION (COOP. COND.) LOW	EXTRINSIC SATISFACTION (COOP. COND.) HIGH	GENERAL SATISFACTION (COOP. COND.) LOW	GENERAL SATISFACTION (COOP. COND.) HIGH
	HIGH	39.43	27.00	15.14	18.00	39.43	55.00	22.14	25.00	68.14	90.00
HIGH	MOD	28.33	43.14	12.22	16.57	40.00	39.07	21.00	18.00	68.44	64.43
	LOW	28.64	31.33	10.73	13.33	39.55	26.00	18.82	14.00	65.73	45.67
	HIGH	12.86	23.33	14.00	17.00	41.43	39.50	21.14	20.00	70.86	67.83
LOW	MOD	13.50	21.71	11.94	12.72	41.25	39.00	19.25	18.29	67.56	64.71
	LOW	11.25	25.40	12.00	13.20	31.50	28.60	17.25	14.20	53.00	48.00

With intrinsic satisfaction as the dependent variable measure, there was a cooperation condition by task experience by compatibility interaction (see Table 8); therefore, several Scheffe tests were conducted to determine how the influence of compatibility was moderated by the other factors. Figure 3 illustrates the effect of compatibility under low and high task experience while both levels of experience are under a low or a high cooperation condition. Because Scheffe's procedure is extremely conservative with respect to type 1 errors, his recommendation that the .10 significance level be used (Scheffe, 1959) was adopted.

Under the low cooperation condition, when task experience was low, the difference between the means of the high and moderate compatibility groups, 41.43 and 41.25 respectively, was not significant. Therefore, these means were combined and their average was compared against the mean of the low compatibility group which had a mean of 31.50. The mean of the low compatibility group was significantly lower than the mean of the moderate and high compatibility groups combined, $F(2,87) = 4.94$, $p < .10$.

Under the same cooperation condition, but with high task experience, compatibility did not have a significant effect upon intrinsic satisfaction; the means of the low, moderate, and high compatibility groups, which were 39.55, 40.00, and 39.43 respectively, were very similar.

Under the high cooperation condition, while task experience was low, the difference between the means of the high and moderate compatibility groups was not significant. As a consequence, these two means were combined and their average was compared against the mean of the low compatibility group. The Scheffe procedure showed that the mean of the low compatibility group, 28.60, was significantly lower than the mean of the high and moderate compatibility groups combined (39.23), $F(2,87) = 6.16$, $p < .10$).

Under high cooperation, but with high task experience, the difference between the mean of the high compatibility group, 55.00, and the mean of the moderate compatibility group, 39.07, was not significant. Thus, both means were combined and then compared against that of the low compatibility group. The mean of the low compatibility group, 26.00, was significantly different from the combined mean, 40.13, $F(2,87) = 7.54$, $p < .05$.

In sum, the results indicate that degree of leader-follower compatibility does influence follower intrinsic satisfaction; however, the relationship is moderated by both cooperation condition and task experience. Because of these interactions, Hypothesis 1b receives only partial support.

With extrinsic satisfaction as the dependent variable measure, there were no interactions between cooperation condition, task experience, and compatibility. The planned comparisons indicated a significant difference between the means of the low and the moderate compatibility groups, 16.07 and 19.13 respectively, $F(2,87) = 4.00$, $p < .001$. In addition, there was a significant difference between the means of the moderate and the high compatibility groups which were 22.07 and 19.13 respectively with $F(2.87) = 3.72$, $p < .001$. These results strongly supported the predicted relations of Hypothesis 1b.

Table 8

Intrinsic Satisfaction: ANOV Summary Table

Source	Mean Square	DF	F-Ratio
Coop. Cond.	13.18	1	.20
Task Exp.	116.29	1	1.76
Compat.	711.45	2	10.74***
Coop. Cond. x Task Exp.	24.63	1	.37
Coop. Cond. x Compat.	251.29	2	3.79*
Task Exp. x Compat.	59.72	2	.90
Coop. Cond. x Task Exp. x Compat.	220.50	2	3.33*
Within	66.25	78	
Total	87.73	89	

* $p < .05$.

*** $p < .001$.

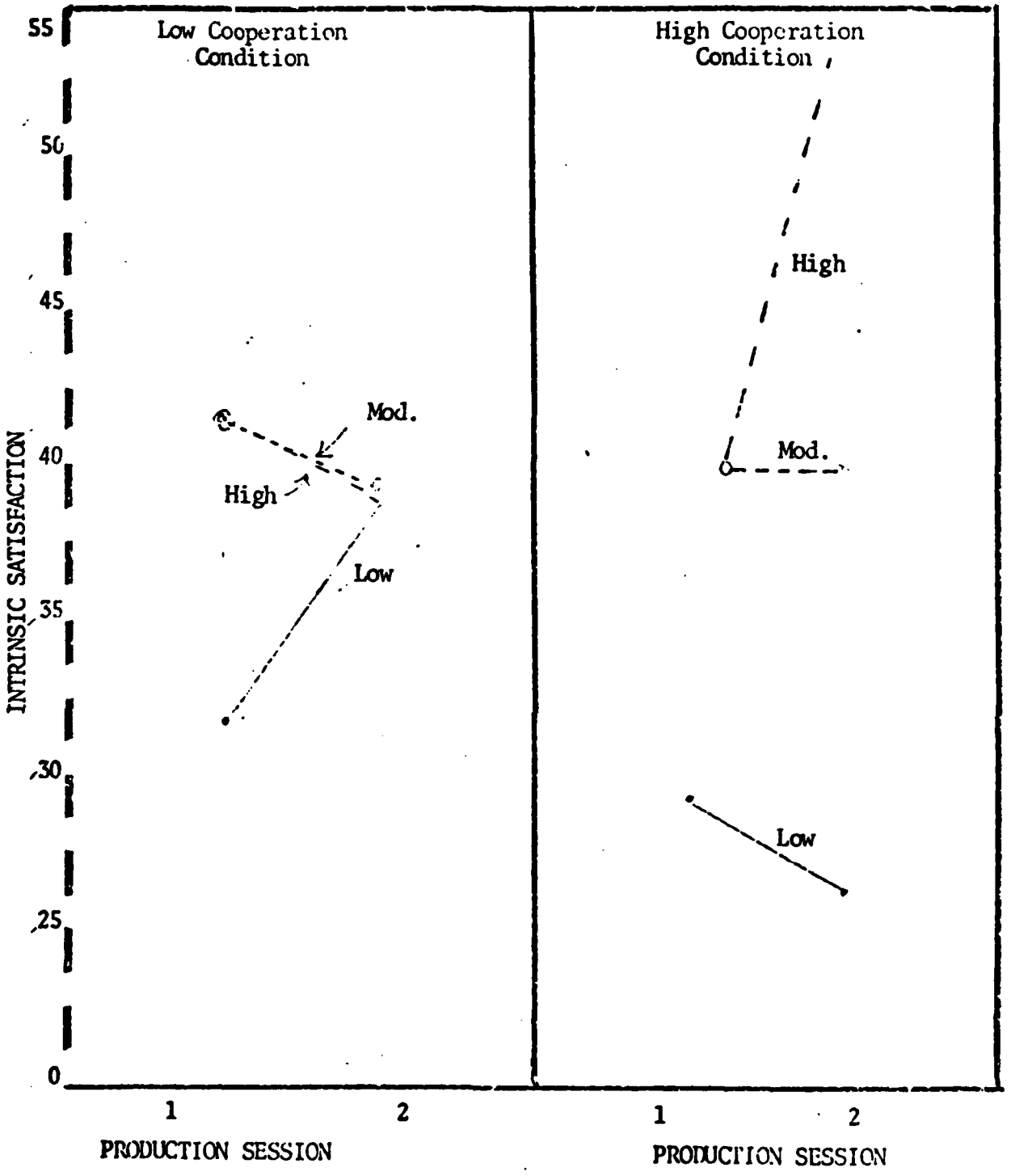

Figure 3. Effect of different levels of compatibility under different cooperation and task experience conditions with intrinsic satisfaction as the dependent variable.

With general satisfaction as the dependent variable measure, Table 9 shows there was a cooperation condition by task experience by compatibility interaction. Therefore, a series of Scheffe tests were conducted instead of the planned comparisons. Figure 4 illustrates the effect of compatibility under low and high task experience while both levels are under low and high cooperation, respectively.

Under the low cooperation condition, when task experience was low, there was no significant difference between the mean of the high compatibility group, 70.86, and the mean of the moderate compatibility group, 67.56. Therefore, the means of these two groups were combined. The difference between the combined mean, 68.57, and that of the low compatibility group, 53.00, was significant, $F(2,87) = 7.39$, $p < .05$.

Under the same cooperation condition, but with high task experience, different levels of compatibility did not have a differentiating effect upon general satisfaction as the means of the low, moderate, and high compatibility groups were 65.73, 68.44, and 68.14, respectively--all tightly clustered.

Under the high cooperation condition, while task experience was low, the difference between the means of the high and moderate compatibility groups was not significant. Therefore, these two means of 67.83 and 64.71 were combined and compared against that of the low compatibility group. The Scheffe test showed that the mean of the low compatibility group, 48.00, was significantly lower than the combined mean, 66.15, $F(2,87) = 10.66$, $p < .01$.

Under the same high cooperation condition, but while task experience was high, the difference between the mean of the high compatibility group, 90.00, and the mean of the moderate compatibility group, 64.43, was significant, $F(2,87) = 5.47$, $p < .10$. Also, the difference between the mean of the moderate compatibility group, 64.43, and the mean of the low compatibility group, 45.67, was significant, $F(2,87) = 7.79$, $p < .05$.

In sum, these results are similar to those obtained with intrinsic satisfaction and likewise provide only partial support for Hypothesis 1b because of the interaction effects due to cooperation condition and task experience upon compatibility.

Table 10 lists the proportion of variance in the dependent variables (work credits, worker performance ratings, intrinsic satisfaction, extrinsic satisfaction, and general satisfaction) accounted for by the treatment variables (cooperation condition, task experience, and compatibility) and their combinations. The Omega Squared values were computed by following the procedure contained in Kirk (1969, p. 198).

In terms of an overall summary, the relationship predicted by the hypothesis is moderated by both cooperation condition and task experience. In addition, the specific moderated relationships vary with the particular dependent variable under consideration, i.e., intrinsic, extrinsic, or general satisfaction.

Table 9

General Satisfaction: ANOV Summary Table

Source	Mean Square	DF	F-Ratio
Total	172.41	89	
Between	603.11	11	
Coop. Cond.	63.14	1	.57
Task Exp.	341.40	1	3.06
Compat.	2,010.86	2	18.01***
Coop. Cond. x Task Exp.	27.58	1	.25
Coop. Cond. x Compat.	537.51	2	4.81*
Task Exp. x Compat.	98.29	2	.89
Coop. Cond. x Task Exp. x Compat.	454.39	2	4.07*
Within	111.67	78	

* $p < .05$

*** $p < .001$

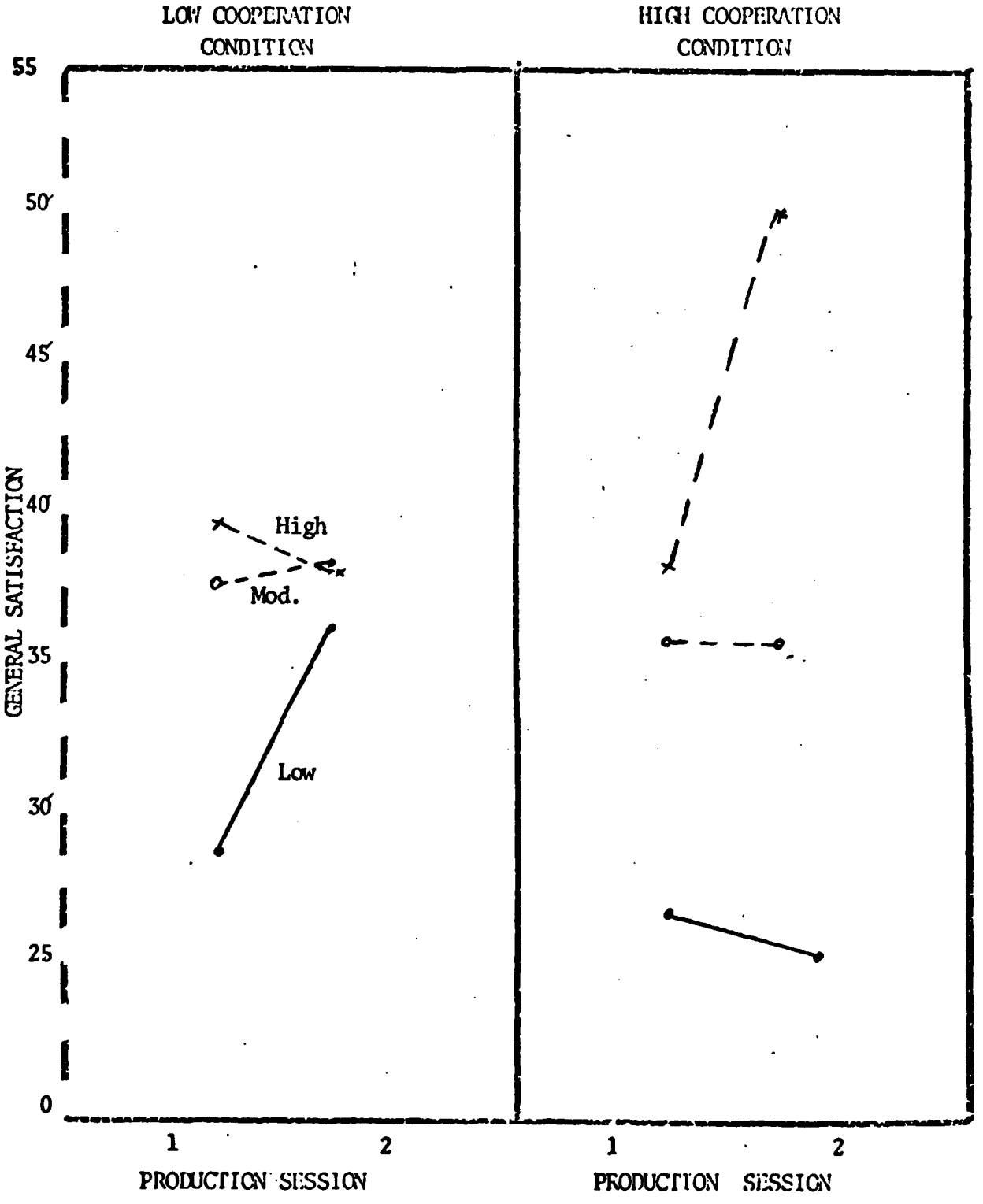

Figure 4. Effect of different levels of compatibility under different cooperation and task experience conditions with intrinsic satisfaction as the dependent variable.

Table 10

Proportion of variance in dependent variables accounted for by treatments and treatment combinations

	Work Credits	Wkr. Perf.. Ratings	Int. Sat.	Ex. Sat.	Gen. Sat.
Coop. Cond.	.04	.07	.00	.02	.00
Task Exp.	.25	.00	.01	.02	.02
Compat.	.00	.10	.16	.25	.25
Coop. Cond. x Task Exp.	.02	.00	.00	.00	.00
Coop. Cond. x Compat.	.02	.00	.05	.03	.06
Task Exp. x Compat.	.00	.00	.00	.00	.00
Coop. Cond. x Task Exp. x Compat.	.03	.00	.04	.01	.04

Hypothesis 1c

This hypothesis predicts that compatibility will influence the degree to which a leader will manifest various behaviors toward his followers. The analyses were based upon the VDL model assumptions and the leader behaviors as measured with the LBDQ, the LBCS, and the BC. Specifically, the hypothesis states:

> Different degrees of leader-follower compatibility will be associated with different levels of leader behaviors.

The means of the different leader behaviors are listed in Table 11.

The first set of results are based upon the LBDQ measures and Hay's (1963, pp. 462-466) procedure for planned comparisons. The differences between the means, in terms of Consideration (C), Tolerance of Freedom (TF), Initiation of Structure (IS), Production Emphasis (PE), and Role Assumption (RA), respectively, were tested.

For C, the mean of the moderate compatibility group, 33.07, was significantly greater than the mean of the low compatibility group, 29.30, $t(87) = 2.73$, $p < .01$. Also, the mean of the high compatibility group, 36.10, was significantly greater than the mean of the moderate group, $t(87) = 2.13$, $p < .05$.

With respect to TF, the moderate compatibility group's mean, 38.76, was significantly greater than that of the low compatibility group, 33.35, $t(87) = 4.09$, $p < .001$. However, the difference between the means of the high and moderate compatibility groups was not significant.

As far as IS was concerned, the moderate compatibility group's mean, 32.65, was not significantly different from that of the low compatibility group, 31.70. However, the mean of the high compatibility group, 36.19, was significantly different from the mean of the moderate group, 32.65, $t(87) = 2.25$, $p < .05$.

For PE and RA, none of the differences between the means of the moderate and low, and high and moderate groups, respectively, were significant.

In summary, the results provide strong support for the hypothesis, when the measures are limited to C. With TF and IS, the results provide only partial support. The results associated with PE and RA do not support the hypothesis. However, in total, the results indicate that compatibility is related to leader behavior.

In terms of BC measures obtained from the followers, both C and S were associated with significant differences between the means of the low, moderate, and high compatibility groups.

For C, the mean of the moderate compatibility group, 14.43, was significantly greater than the mean of the low compatibility group, 11.43, $t(87) = 2.55$, $p < .01$. Also, the mean of the high compatibility group, 17.86, was significantly greater than the mean of the moderate group, 14.43, $t(87) = 2.33$, $p < .05$.

Table 11

Means of leader behaviors associated with compatibility levels

	L	B	D	Q	
LEADER-FOLLOWER COMPATIBILITY	CONSIDERATION	TOLERANCE OF FREEDOM	INITIATION OF STRUCTURE	PRODUCTION EMPHASIS	ROLE ASSUMPTION
HIGH	36.10	39.48	36.19	33.76	38.33
MODERATE	33.07	38.76	32.65	31.85	35.91
LOW	29.30	33.35	31.70	32.17	33.57

	B	C	L	B	C	S
LEADER-FOLLOWER COMPATIBILITY	CONSIDERATION	INITIATION OF STRUCTURE	CONSIDERATION			INITIATION OF STRUCTURE
HIGH	17.86	20.38	22.14			68.33
MODERATE	14.43	16.78	19.46			65.33
LOW	11.43	13.78	16.09			60.65

With respect to S, the moderate compatibility group's mean, 16.78, was significantly greater than that of low compatibility group, 13.78, $t(87) = 2.24$, $p < .05$. The difference between the means of the high compatibility group, 20.38, and the moderate compatibility group, 16.78, was also significant, $t(87) = 2.61$, $p < .01$.

In summary, the results associated with the BC measures that were obtained from the followers provided support for the hypothesis.

When the LBCS measures of C and S served as the dependent variables, there were no significant differences between the group means.

In terms of an overall summary, the results provide partial support for the hypothesis as long as the source of the leader behavior measures is followers. When measures are obtained from external observers, the results do not support the hypothesis.

Hypothesis 2a

This hypothesis predicts that the strength of the observed relationships between leader behaviors and both performance and satisfaction will vary according to whether the data are analyzed in accordance with the VDL approach or the ALS approach. Specifically, it states:

> The correlation between a leader's specific behavior and job performance will be higher under the VDL approach to analysis than under the ALS approach.

The ALS approach expresses leader behaviors in terms of group means that are based upon the observations derived from the followers. In contrast, the VDL approach expresses leader behaviors in terms of each follower's observations of his leader's behaviors. Table 12 contains a summary of the differences in operationalizations of leader behavior in terms of the ALS and VDL approaches.

Although Table 12 accurately represents the typical dependent variable used under either the VDL or the ALS approach to leadership, the ALS model does not need to limit itself to group performance or satisfaction. There is nothing inconsistent between the assumption that leaders hold average styles which they display in a group setting and the conclusion that this average style influences individual behaviors. Therefore, to investigate Hypothesis 2, two ALS analyses were compared to a single set of VDL correlations.

The VDL analysis was based upon the correlation of various leader behaviors with the two measures of the individual follower's performance--work units and the leader's rating of his performance. These correlations were then compared to two sets of ALS correlations. The first set was based on the standard ALS approach. Leader behavior responses from group members were averaged across the three followers and the average ratings were correlated with the average follower performance within the group. Included with the leader behavior measures were the mean ratings of the two observers on the LBCS averaged over the three followers. A second set of ALS

Table 12

Operationalization of Leader Behavior Variables

Instrument and Subscale	Analysis Approach	
	ALS	VDL
1. LBCS (C)	Group mean based upon mean scores derived from observers.	Mean of scores derived from two observers but calculated for each follower.
2. LBCS (IS)	"	"
3. BC (C)	Group mean based upon scores derived from three followers.	Score derived from a single follower.
4. BC (IS)	"	"
5. LBDQ (C)	"	"
6. LBDQ (TF)	"	"
7. LBDQ (IS)	"	"
8. LBDQ (PE)	"	"
9. LBDQ (RA)	"	"

correlations related the mean leader behaviors for a group to the performance of each individual follower. Although this reduced the variance in the leader behavior variable by associating each follower's score within a group to the leader behavior score, the following rationale led to the inclusion of these analyses. It will be recalled that ALS assumes that the differences in follower ratings within a group is error due to the perceptual inadequacies of each follower to see the "true" behavior being displayed. According to this view, the average leader rating should be a more valid measure of the leader's actual behavior. The increase in the validity of the average rating should override the effect on the correlation of a slightly reduced variance in the behavior ratings. Whether or not it does is an empirical question. Therefore, Hypothesis 2a was tested by comparing the difference between the leader behavior-follower performance correlations obtained from the VDL approach to two ALS analyses.

An inspection of the patterns of correlations for Work Session 1 versus Work Session 2 showed no difference in them. Therefore, only the combined correlations are presented in Table 13. Whenever a correlation between a leader behavior rating and a performance measure was significantly different from zero, that correlation was compared to the correlation(s) obtained by the other approach (VDL or ALS) to test whether it was significantly different from it. Support for Hypothesis 2a required that correlations obtained by VDL be significantly higher than those obtained by both of the ALS analyses. An inspection of the significant differences between correlations present in Table 13 shows no support for the hypothesis. When performance was predictable from a given leader behavior using VDL analyses, these analyses never were significantly stronger than either one or both of the ALS correlations between the same behaviors and performance.

Hypothesis 2b

This hypothesis states:

> The correlation between a leader's behavior and job satisfaction will be higher under the VDL approach to analysis than under the ALS approach.

VDL versus ALS comparisons for this hypothesis were similar to those used in Hypothesis 2a; only the output variables were changed. Instead of performance, the three measures of satisfaction obtained from the MSQ were correlated with leader behavior. As was the case with Hypothesis 2a, an inspection of the correlations obtained in Production Sessions 1 and 2 showed very similar patterns. Therefore, the data were combined across sessions and are presented in Table 14.

An inspection of Table 14 shows that the differences in correlations between the individual ratings of leaders and of satisfaction (columns 1, 4, and 7 of Table 14) and the group mean ratings of behavior and of satisfaction (columns 2, 5, and 8 of Table 14) were not significant. It should be noted that although the VDL correlations tended to be significantly different from zero more frequently than the ALS ones based on means, the number significant is not a legitimate basis for comparison due to the large differences in sample size (90 versus 30).

Table 13

Correlations between leader behaviors and follower performance measures:
Data from production sessions 1 and 2 combined

Instrument and Subscale	Work Credits					Rated Performance				
	1[a] VDL (N=84)	2 ALS (N=30)	3[a] ALS (N=84)	Significance of Difference 1vs2	1vs3	4[a] VDL (N=90)	5 ALS (N=30)	6[a] ALS (N=90)	Significance of Difference 4vs5	4vs6
1. LBCS (C)[b]	-.11	.00	-.02			.04	.21	.14		
2. LBCS (IS)[b]	-.48[f]	-.57[f]	-.50[f]	n.s.	n.s.	-.21[d]	-.30	-.15	n.s.	n.s.
3. BC (C)[c]	-.02	-.07	-.07			.02	.08	.04		
4. BC (IS)[c]	.08	.02	.01			-.05	-.24	-.19		
5. LBDQ (C)[c]	.03	.02	.01			-.07	-.14	-.10		
6. LBDQ (TF)[c]	.07	.03	.02			.04	.22	.11		
7. LBDQ (IS)[c]	.04	-.05	-.05			-.07	-.30[d]	-.19		
8. LBDQ (PE)[c]	.22[d]	.32[d]	.29[e]	n.s.	n.s.	-.19	-.28	-.22[d]		n.s.
9. LBDQ (RA)[c]	-.06	-.13	.13			-.13	-.21	.16		

[a] rs represent semipartials with Job Sample Test Scores partialed out of work performance.

[b] Measures obtained from observers.

[c] Measures obtained from followers

[d] $p \leq .05$ two-tailed [e] $p \leq .01$ two-tailed [f] $p \leq .001$ two-tailed

Table 14

Correlations Between Leader Behaviors and Job Satisfaction Measures:
Data from Production Sessions 1 and 2 Combined

Instrument and subscale	Satisfaction Scales: Intrinsic 1 VDL (N=90)	2 ALS (N=30)	3 ALS (N=90)	Significance of difference 1vs2	1vs3	Extrinsic 4 VDL (N=90)	5 ALS (N=30)	6 ALS (N=90)	Significance of difference 4vs5	4vs6	General 7 VDL (N=90)	8 ALS (N=30)	9 ALS (N=90)	Significance of difference 7vs8	7vs9
1. LBCS (C)[a]	.01	-.11	-.05			.01	.15	.10			.03	-.02	-.01		
2. LBCS (IS)[a]	.13	-.14	-.07			.12	.09	.06			.14	-.07	-.04		
3. BC (C)[b]	.22[c]	.05	.02	n.s.	<.05	.51[e]	.45[d]	.30[d]	n.s.	<.01	.32[d]	.05	.09	n.s.	<.0
4. BC (IS)[b]	.26[c]	.11	.05	n.s.	<.05	.66[e]	.66[e]	.44[e]	n.s.	<.001	.41[e]	.31[c]	.17	n.s.	<.0
5. LBDQ (C)[b]	.22[c]	.18	.09	n.s.	<.05	.54[e]	.58[e]	.39[e]	n.s.	<.05	.36[d]	.34[c]	.19	n.s.	<.0
6. LBDQ (TF)[b]	.32[d]	.42[c]	.20	n.s.	n.s.	.35[c]	.43[d]	.29[d]	n.s.	n.s.	.35[d]	.43[d]	.24	n.s.	n.s.
7. LBDQ (IS)[b]	.23[c]	.18	.09	n.s.	<.05	.41[e]	.38[c]	.25[c]	n.s.	<.05	.32[d]	.28	.15	n.s.	<.0
8. LBDQ (PE)[b]	.12	.18	.09			.30[c]	.40[c]	.27[c]	n.s.	n.s.	.19	.26	.15		
9. LBDQ (RA)[b]	.14	.12	.06			.51[e]	.58[e]	.39[e]	n.s.	<.05	.29[d]	.32[c]	.18	n.s.	<.0

a. Measures obtained from observers.

b. Measures obtained from followers.

c. $p \leq .05$ two-tailed.

d. $p \leq .01$ two-tailed.

e. $p \leq .001$ two-tailed.

The second set of VDL to ALS comparisons involved the contrast of the same VDL correlations with the correlations between the average leadership style reported by the members and each individual's satisfaction (column 1 versus 3, 4 versus 6, and 7 versus 9 of Table 14). Fourteen of the 27 comparisons were significantly different from each other and all of them favored the VDL model. Although these data support the VDL model and are consistent with the ALS view in that a leader's behavior should influence each subordinate, it is cautioned that some of the difference may have been due to a restriction in variance in the leader behavior rating for ALS as compared to VDL. Recall that for each individual in the group, the same mean group rating of leader behavior was associated with his satisfaction. VDL did not use the mean; it used each individual rating. Therefore, the variance in VDL leader rating was higher than for ALS. Nevertheless, it was concluded that some support, although weak, did exist for Hypothesis 2b.

Hypothesis 2c

This hypothesis predicts a positive relationship between a leader's homogeneous consideration behaviors and the satisfaction of his followers. Specifically, it states:

> Leaders whose consideration behaviors are homogeneous across followers will have a greater number of satisfied followers than leaders whose consideration behaviors are heterogeneous across followers.

This hypothesis was tested by using the chi-square test. The data were the leader Consideration (C) scores that were obtained from each follower as he completed the BC, and the intrinsic, extrinsic, and general satisfaction scores from each follower.

The C scores from the three followers in a work group were used to compute the standard deviation of the leader's consideration behavior scores which, in turn, was assumed to represent the degree to which the leader varied his consideration behaviors when interacting with his followers. As an example, if the leader's consideration behaviors were homogeneous across his followers, then each follower should give him similar consideration scores. On the other hand, if the leader's consideration behaviors varied widely with respect to each of his followers, their consideration scores should also vary widely. The standard deviations of all work groups were then subjected to a median split. This procedure was followed for the data in terms of each production session. The scores above the median were assumed to identify a leader whose consideration behaviors were heterogeneous and the scores below the median were assumed to identify a leader whose consideration behaviors were homogeneous.

The follower's intrinsic, extrinsic, and general satisfaction scores were trichotomized into three categories. The scores at or below the thirty-third percentile point in each distribution were assumed to identify a follower who was not very satisfied. The scores at or above the sixty-seventh percentile point were assumed to represent a follower who was highly satisfied. The scores that fell between these two percentile points were postulated to identify moderately satisfied followers. The cut-off points for the data from the first and second production sessions are listed in Appendix AA.

The chi-square test based upon the data from the first and second production sessions resulted in no significant findings. However, the chi-square for intrinsic satisfaction ($X^2(2) = 5.57$, $p = .06$) and the chi-square for general satisfaction ($X^2(2) = 5.10$, $p = .08$), both based upon first production session data, approached the .05 significance level. In sum, the results do not support Hypothesis 2c.

Hypothesis 2d

This hypothesis states that followers are more productive if their leaders are heterogeneous with respect to their Initiation of Structure (IS) behaviors. Specifically, it states:

> Leaders whose initiating structure behaviors are heterogeneous across followers will have a greater number of highly productive followers in comparison to leaders whose structuring behaviors are homogeneous across followers.

The hypothesis was tested by using the chi-square test. The data were the leader's IS scores that were obtained from the followers via the BC, and the work credits that were awarded to each follower.

The IS scores were subjected to the same operationalization steps that were applied to the C scores. The scores above the median were assumed to represent a leader whose IS behaviors were heterogeneous across his followers while scores below the median were assumed to represent leaders who were homogeneous in terms of their IS behaviors.

The work credits were trichotomized into low, moderate, and high productivity categories, in the same fashion as had been done for the satisfaction scores.

The work chi-square tests did not result in any significant results. Thus, Hypothesis 2d was not supported.

Hypothesis 3

This hypothesis states:

> Measures of leader behavioral style that are obtained from followers will differ from identical measures that are obtained from external observers.

The degree to which observers and group members agreed on the leader's behavior was calculated by correlating leader behavior descriptions obtained from members with those from observers. Two sets of comparisons were possible based upon the focus of the observer ratings. First, observers rated leader behavior toward each member, using the LBCS. These ratings were correlated with the four leader-behavior measures obtained from each individual group member. Table 15 shows that there were no significant correlations between observers and members on these ratings. For the BC, members rated the same 14 behaviors that the observers rated on the LBCS. Yet, even

in this case, the correlations were only .17 for C and .13 for IS and both were not significantly different from zero. Since the observer ratings were based on the average between two observers and both of them showed an extremely high degree of agreement on the behavior displayed (see the Method Section), the low correlations appeared to be primarily a function of the group members' inability to objectively rate leader behavior.

Table 15 also indicates that observers were better able to distinguish between IS and C behaviors than were members. For observers, the intercorrelation between IS and C was only .27 compared to a correlation of .75 on the BC and .41 on the LBDQ scales for members.

Observers also rated the leaders' behavior on the same two scales as did the members (the BC and the LBDQ). The ratings were obtained at the conclusion of each work session. Since the BC and the LBDQ ratings were done only once for each group, the average of the group member ratings on the BC and LBDQ were calculated and correlated with the average of the two observer ratings on the same two scales. Table 16 shows the agreement between observer and member ratings of similar behaviors on both the same and different scales. In all cases, the observer and member ratings of similar behaviors were significantly different from zero (the italicized correlation coefficients in Table 16). The average intercorrelation of similar behavior ratings was $\bar{r}$ = .51, based upon r to Z transformations, with the average for IS being slightly higher than the average for C ($\bar{r}$ = .57 vs. $\bar{r}$ = .45 respectively). The group data were considerably stronger than the individual data, indicating that the averaging process across group members may cancel out some of the perceptual biases on individual group members. Finally, in contrast to the LBCS measures of Table 15, the observers were no more capable than members of independently rating the two types of leader behavior on the BC or the LBDQ scales.

DISCUSSION

The general purpose of the research was to systematically study leader behavior while assessing the interactive effects of leader characteristics, follower characteristics, and the task situation. The specific foci of the investigation looked at (1) the degree of compatibility between the leader and his followers, (2) the VDL versus the ALS analysis of leader behavior, and (3) the general problem of assessing leader behavior on the basis of subordinate description. Each one of these topics is discussed below.

Compatibility

Compatibility between the leader and the subordinate was investigated as it interacted with cooperation condition and task experience to affect follower performance and satisfaction was well as their perceptions of the leader's behavior. The results indicated that increased performance was related to increases in the degree of compatibility between the followers and the leaders, but that this was only true when subjective estimates of performance, obtained from the leader, were used. Objective performance, the number of work credits awarded, did not relate to compatibility.

Table 15

Intercorrelations of Measures of Leader Behaviors Toward Individual Members Obtained from Observers and from Members[a]

	1	2	3	4	5	6
1. Observer Ratings of Consideration from LBCS		.27[c]	.17	.07	.09	-.12
2. Observer Ratings of Initiation of Structure from LBCS			-.04	.13	-.02	.04
3. Member Ratings of Consideration from BC				.75[c]	.71[c]	.50[c]
4. Member Ratings of Initiation of Structure from BC					.73[c]	.59[c]
5. Member Ratings of Consideration on LBDQ						.41[c]
6. Member Ratings of Initiation of Structure on LBDQ						

[a] N = 90

[b] $\alpha \leq .05$

[c] $p \leq .01$

Table 16

Intercorrelations of the Leader Behavior Measures Based Upon Ratings Summarized Over Groups (N = 30)

	Observers				Members			
	BC(C)	BC(IS)	LBDQ(C)	LBDQ(IS)	BC(C)	BC(IS)	LBDQ(C)	LBDQ(IS)
Observer Ratings								
BC(C)		.70[a,c]	.91[a,c]	.68[a,c]	.45[c]	.40[b]	.36[b]	.41[b]
BC(IS)			.71[a,c]	.80[a,c]	.35[b]	.59[c]	.44[b]	.54[c]
LBDQ(C)				.76[a,c]	.54[c]	.50[c]	.42[b]	.55[c]
LBDQ(IS)					.25	.45[c]	.28	.69[c]
Member Ratings								
BC(C)						.67[c]	.74[c]	.44[b]
BC(IS)							.78[c]	.60[c]
LBDQ(C)								.34
LBDQ(IS)								

[a] Same rs as presented in Table 1.

[b] $p \leq .05$.

[c] $p \leq .01$.

Although it is of interest that effects of compatibility were consistent across cooperation condition and task experience, indicating that compatibility effects were not moderated by the situation, the results may be more pertinent to the understanding of performance ratings than compatibility. Recall that compatibility, originally defined in terms of leader-follower dominance matches, ultimately was defined by the degree to which leaders and followers were mutually attracted to each other. Thus, the finding that performance ratings covaried with compatibility reflects the fact that the leaders rated the performance of those subordinates they liked on an interpersonal basis, higher on performance than those they did not like. This higher performance rating occurred in spite of the fact that the leaders were well aware of the followers' actual performance in the present setting. Just prior to completing the performance ratings, the leaders had filled out an Employee Pay Record which required them to record the actual number of work credits awarded to each follower. It is frequently stated that superior performance ratings of subordinates may reflect interpersonal attraction, especially in settings where objective performance data are not available due to the nature of the job. The present data suggest that this contamination may be more serious than had previously been suspected because, in this setting, objective performance data were available to the leader and it is reasonable to assume that he was aware of it.

Turning to the satisfaction results, the data strongly supported the contention that leader-follower compatibility is related to the satisfaction of followers with several facets of the work environment. However, the reader is again cautioned that the strength of the association is somewhat tempered by the post hoc definition of compatibility which was bound to reflect, to some degree, satisfaction. Nevertheless, the strength of the findings lead to the conclusion that it is unlikely that the contamination of the compatibility variable would not have been responsible for most of the observed covariation.

The most straight-forward of the satisfaction relationships occurred with the extrinsic satisfaction. In this case, satisfaction was a monotonically increasing function of increasing compatibility. The more satisfied the follower, the higher was leader-follower compatibility. Furthermore, this relationship held regardless of cooperation condition. Since one of the subscales of the extrinsic satisfaction scale was that of satisfaction with the supervisor, the results indicated that more compatible leaders and subordinates had subordinates who were more satisfied with their leader. However, the strong positive relationship was due to more than supervision satisfaction which indicates that under conditions of high compatibility there may have been a tendency for satisfaction to generalize to satisfaction with other elements of the work environment. This interpretation implies a causal link between compatibility and satisfaction, which, of course, is not justified from a correlational design. Therefore, an equally plausible explanation is that satisfaction with the extrinsic features in the job environment led to the perception of a greater degree of compatibility between the leader and his follower. Regardless of the direction of causality, it is reasonable to conclude that compatibility between a leader and his follower is a positive attribute in the leadership setting and that it is associated with a greater degree of member satisfaction with the extrinsic job outcomes.

Intrinsic satisfaction as well as general satisfaction results led to the same general conclusions reached about extrinsic satisfaction, with one exception. For both of the measures, the degree of cooperation required by the task and the amount of experience with the task moderated the effect of compatibility. When group members worked very independently, compatibility was related to intrinsic satisfaction only during the initial stages of group interaction. This result is very understandable when it is recalled that the followers working independently had no other followers with whom to share the task. Therefore, in the early stages of the experiment, they had to rely heavily on their interaction with the leader (the expert on the task) to master the construction of "origami" cranes. It was during this stage that their satisfaction with intrinsic job outcomes was correlated with the leader behavior which was crucial for task accomplishment. Furthermore, since intrinsic satisfaction is that which is most closely tied to the task--e.g., feeling that you have done a good job--both compatibility and intrinsic satisfaction were linked through task accomplishment. In later stages of the work (Session 2), the follower no longer needed the leader to accomplish the task and, therefore, no longer saw any link between his intrinsic satisfaction and the leader. General satisfaction followed this same pattern primarily because a large component of it was intrinsic satisfaction.

The final set of compatibility analyses dealt with the relationship between it and the follower's perceptions of leader behavior. In general, the interpersonally oriented behaviors (Consideration and Tolerance for Freedom) were positively related to compatibility as predicted and the task-oriented ones were not, with the exception of Initiation of Structure. In this case, followers in the most compatible leader-follower dyads saw their leaders as significantly more structuring than did those on the lower compatibility conditions. Most likely, this was due to the high learning orientation of the work groups and the leader's possession of expert power. Followers had to interact a lot with their leaders to accomplish this task. Furthermore, this interaction was, on the average, very task-oriented and, therefore, very high on Initiation of Structure. Since those followers who were more compatible with their leader also interacted more than others with him and since the interaction was heavily composed of structuring behavior, it is understandable why the more task-related IS behaviors covaried with compatibility. These data also support the conclusion that followers do not attribute negative affect to those leaders they see as structuring in settings that are very task-oriented and in ones where pay is contingent upon high task performance.

In conclusion, it is evident that compatibility in the leader-member dyad is an important element in the group setting. It is related to performance ratings, satisfaction, and the leader behaviors perceived by group members. However, the strength of the observed relationship must be tempered by the post hoc nature of the compatibility measure.

VDL Versus ALS

The data offered little statistical support for the superiority of either the VDL or the ALS approach to the understanding of leader behavior effects on

member or group responses. The most appropriate comparison of the two methods--individual ratings of leader-member behaviors correlated with individual performance and satisfaction for VDL and group mean ratings with mean performance and satisfaction--showed no significant differences between comparable correlations. Only when VDL correlations were compared to the correlation of group mean behaviors with individual responses did the VDL model prove superior. However, the restriction of variance in the mean ratings for ALS, due to the use of the same rating for each group member along with the fact that this was a less appropriate construal of the ALS model, made this a very weak comparison.

Further reflection upon the ALS versus VDL comparison has led the author to conclude that the two cannot be compared solely on the basis of the statistical difference between correlations. This criterion is in some ways inappropriate and in others too stringent. The first criterion on which to judge the two models is that of the purpose to which the data are to be put. For example, if one is interested in the general effects of leader behavior on group outputs for such reasons as advising and training leaders then the ALS model is more appropriate provided there are no interactions with member characteristics within groups that would nullify the general conclusions based upon group data. If, on the other hand, one is interested in understanding the effects of leader behavior on member responses under the general assumption that the group outputs are primarily the sum of member responses, then the VDL model is more appropriate. This choice of model is not to be made on its statistical superiority but, rather, upon its appropriateness for the issue at hand. Unfortunately, in the past, the ALS model has been applied to both the above conditions. Furthermore, most of the interest has been in the latter case, understanding the effects of leader behavior on subordinates, rather than the former so the model has very frequently been used instead of the more appropriate VDL one.

A second argument for the use of a VDL model over an ALS one where both might prove to be reasonable is purely a pragmatic one. The data indicated that considerably more of the VDL correlations were statistically different from zero than were the ALS ones based on group means. Although this difference in frequency of statistical significance was due primarily to differences in sample size, in exploratory studies of leader behavior, the VDL model should produce more significant results which would be pursued by the investigators. ALS models, due to the reduced sample size, may miss relationships that would be worthy of pursuit due to the failure of the statistic used to reach significance. Although the consideration of the power of the statistical procedures under each model should not be weighted as heavily as the logical appropriateness for the selection of a model for the study of leader behavior, the increased power of the VDL model should not be ignored.

Assessment of Leader Behavior

The data presented here demonstrated that the typical source of leader behavior descriptions, the individual members of the group, cannot provide valid ratings of the leader's behavior toward individual subordinates. Only when leader behavior descriptions were averaged across group members was it possible to observe some convergency between the descriptions from group members with those reported by independent observers of the leader's behavior.

Unfortunately, the same averaging process which increased the validity of the ratings made it impossible to obtain the necessary descriptions to study the leader behaviors toward each group member.

Clearly, if we are to study the leader's behavior toward individual subordinates, and if the subordinates cannot be relied upon to give valid descriptions of this behavior, other research strategies must be considered. The simplest procedure would be to focus on subordinate perceptions rather than leader behavior. Since subordinates' reactions to their leader depend upon their perceptions of him, it is important to understand these perceptions. Fleishman (1973), in his concluding remarks to the Southern Illinois Leadership Conference, emphasized the need to realize that most leadership behavior studies dealt with subordinate perceptions rather than "actual" leader behavior. Similarly, Graen et al. (1972) were careful to limit interpretation of their data to the effects of member perceptions, not actual leader behavior.

Perceptual emphasis would suggest an expanded focus on the antecedents of perceiving a leader as considerate or initiating of structure as well as the more typical emphasis upon the relationship between perceived leader behaviors and member responses. Such antecedents as the past experience and other individual difference characteristics of the leader and the member on nontask-related variables (e.g., attitudes and interests), actual leader behaviors, and situational demands might be considered.

To pursue the sources of member perceptions quickly leads to the same problem faced by the study of leader behavior effects on member responses which ignore perceptions--the need to assess actual leader behavior. One solution to this problem is to study leader behavior under more controlled conditions than are possible in the field. Simulations similar to or more elaborate than the one reported here provide an excellent method to study small group behavior (Fromkin & Streufert, 1972). It offers the control needed for systematic observation plus, depending upon the fidelity of the simulation, the realism and the involvement from participants necessary for external validity. In such settings, leader behavior could be recorded by independent observers, videotaped, or filmed for coding later. In this way, it would not be necessary to rely on subordinate responses for descriptions of leader behavior.

Regardless of the emphasis on controlled experimentation, most leadership research will be carried out in the field. Therefore, it will be necessary to obtain multiple observations of the dyadic leader-to-member behaviors if valid measures of leader behaviors are to be obtained. Obviously in the group, only two sources exist for these ratings--the leader and the group members. One strategy would be to consider as "actual" behaviors of a leader toward a member only those which the leader agrees he displayed and the member also agrees occurred. However, past research has found little correlation between member and leader descriptions of leader behavior which leads to little hope for a large set of agreed upon behaviors (Stogdill, 1974; Wood, 1972).

A second approach would be to have more than one group member describe the behavior of a leader toward a specific member. In small groups, every

member could rate the leader's behavior toward every other group member. Obviously, as the number of persons in the group increases, the opportunity to observe the leader's behavior toward each member may decrease, depending upon the setting; certainly the number of ratings to be filled out by each person quickly becomes unmanageable. Under such conditions subsets of members would have to be used to describe each dyadic relationship. It has been shown that members can agree upon general behaviors of the leader toward individual members to be in his "in group" (Dansereau, Graen, & Haga, 1975); it remains to be seen whether agreement also exists on descriptions of Consideration and Initiation of Structure behavior toward a specific member.

Regardless of the research strategy undertaken, it seems clear that little progress can be made by relying exclusively upon subordinate ratings of his leader's behavior toward him. Compelling reasons do exist for studying the dyadic leader-member interactions as have been described by Graen and his students (Dansereau, et al., 1973; Graen et al., 1972), as well as by the path-goal models of House (1971, 1973) and Evans (1970). Research must be undertaken to provide more accurate information about the leader-member behavior in the dyad.

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APPENDIX A

INSTRUCTIONS(LC)*--SUPERVISOR'S ROLE

You will be playing the role of a supervisor in the Special Products Division of the Boilermaker Greeting Card Company. The branch in which you are working specializes in custom-made cards and is presently involved in the production of "origami" paper cranes.

As a supervisor you are responsible for the three workers on your production team. Your specific duties are to:

(1) Provide technical assistance to your workers;

(2) Keep your team supplied with paper that is issued by the Supply Clerk;

(3) Deliver finished cranes to the Quality Control Inspector who will inspect them in accordance with company quality standards (Attachment 1);

(4) Decide whether a rejected crane should be reworked or scrapped;

(5) Evaluate the performance of each of your workers;

(6) Maintain the employee production and pay records (BGCC Form 1) which are to be turned in to the Branch Manager at the end of the production session;

(7) Consult with the Branch Manager on major production or personnel problems which can't be handled by normal procedures; and

(8) Brief your team members (before the start of the production session) on the following points:

(a) Due to current company policy, each worker must produce a complete crane on his own. In other words, there can be no specialization on the specific steps that make up the overall task;

(b) The most productive team, during the entire study, will receive a bonus of $25.00 which will be divided among the supervisor and his team members in whatever manner the group decides upon; and

(c) When tbe production session ends, each worker will be permitted to continue working on his last crane until he completes Step 9, Step 19, or Step 30 of INSTRUCTIONS (LC)--WORKER ROLE.

Union policy prohibits you from making cranes.

You will be paid $2.65 per hour during the production sessions and $2.00 per hour for the other phases of the study.

In acting you part, accept the facts and assume the attitude supplied in your specific role. From this point on, let your feelings develop in accordance with the events that transpire in the role playing process. When facts or events are consistent with the way it might be in a real-life situation.

Return this set of instructions and those of your workers to the manager at the end of the production session. Your manager will tell you when to begin.

*Low Cooperation Condition.

QUALITY CONTROL STANDARDS

1. NECK AND TAIL ANGLES. The crane's neck and tail must protrude outward at an angle of 45 degrees from the body. Use the plastic triangle to check for the proper angle. A crane with two angles that are exactly 45 degree will be given 20 points--10 points for the neck and 10 points for the tail angle. Any angle that is three degrees greater than or less than the standard 45 degrees will be given between one to nine points based upon your judgment. Any deviation of plus or minus 5 degrees, from the 45 degree standard, will be grounds for rejecting the crane.

2. WING TIPS. The tips of the crane's wings must come to a sharp point and the space on the underside of each wing must be less than $\frac{1}{4}$ inch. A perfect wing will be awarded 10 points each. Thus, two perfect wings will be awarded a total of 20 points.

3. GENERAL OVERALL NEATNESS. Neatness will be awarded a maximum of 10 points. Deduct points for torn or ragged edges.

SCORING

1. Total Possible Points: 50 points.

2. Total up the points you have awarded for the various quality control checkpoints. If a crane earns <u>less than 40 points</u>, <u>reject it</u> and <u>return it</u> to the appropriate supervisor with the reasons for rejection.

3. If a crane earns 40 or more points, it will be accepted and stored in the paper sacks that are provided.

Attachment 1

INSTRUCTIONS(LC)*--WORKER'S ROLE

You will be playing the role of a worker in the Special Products Division of the Boilermaker Greeting Card Company. The branch in which you are working specializes in custom-made cards and is presently involved in the production of "origami" paper cranes.

As a production team member, your job is to make cranes from sheets of paper. Instructions are provided in Attachment 1.

A Quality Control Inspector will check all cranes and reject those that do not meet the quality standards (Attachment 2).

For each white crane that meets the quality standards, you will be awarded three work credits. For each work credit you will be paid 12 cents. Thus, for each crane that passes the quality inspection, you will earn 36 cents. This piece rate system will be in effect during the production session. During the other phases of the study you will be paid a flat rate of $2.00 per hour.

In acting your part, accept the facts and assume the attitude supplied in your specific role. From this point on, let your feelings develop in accordance with the events that transpire in the role playing process. When facts or events arise that are not covered by the role, make up things which are consistent with the way it might be in a real-life situation.

Return this set of instructions to your supervisor at the end of the production session. Your supervisor will tell you when to begin.

*Low Cooperation Condition.

INSTRUCTIONS(LC)*--CONSTRUCTION TASK

1. "Square" a sheet of white paper by folding it diagonally.
2. Cut off the excess paper by using the edge of the ruler. You want to obtain a neat clean cut. You want to end up with a square piece of paper that is exactly $8\frac{1}{2}$ inches on each side.
3. Fold the square sheet of paper in half (see Attachement 1-a for Steps 3 through 9).
4. Fold the upper left corner back. Place a crease along the line created by the fold.
5. Fold the upper right corner toward you. Place a crease along the line created by the fold.
6. "Open up" the triangular form so it forms a diamond-shaped form.
7. Place the diamond-shaped form on the work surface and crease the lines created by the folds.
8. Fold the bottom half of the outside flap upward. Place a crease along the line created by the fold.
9. Turn the diamond-shaped form over. Do the same as in the previous step.
10. Starting with the diamond-shaped form, fold along dotted line "X," then bring the outside edge of the right flap toward the middle. Place a crease along the line created by the fold (see Attachment 1-b for Steps 10 through 19).
11. Fold along dotted line "Y," then bring the outside edge of the left flap toward the middle. Place a crease along the line created by the fold.
12. Turn the diamond-shaped form over.
13. Repeat Step 10.
14. Repeat Step 11.
15. Fold the top portion of the diamond along line "A." Place a crease along the line created by the fold.
16. Unfold the top portion of the diamond.
17. Open the flaps that were folded in Steps 13 and 14.
18. Using the crease along line "A" as a hinge, pull point "e" away from line "A." Use your fingers to ease the outer edges toward the middle as illustrated in the picture.
19. Turn the form over and repeat Step 18.
20. Place the "basic form" on the work surface so the triangular-shaped flaps that are free to move are at the bottom.
21. Fold the lower right flap along line "A" and bring the outer edge of the flap toward the middle. Place a crease along the line created by the fold. (see Attachment 1-c for Steps 21 through 30).
22. Fold the lower left flap along line "B" and bring the outer edge of the flap toward the middle. Place a crease along the line created by the fold.
23. Turn the form over.
24. Repeat Step 21.
25. Repeat Step 22.
26. Fold the narrow triangular flap along line "C," bringing the tip of the triangle upward. Place a crease along the line created by the fold.

Attachment 1

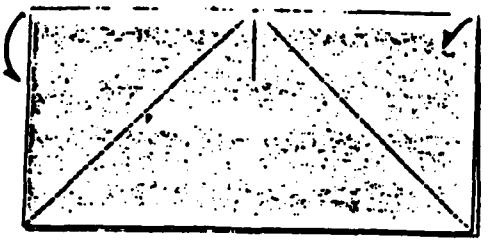
INSTRUCTIONS(LC)*--CONSTRUCTION TASK(Continued)

27. Fold the narrow triangular flap along line "D," bringing the tip of the triangle upward. Place a crease along the line created by the fold.
28. Return the lower right flap to its original position, then fold it upward turning it "outside in" to form the crane's neck. Fold the point down, turning it "outside in" at the same time, to make the crane's head. Use the protractor to obtain the 45-degree angles.
29. Return the lower left flap to its origianal position then fold it upward turning it "outside in" to form the crane's tail. Use the protractor to obtain the 45-degree angle.
30. Fold the crane's wings outward and blow air into the hole at the bottom to inflate the crane's body. The supervisor will collect all completed cranes.

*Low Cooperation Condition.

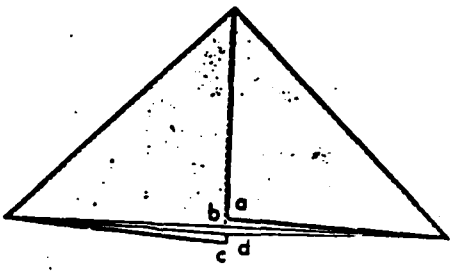
Attachment 1

3, 4, 5



First fold a square sheet of paper in half, and then fold the upper left corner back and the upper right corner forward along the dotted lines.

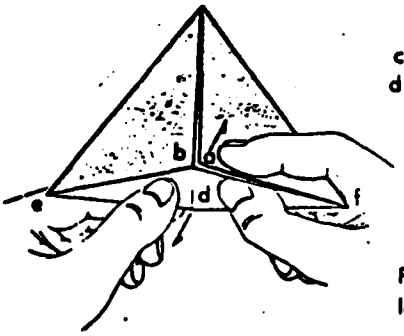
5

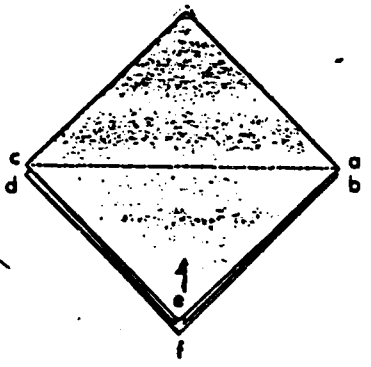


Fold the paper, bringing Points *a* and *b* rightwards, and Points *c* and *d* leftwards as shown in Step 6

6, 7, 8

6

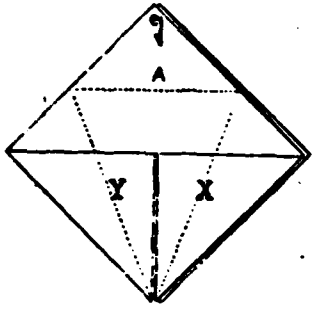




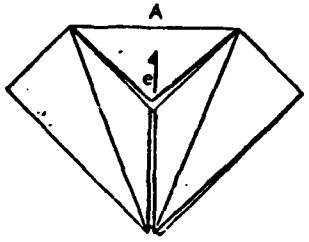
Fold the bottom half of the outside leaf up.

Attachment 1-a

10, 11--13, 14

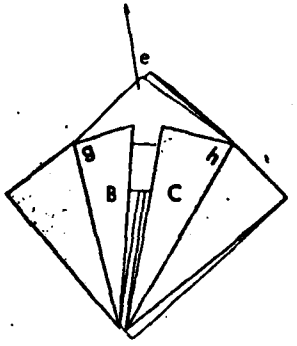


15



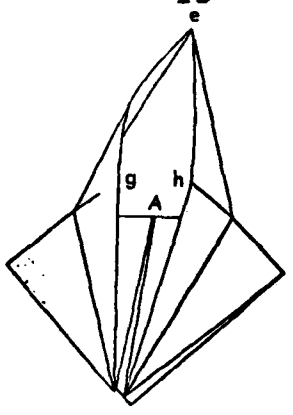
Fold the top leaves, bringing the two edges to the middle. Crease along dotted line A and unfold it to make Step 18 easier.

16, 17

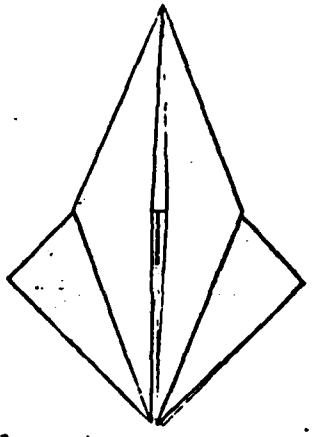


Open the top two flaps B and C, then fold along creased line A, pulling Point e in the direction shown by the arrow and the two edges to the middle as shown.

18

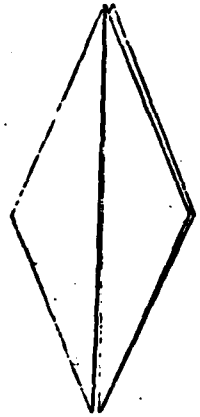


18



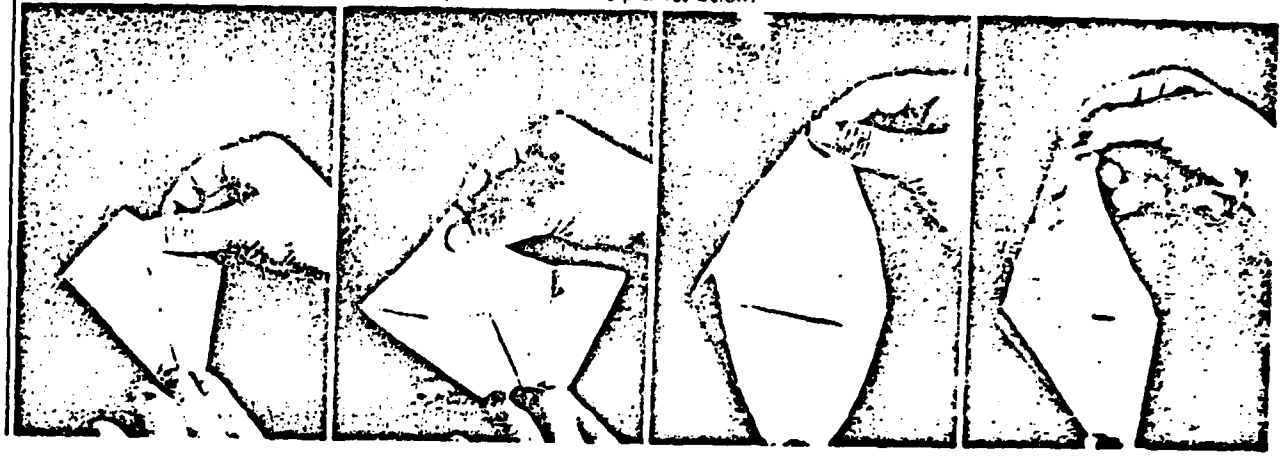
Repeat the same process on the reverse side to complete the basic form.

19



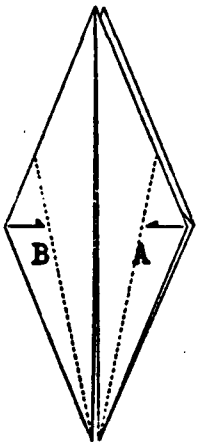
Attachment 1-b

Steps 16-18 are rather difficult, therefore please examine the pictures below.



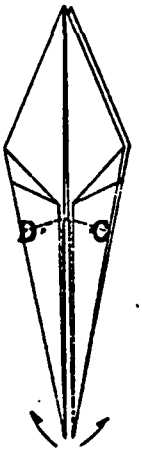
Using the basic form, the crane, Japan's most popular Origami, is easily folded.

20, 21, 22



Fold the paper on the dotted lines on both sides, front and back

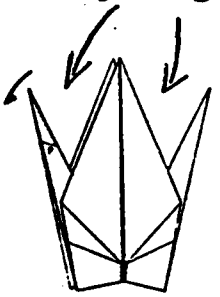
26, 27



Fold the lower ends up, turning them "outside in" at the same time.

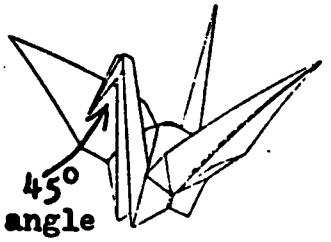
28

45° angles



Fold the left point down, turning it "outside in" at the same time to make the crane's head.

29, 30



Fold the crane's wings outwards and blow air into the hole at the bottom to inflate the crane.

Attachment 1-c

QUALITY CONTROL STANDARDS

1. NECK AND TAIL ANGLES. The crane's neck and tail must protrude outward at an angle of 45 degrees from the body. Use the plastic triangle to check for the proper angle. A crane with two angles that are exactly 45 degree will be given 20 points--10 points for the neck and 10 points for the tail angle. Any angle that is three degrees greater than or less than the standard 45 degrees will be given between one to nine points based upon your judgment. Any deviation of plus or minus 5 degrees, from the 45 degree standard, will be grounds for rejecting the crane.

2. WING TIPS. The tips of the crane's wings must come to a sharp point and the space on the underside of each wing must be less than $\frac{1}{4}$ inch. A perfect wing will be awarded 10 points each. Thus, two perfect wings will be awarded a total of 20 points.

3. GENERAL OVERALL NEATNESS. Neatness will be awarded a maximum of 10 points. Deduct points for torn or ragged edges.

SCORING

1. Total Possible Points: 50 points.

2. Total up the points you have awarded for the various quality control checkpoints. If a crane earns <u>less than 40 points</u>, <u>reject it</u> and <u>return it</u> to the appropriate supervisor with the reasons for rejection.

3. If a crane earns 40 or more points, it will be accepted and stored in the paper sacks that are provided.

Attachment 2

APPENDIX B

INSTRUCTIONS(HC)*--SUPERVISOR'S ROLE

You will be playing the role of a supervisor in the Special Products Division of the Boilermaker Greeting Card Company. The branch in which you are working specializes in custom-made cards and is presently involved in the production of "origami" paper cranes.

As a supervisor you are responsible for the three workers on your production team. Your specific duties are to:

(1) Provide technical assistance to your workers;

(2) Keep your team supplied with paper that is issued by the Supply Clerk;

(3) Deliver finished cranes to the Quality Control Inspector who will inspect them in accordance with company quality standards (Attachment 1);

(4) Decide whether a rejected crane should be reworked or scrapped;

(5) Evaluate the performance of each of your workers;

(6) Maintain the employee production and pay records (BGCC Forms 2, 3 and 4) which are to be turned in to the Branch Manager at the end of the production session;

(7) Consult with the Branch Manager on major production or personnel problems which can't be handled by normal procedures; and

(8) Brief your team members (before the start of the production session) on the following points:

(a) Due to company policy, each worker will be required to produce a specific portion of a complete crane. In other words, each team member will specialize in a segment of the total task that is required to produce a complete crane;

(i) Worker #1 will be responsible for the first nine steps in the entire folding process. When Worker #1 completes his portion of the total task, he will send his diamond-shaped form to Worker #2;

(ii) Worker #2 will be responsible for the steps that convert the diamond-shaped form into the "basic form." When Worker #2 completes his portion of the total task, he will send his "basic form" to Worker #3;

(iii) Worker #3 will be responsible for the steps that convert the "basic form" into a finished crane. When a crane is completed, Worker #3 will print the last names of all three team members upon the upper surface of the right wing. This will enable the inspector to give credit to all team members.

(b) In the event Worker #1 is unable to provide a sufficient number of <u>white</u> diamond-shaped forms to keep Worker #2 busy, Worker #2 may turn to the reserve pile of <u>blue</u> diamond-shaped forms. There is a large difference in the pay rates for white and blue forms. The differences are discussed in Worker #2's instructions.

(c) In the event Worker #2 is unable to

provide a sufficient number of white or blue forms to keep Worker #3 busy, Worker #3 may turn to the reserve pile of pink basic forms. There is a large difference in the pay rates for white, blue, and pink forms. The differences are discussed in Worker #3's instructions.

(d) Based upon your judgment, designate your team members as Worker #1, Worker #2, and Worker #3. The workers' job sample scores and the worker instructions may assist you in deciding who should be assigned to each segment of the total task.

(e) The most productive team, during the entire study, will receive a bonus of $25.00 which will be divided among the supervisor and his team members in whatever manner the group decides upon; and

(f) When the production session ends, each worker will be permitted to continue working until he completes his segment of the total construction task.

Union policy prohibits you from making cranes.

You will be paid $2.65 per hour during the production sessions and $2.00 per hour for the other phases of the study.

In acting your part, accept the facts and assume the attitude supplied in your specific role. From this point on, let your feelings develop in accordance with the events that transpire in the role playing process. When facts or events arise that are not covered by the role, make up things that are consistent with the way it might be in a real-life situation.

Return this set of instructions and those of your workers to the Manager. Your Manager will tell you when to begin.

*High Cooperation Condition.

QUALITY CONTROL STANDARDS

1. NECK AND TAIL ANGLES. The crane's neck and tail must protrude outward at an angle of 45 degrees from the body. Use the plastic triangle to check for the proper angle. A crane with two angles that are exactly 45 degree will be given 20 points--10 points for the neck and 10 points for the tail angle. Any angle that is three degrees greater than or less than the standard 45 degrees will be given between one to nine points based upon your judgment. Any deviation of plus or minus 5 degrees, from the 45 degree standard, will be grounds for rejecting the crane.

2. WING TIPS. The tips of the crane's wings must come to a sharp point and the space on the underside of each wing must be less than $\frac{1}{4}$ inch. A perfect wing will be awarded 10 points each. Thus, two perfect wings will be awarded a total of 20 points.

3. GENERAL OVERALL NEATNESS. Neatness will be awarded a maximum of 10 points. Deduct points for torn or ragged edges.

SCORING

1. Total Possible Points: 50 points.

2. Total up the points you have awarded for the various quality control checkpoints. If a crane earns <u>less than 40 points</u>, <u>reject it</u> and <u>return it</u> to the appropriate supervisor with the reasons for rejection.

3. If a crane earns 40 or more points, it will be accepted and stored in the paper sacks that are provided.

Attachment 1

INSTRUCTIONS(HC)*--WORKER #1'S ROLE

You will be playing the role of a worker in the Special Products Division of the Boilermaker Greeting Card Company. The branch in which you are working specializes in custom-made cards and is presently involved in the production of "origami" paper cranes.

As a production team member, your job is to make a portion of a crane. Instructions are provided in Attachment 1.

A Quality Control Inspector will check all cranes and reject those that do not meet the quality standards (Attachment 2).

For each white diamond-shaped form that you complete, you will be credited with one work unit. For each work unit that meets the quality standards you will be paid 12 cents. This piece rate system will be in effect during the production session. During the other phases of the study you will be paid a flat rate of $2.00 per hour.

In acting your part, accept the facts and assume the attitude supplied in your specific role. From this point on, let your feelings develop in accordance with the events that transpire in the role playing process. When facts or events arise that are not covered by the role, make up things which are consistent with the way it might be in a real-life situation.

Return this set of instructions to your supervisor at the end of the production session. Your supervisor will tell you when to begin.

*High Cooperation Condition.

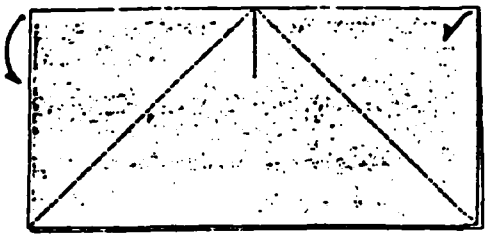
INSTRUCTIONS(HC)*--WORKER #1: CONSTRUCTION TASK

1. "Square" a sheet of white paper by folding it diagonally.
2. Cut off the excess paper by using the edge of the ruler. You want to obtain a neat clean cut and end up with a square piece of paper that is exactly $8\frac{1}{2}$ inches on each side.
3. Fold the square sheet of paper in half (see Attachment HC-W#1 for Steps 3 through 9).
4. Fold the upper left corner back. Place a crease along the line created by the fold.
5. Fold the upper right corner toward you. Place a crease along the line created by the fold.
6. "Open up" the triangular form so it forms a diamond-shaped form.
7. Place the diamond-shaped form on the work surface and crease the lines created by the folds.
8. Fold along the bottom half of the outside flap upward. Place a crease along the line created by the fold.
9. Turn the diamond-shaped form over. Do the same as in the previous step.
10. This ends your portion of the construction task. Hand the diamond-shaped form to Worker #2.

*High Cooperation Condition.

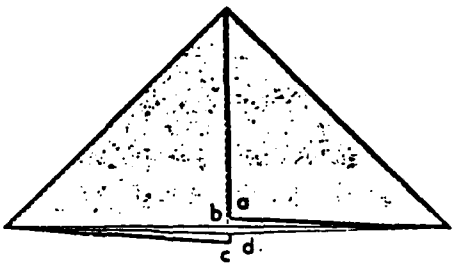
Attachment 1

3, 4, 5



First fold a square sheet of paper in half, and then fold the upper left corner back and the upper right corner forward along the dotted lines.

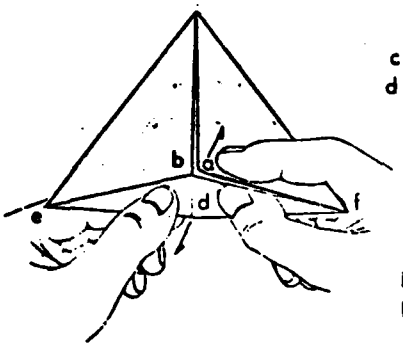
5

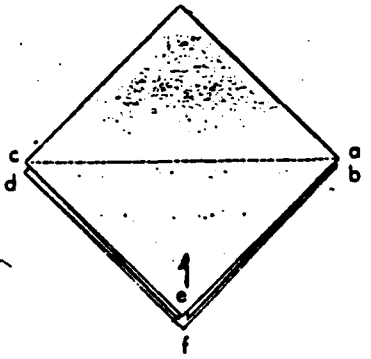


Fold the paper, bringing Points a and b rightwards, and Points c and d leftwards as shown in Step

6, 7, 8

6





Fold the bottom half of the outside leaf up.

Attachment HC-W#1

QUALITY CONTROL STANDARDS

1. NECK AND TAIL ANGLES. The crane's neck and tail must protrude outward at an angle of 45 degrees from the body. Use the plastic triangle to check for the proper angle. A crane with two angles that are exactly 45 degree will be given 20 points--10 points for the neck and 10 points for the tail angle. Any angle that is three degrees greater than or less than the standard 45 degrees will be given between one to nine points based upon your judgment. Any deviation of plus or minus 5 degrees, from the 45 degree standard, will be grounds for rejecting the crane.

2. WING TIPS. The tips of the crane's wings must come to a sharp point and the space on the underside of each wing must be less than $\frac{1}{4}$ inch. A perfect wing will be awarded 10 points each. Thus, two perfect wings will be awarded a total of 20 points.

3. GENERAL OVERALL NEATNESS. Neatness will be awarded a maximum of 10 points. Deduct points for torn or ragged edges.

SCORING

1. Total Possible Points: 50 points.

2. Total up the points you have awarded for the various quality control checkpoints. If a crane earns <u>less than 40 points</u>, <u>reject it</u> and <u>return it</u> to the appropriate supervisor with the reasons for rejection.

3. If a crane earns 40 or more points, it will be accepted and stored in the paper sacks that are provided.

Attachment 2

INSTRUCTIONS(HC)*--WORKER #2'S ROLE

You will be playing the role of a worker in the Special Products Division of the Boilermaker Greeting Card Company. The branch in which you are working specializes in custom-made cards and is presently involved in the production of "origami" paper cranes.

As a production team member, your job is to make a portion of a crane. Instructions are provided in Attachment 1.

A Quality Control Inspector will check all cranes and reject those that do not meet the quality standards (Attachment 2).

For each white "basic form" that you complete successfully, you will be awarded one work credit. For each work credit you will be paid 12 cents. If Worker #1 is unable to provide a sufficient number of white diamond-shaped forms to keep you busy, you may earn blue work credits by working on the reserve pile of blue diamond-shaped forms. However, you will be paid only 6 cents for each blue work credit.

In acting your part, accept the facts and assume the attitude supplied in your specific role. From this point on, let your feelings develop in accordance with the events that transpire in the role playing process. When facts or events arise that are not covered by the role, make up things which are consistent with the way it might be in a real-life situation.

Return this set of instructions to your supervisor at the end of the production session. Your supervisor will tell you when to begin.

*High Cooperation Condition

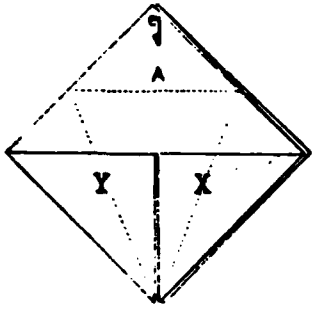
INSTRUCTIONS(HC)*--WORKER #2: CONSTRUCTION TASK

1. Start with the diamond-shaped form. Fold along dotted line "X" then bring the outside edge of the right flap toward the middle. Place a crease along the line created by the fold (see Attachment HC-W#2 for Steps 1 through 10).
2. Fold along dotted line "Y," then bring the outside edge of the left flap toward the middle. Place a crease along the line created by the fold.
3. Turn the diamond-shaped form over.
4. Repeat Step 1.
5. Repeat Step 2.
6. Fold the top portion of the diamond along line "A." Place a crease along the line created by the fold.
7. Unfold the top portion of the diamond.
8. Open the flaps that were folded in Steps 4 and 5.
9. Using the crease along line "A" as a hinge, pull point "e" away from line "A." Use your fingers to ease the outer edges toward the middle as illustrated in the picture.
10. Turn the form over and repeat Step 9.
11. This ends your portion of the construction task. Hand the "basic form" to Worker #3.

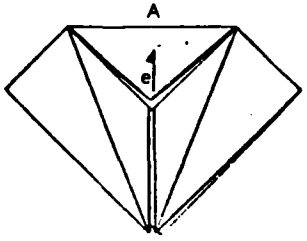
*High Cooperation Condition.

Attachment 1

1, 2--4, 5

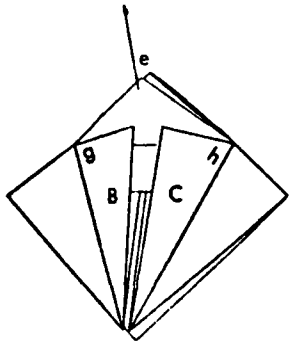


6



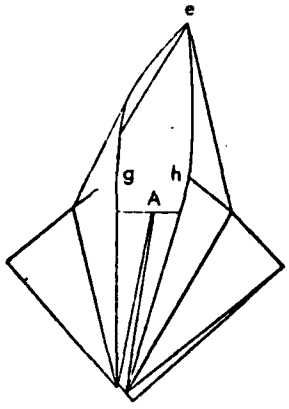
5 & 6 Fold the top leaves, bringing the two edges to the middle. Create along dotted line A and unfold it to make Step 9 easier.

7, 8

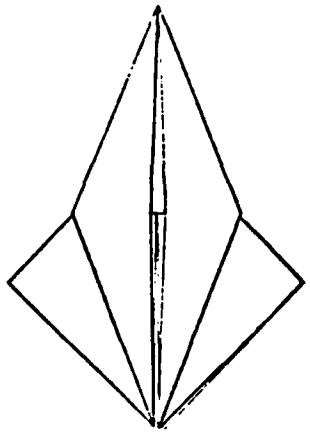


Open the top two flaps B and C, then fold along creased line A, pulling Point e in the direction shown by the arrow and the two edges to the middle as shown.

9

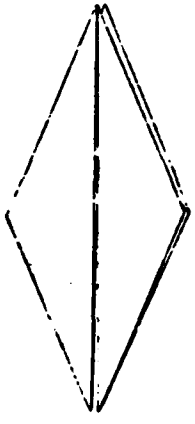


9



Repeat the same process on the reverse side to complete the basic form.

9



Steps **7-9** *are rather difficult, therefore please examine the pictures below.*

Attachment HC-W#2

QUALITY CONTROL STANDARDS

1. NECK AND TAIL ANGLES. The crane's neck and tail must protrude outward at an angle of 45 degrees from the body. Use the plastic triangle to check for the proper angle. A crane with two angles that are exactly 45 degree will be given 20 points--10 points for the neck and 10 points for the tail angle. Any angle that is three degrees greater than or less than the standard 45 degrees will be given between one to nine points based upon your judgment. Any deviation of plus or minus 5 degrees, from the 45 degree standard, will be grounds for rejecting the crane.

2. WING TIPS. The tips of the crane's wings must come to a sharp point and the space on the underside of each wing must be less than $\frac{1}{4}$ inch. A perfect wing will be awarded 10 points each. Thus, two perfect wings will be awarded a total of 20 points.

3. GENERAL OVERALL NEATNESS. Neatness will be awarded a maximum of 10 points. Deduct points for torn or ragged edges.

SCORING

1. Total Possible Points: 50 points.

2. Total up the points you have awarded for the various quality control checkpoints. If a crane earns <u>less than 40 points</u>, <u>reject it</u> and <u>return it</u> to the appropriate supervisor with the reasons for rejection.

3. If a crane earns 40 or more points, it will be accepted and stored in the paper sacks that are provided.

Attachment 2

INSTRUCTIONS(HC)*--WORKER #3'S ROLE

You will be playing the role of a worker in the Special Products Division of the Boilermaker Greeting Card Company. The branch in which you are working specializes in custom-made cards and is presently involved in the production of "origami" paper cranes.

As a production team member, you job is to make a portion of a crane. Instructions are provided in Attachement 1.

A Quality Control Inspector will check all cranes and reject those that do not meet the quality standards (Attachment 2).

For each white "basic form" that you convert into a completed crane, that apases the inspection, you will be awarded one work credit and paid 12 cents. If Worker #2 is unable to provide a sufficient number of white or blue basic forms to keep you busy, you may earn pink work credits by working on the reserve pile of pink basic forms. However, you will be paid only 6 cents for a pink work credit. For each blue form that you convert into a completed crane, you will be awarded one work credit and paid 9 cents.

In acting your part, accept the facts and assume the attitude supplied in your specific role. From this point one, let your feelings develop in accordance with the events that transpire in the role playing process. When facts or events arise that are not covered by the role, make up things which are consistent with the way it might be in a real-life situation.

Return this set of instructions to your supervisor at the end of the production session. Your supervisor will tell you when to begin.

*High Cooperation Condition.

INSTRUCTIONS(HC)*--WORKER #3: CONSTRUCTION TASK

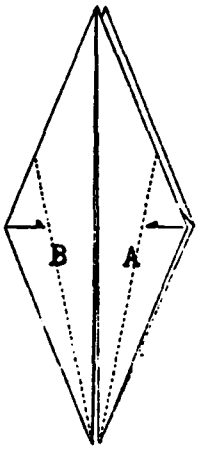
1. Start with the "basic form." Place the form on the work surface so the triangular-shaped flaps are at the bottom.
2. Fold the lower right flap along line "A" and bring the outer edge of the flap toward the middle. Place a crease along the line created by the fold. (see Attachement HC-W#3 for Steps 2 through 11).
3. Fold the lower left flap along line "B" and bring the outer edge of the flap toward the middle. Place a crease along the line created by the fold.
4. Turn the form over.
5. Repeat Step 2.
6. Repeat Step 3.
7. Fold the narrow triangular flap along line "C," bringing the tip of the triangle upward. Place a crease along the line created by the fold.
8. Fold the narrow triangular flap along line "D," bringing the tip of the triangle upward. Place a crease along the line created by the fold.
9. Return the lower right flap to its original position, then fold it upward turning it "outside in" to form the crane's neck. Fold the point down, turning it "outside in" at the same time to make the crane's head. Use the protractor to obtain the 45-degree angles.
10. Return the lower left flap to ots original position, then fold it upward turning it "outside in" to form the crane's tail. Use the protractor to obtain the 45-degree angle.
11. Fold the crane's wings outward and blow air into the hole at the bottom to inflate the crane's body.
12. Place the last names of all team members (printed) who completed some stage of the crane, and the time the crane was completed, on the upper surface of the right wing.
13. Your supervisor will collect all completed cranes.

*High Cooperation Condition.

Attachment 1

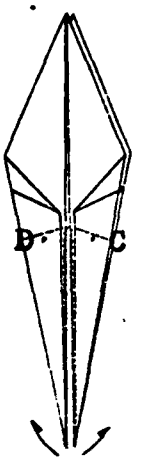
Using the basic form, the crane, Japan's most popular Origami, is easily folded.

1, 2, 3



Fold the paper on the dotted lines on both sides, front and back.

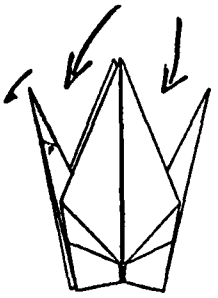
7, 8



Fold the lower ends up, turning them "outside in" at the same time.

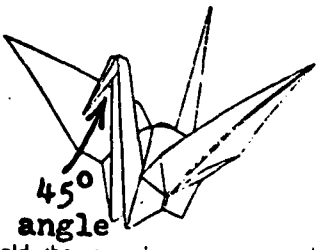
9

45° angles



Fold the left point down, turning it "outside in" at the same time to make the crane's head.

10, 11



Fold the crane's wings outwards and blow air into the hole at the bottom to inflate the crane.

Attachment HC-W#3

QUALITY CONTROL STANDARDS

1. NECK AND TAIL ANGLES. The crane's neck and tail must protrude outward at an angle of 45 degrees from the body. Use the plastic triangle to check for the proper angle. A crane with two angles that are exactly 45 degree will be given 20 points--10 points for the neck and 10 points for the tail angle. Any angle that is three degrees greater than or less than the standard 45 degrees will be given between one to nine points based upon your judgment. Any deviation of plus or minus 5 degrees, from the 45 degree standard, will be grounds for rejecting the crane.

2. WING TIPS. The tips of the crane's wings must come to a sharp point and the space on the underside of each wing must be less than $\frac{1}{4}$ inch. A perfect wing will be awarded 10 points each. Thus, two perfect wings will be awarded a total of 20 points.

3. GENERAL OVERALL NEATNESS. Neatness will be awarded a maximum of 10 points. Deduct points for torn or ragged edges.

SCORING

1. Total Possible Points: 50 points.

2. Total up the points you have awarded for the various quality control checkpoints. If a crane earns <u>less than 40 points</u>, <u>reject it</u> and <u>return it</u> to the appropriate supervisor with the reasons for rejection.

3. If a crane earns 40 or more points, it will be accepted and stored in the paper sacks that are provided.

Attachment 2

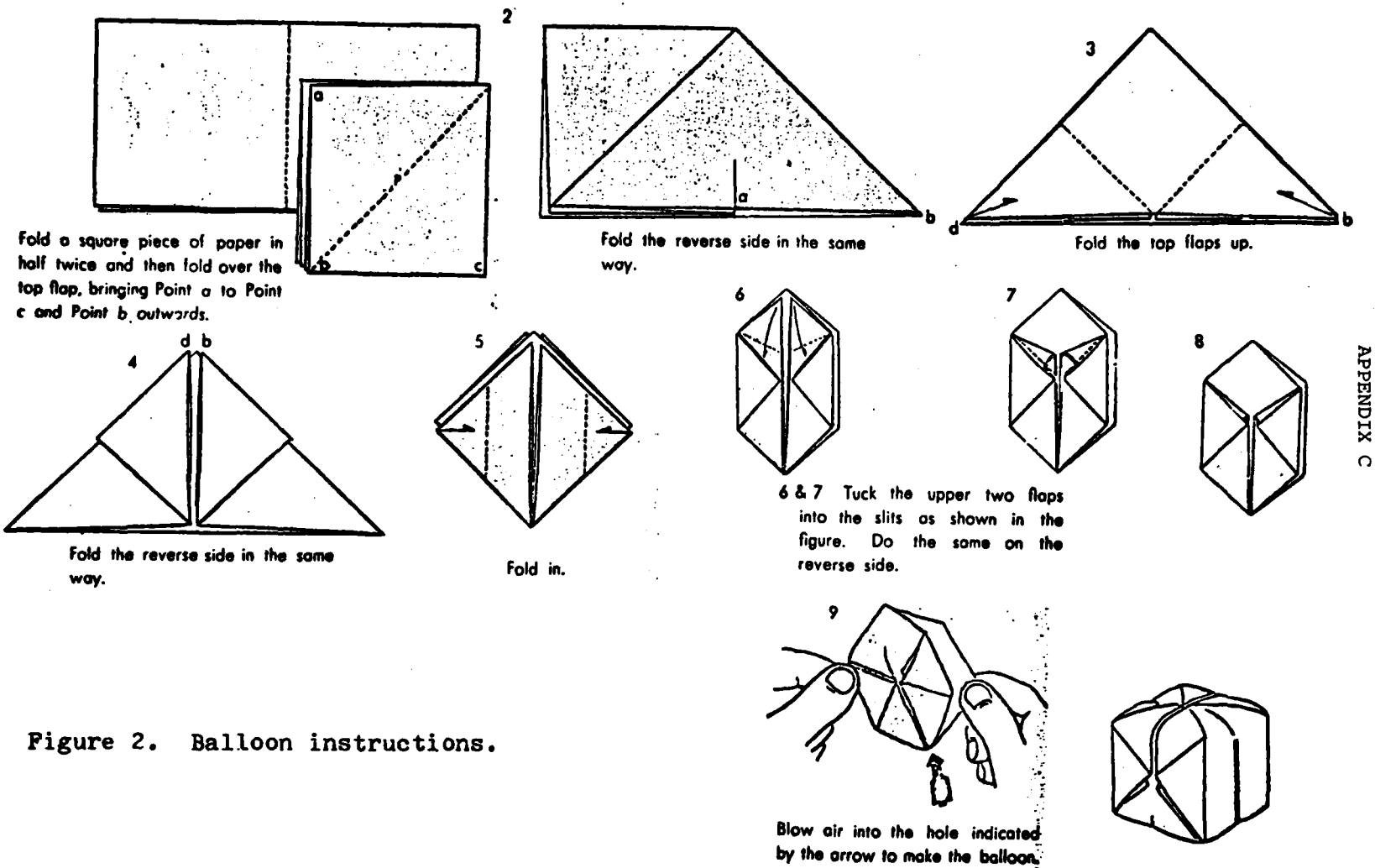


Figure 2. Balloon instructions.

APPENDIX D

Survey of Attitudes (SOA) Scale Items

1. Belief in God
2. Professors and Student Needs
3. Integration in Public Schools
4. Acting on Impulse vs. Careful Consideration of Alternatives
5. Birth Control
6. American Way of Life
7. Premarital Sex Relations
8. Money
9. Grades
10. One True Religion
11. Preparedness for War
12. Welfare Legislation
13. Socialized Medicine
14. War
15. College Education
16. Discipline of Children
17. Nuclear Arms Race
18. Divorce
19. Family Finances
20. Careers for Women

APPENDIX E

GENERAL INSTRUCTIONS--MANAGER'S ROLE

You will be playing the role of the new Branch Manager in the Special Products Division of the Boilermaker Greeting Card Company. Your branch specializes in the production of custom-made cards and is presently involved in the production of "origami" paper cranes.

As Branch Manager you are responsible for a staff comprised of a Supply Clerk and a Quality Control Inspector. In addition, you have two production teams, each comprised of a supervisor and three workers. Your general managerial responsibilities are as follows:

(1) Insure that your branch produces as much as possible;

(2) Resolve any problems or questions that are raised by your supervisors about operating policies and procedures;

(3) Insure that good relations are maintained with the workers;

(4) Provide your supervisors with feedback on their job performance;

(5) Evaluate the performance of each supervisor; and

(6) Supervise your staff.

Your predecessor established the current operational policies and procedures which have proven to be quite effective as his promotion made it possible for you to move into the branch manager's position. Do not change any policies or procedure.

You will be paid a salary which is equivalent to an hourly rate of $3.00 per hour.

A description of the task that your branch is involved with is located in the worker instructions.

A detailed chronological checklist (Attachment 1) is attached. Use it to guide your role playing.

In acting your part, accept the facts and assume the attitude supplied in your specific role. From this point on, let your feelings develop in accordance with the events that transpire in the role playing process. When facts or events arise that are not covered by the role, make up things which are consistent with the way it might be in a real-life situation.

Return this set of instructions to the experimenter at the end of the last production session.

MANAGER'S CHRONOLOGICAL CHECKLIST

Instructions: It is critical that each night's sessions be as similar as possible. Therefore, make every effort to keep to the following schedule.

7:25 p.m.

1. Obtain BGCC Form 7 from the Experimenter.
2. Introduce yourself to your supervisors.
3. Explain your role, responsibilities, and specific duties (Reference: General Instructions--Manager's Role).
4. Remind your supervisors to:
   a. explain their roles, responsibilities, and duties to their workers,
   b. assign workers to specific positions (if the supervisor's group is working under a high cooperation condition),
   c. give the workers their role instructions, and
   d. clarify any procedures the workers do not understand.

7:35 p.m.

1. Remind your supervisors to seat their workers in every other seat--across the first row in the room.
2. Remind your supervisors not to talk to the observers--ignore them.
3. Inform your supervisors that the most productive team, during any one phase, over the duration of the experiment, will be given a $25.00 bonus.
4. Remind your supervisors to obtain a supply of construction paper from the Supply Clerk.
5. Send your supervisors to their assigned rooms to meet and to brief their workers. Remind them that they are to comply with the role instructions and must not start until 7:45 p.m.

7:45 p.m.

Have both groups begin production.

8:45 p.m.

1. Order all groups to stop working--allow workers to complete the current stage they are working on.
2. Have your supervisors record the work credits for partially completed forms. They will complete the pay records after they fill out their questionnaires.
3. Remind your supervisors to return the unused sheets of paper, partially completed forms, and equipment to the Supply Clerk.

8:48 p.m.

1. Collect all Role Instructions. Return them to the Experimenter.
2. Send your supervisors to Room 2 to fill out questionnaires.
3. Send your workers to Room 8 to fill out questionnaires.

Attachment 1

MANAGER'S CHRONOLOGICAL CHECKLIST(Continued)

9:00 p.m.

1. Obtain BGCC Form 3 from your Supply Clerk.
2. Obtain BGCC Form 4 from your Quality Control Inspector.
3. Hold these forms for your supervisors so they may complete their Employee Pay Records.

9:12 p.m.

Have your supervisors meet with their workers so the workers may sign their pay records, and the group may decide on how to dispose of the bonus, should they win it.

9:15 p.m.

1. Give your supervisors their Role Instructions and their workers' role instructions.
2. Remind your supervisors to:
   a. assign workers to specific positions (if the supervisor's group is working under a high cooperation condition),
   b. give the workers their role instructions, and
   c. clarify any procedures the workers do not understand.

9:20 p.m.

1. Remind your supervisors to seat their workers in every other seat--across the first row in the room.
2. Remind your supervisors not to talk to the observers--ignore them.
3. Inform your supervisors that the most productive team, during any one phase, over the duration of the experiment, will be given a $25.00 bonus.
4. Remind each supervisor to obtain a supply of construction paper from the Supply Clerk.
5. Send your supervisors to their assigned rooms to meet and brief their workers. Remind them that they are to comply with the role instructions and must not start until 9:30 p.m.

10:30 p.m.

1. Order all groups to stop working--allow workers to complete the current stage they are working on.
2. Have your supervisors record the work credits for partially completed forms. They will be given the opportunity to complete the pay records after they fill out their questionnaires.
3. Remind your supervisors to return the unused sheets of paper, partially completed forms, and equipment to the Supply Clerk.

10:33 p.m.

1. Collect all Role Instructions. Return them to the Experimenter.
2. Send your supervisors to Room 2 to fill out questionnaires

Attachment 1

and a postexperimental form.
3. Send your workers to Room 8 to fill out questionnaires and a postexperimental form.

10:45 p.m.

1. Obtain BGCC Form 3 from your Supply Clerk.
2. Obtain BGCC Form 4 from your Quality Control Clerk.

10.47 p.m.

1. Have your supervisors interrupt the workers' posttest 2 so the workers may sign their pay records, and the group may decide on how to dispose of the bonus, shoud they win it.

11:00 p.m.

1. Collect all forms from the supervisors.
2. Allow the workers to continue completing their questionnaires.
3. Allow the supervisors to return to their questionnaires.
4. Fill out your questionnaires. Note: You may leave as soon as you are through with the questionnaires and have turned in all forms to the Experimenter.

Attachment 1

INSTRUCTIONS--QUALITY CONTROL INSPECTOR'S ROLE

You will be playing the role of a Quality Control Inspector in the Special Products Division of the Boilermaker Greeting Card Company. The branch you are working in specializes in the production of custom-made cards and is presently involved in the production of "origami" paper cranes.

As Quality Control Inspector you are responsible for inspecting all completed cranes to determine if they meet the company's quality standards (Attachment 2). It is critical that you be as objective as possible, therefore, use the Quality Control Record (BGCC Form 5) (Attachment 1) as you inspect each crane. Maintain a record on each of the work groups.

Store all "quality accepted" cranes in the paper sacks that are provided.

You will be paid $2.50 per hour.

In acting your part, accept the facts and assume that attitude supplied in your specific role. From this point on, let your feelings develop in accordance with the events that transpire in the role playing process. When facts or events arise that are not covered by the role, make up things which are consistent with the way it might be in a real-life situation.

Return this set of instructions and all records to the Manager at the end of the last production session.

Attachment 1

QUALITY CONTROL RECORD

Date _____ Name of Supervisor _____

Production Session ____

	Time	Worker's Last Name	Color	Neck Angle	Tail Angle	Right Wing	Left Wing	Neat-ness	Total Score	ACCEPT 40 +	REJECT < 40
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											

BGCC Form 5

QUALITY CONTROL STANDARDS

1. NECK AND TAIL ANGLES. The crane's neck and tail must protrude outward at an angle of 45 degrees from the body. Use the plastic triangle to check for the proper angle. A crane with two angles that are exactly 45 degree will be given 20 points--10 points for the neck and 10 points for the tail angle. Any angle that is three degrees greater than or less than the standard 45 degrees will be given between one to nine points based upon your judgment. Any deviation of plus or minus 5 degrees, from the 45 degree standard, will be grounds for rejecting the crane.

2. WING TIPS. The tips of the crane's wings must come to a sharp point and the space on the underside of each wing must be less than $\frac{1}{4}$ inch. A perfect wing will be awarded 10 points each. Thus, two perfect wings will be awarded a total of 20 points.

3. GENERAL OVERALL NEATNESS. Neatness will be awarded a maximum of 10 points. Deduct points for torn or ragged edges.

SCORING

1. Total Possible Points: 50 points.

2. Total up the points you have awarded for the various quality control checkpoints. If a crane earns <u>less than 40 points</u>, <u>reject it</u> and <u>return it</u> to the appropriate supervisor with the reasons for rejection.

3. If a crane earns 40 or more points, it will be accepted and stored in the paper sacks that are provided.

Attachment 2

INSTRUCTIONS--SUPPLY CLERK'S ROLE

You will be playing the role of a Supply Clerk in the Special Products Division of the Boilermaker Greeting Card Company. The branch in which you are working specializes in custom-made cards and is presently involved in the production of "origami" paper cranes.

As the Supply Clerk, you are responsible for:

(1) Issuing white construction paper and/or partially completed forms to the supervisors. Due to company policy, you can issue no more than seven sheets of paper and/or three partially completed forms (of each color) to any one supervisor during any one trip that he makes to your room. Use the attached BGCC Form 6 (Attachment 1) to record the amount of paper and the number of forms issued to each group, the number of sheets of paper and/or forms returned by each supervisor at the end of each production session, and attempts made by any supervisor to persuade you to issue more paper and/or forms than you are permitted.

(2) Issuing one pair of scissors, one straight-edge ruler, one letter opener, and one protractor to each group. Have the supervisors return these items at the end of the first production session. Alternate the equipment so each work group receives a different set during the second production session.

You will be paid $2.50 per hour, commencing with the beginning of Production Session 1 and terminating with the end of Production Session 2.

In acting your part, accept the facts and assume that attitude supplied in your specific role. From this point on, let your feelings develop in accordance with the events that transpire in the role making process. When facts or events arise that are not covered by the role, make things up which are consistent with the way it might be in a real-life situation.

Return this set of instructions to the Experimenter at the end of the Second Production Session.

SUPPLY RECORD

Date _____ Name of Supervisor _____

Work Session # _____

	Number Issued		
Time	White Sheets	Blue Forms	Pink Forms
			= Total Number Issued
			= Number Returned
			= Number Utilized

Place your observations on the back of sheet.

BGCC Form 6

Attachment 1

SUPPLY RECORD(Continued)

Please describe any attempts by the supervisors to get you to issue more than seven sheets of paper at any one time.

Name of Supervisor _____

Name of Supervisor _____

Turn this record in to the Branch Manager at the end of the production session.

BGCC Form 6
Attachment 1

APPENDIX F

OBSERVERS' ROTATION SCHEDULE

EVENING	OBSERVERS	WORK GROUP	COOP. COND.
1	1 & 2	1	HC
	3 & 4	2	HC
2	1 & 3	3	LC
	2 & 4	4	LC
3	1 & 4	5	HC
	2 & 3	6	LC
4	3 & 4	7	HC
	1 & 2	8	LC
5	1 & 4	9	HC
	2 & 3	10	HC
6	2 & 4	11	LC
	1 & 3	12	LC
7	1 & 2	13	HC
	3 & 4	14	LC
8	2 & 3	15	HC
	1 & 4	16	LC
9	1 & 2	17	LC
	3 & 4	18	LC
10	1 & 3	19	HC
	2 & 4	20	LC

NAME	NUMBER
DeNisi	1
Gebert	2
Hoyer	3
Krueger	4

APPENDIX G

Participant Consent Form
for
Work Group Performance Study
11/20/74

1. Purpose and Procedure: The study in which you are about to participate, is interested in the behavior of individuals in task oriented groups. Four-person groups, a supervisor and three members, will work as part of a mock company on the task of making paper birds according to specific instructions for folding the paper. The group members will work on the task according to typical work organizations--for example, in sequence such as on an assembly line. Both before and after working on the task, paper and pencil tests will be administered to measure such things as interests, abilities, values, and reactions to the task and group. In addition, a sample test on the paper folding task will be administered before the group meets. Finally, observers will be present during the group sessions.

The mock company will have a manager, supply clerk, and quality control inspector in addition to the supervisor and workers. All participants in the study will be assigned to one of these positions. The study involves no deception.

2. Time and pay: The whole experiment will take approximately three and one-half hours. During this time, two hours will involve working on the task and one hour will involve taking many tests. All participants will be paid at least $2.00 an hour when taking tests. In addition, workers will be paid on a piece-rate when working on the paper folding tasks for the piece-rate was set so that over all the participants average pay will be $2.00/hour. Finally, a bonus of $25.00 will be paid to the work group that performs best.

3. Freedom to terminate participation: As a participant in the study we encourage you to complete the whole 3½-hour session. We can only use the data from those who complete it. However, if at any time you do not desire to continue, you may quit and you will be paid for your participation up to that point.

4. Confidentiality of data: No one other than the research staff will see your individual data. All reports will be presented in summary form making it impossible to identify specific individual's responses.

5. Debriefing: Following the completion of the study the specific areas of the study will be explicitly described and any questions will be answered. Of course, any questions you may have about the procedures involved in the study will be directly addressed by the staff during the study.

Purdue University
Committee on Use of Human Subjects
HS-7 (5-1-72)

INFORMED SUBJECT CONSENT

As indicated by my signature below and being of sound mind, I do hereby voluntarily consent to serve as a subject in the proposed procedure identified and explained in the document dated November 20, 1974 and entitled "Work Group Performance Study" which document is attached to and hereby made a part of this consent.

	Subject Name	Age	Subject Signature	Date
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

APPENDIX H

WORKER RATING REPORT

Worker's Name _____ (Last) **Group** _____

Supervisor's Name _____ (Last) **Session** _____

DIRECTIONS:

1) Rate all workers on one factor before going on to the next factor.
2) Consider only performance on the present job.
3) Place an "X" before the one description that best describes this worker's performance.

1. Quality of Work (accuracy, neatness, etc.)
   - ___ Consistently superior.
   - ___ Sometimes superior.
   - ___ Consistently satisfactory.
   - ___ Usually acceptable.
   - ___ Consistently unsatisfactory.

2. Quanity of Work
   - ___ Consistently above standard.
   - ___ Often above standard.
   - ___ Meets standard.
   - ___ Sometimes below standard.
   - ___ Consistently below standard.

3. Attitude (toward job, other employees, supervisor)
   - ___ Inspires others to work as a team.
   - ___ Quick to volunteer or help others.
   - ___ Cooperative as a general rule.
   - ___ Works well with some and not others.
   - ___ Works poorly with others.

4. Promotion Potential (to supervisor's position)
   - ___ Outstanding growth potential based on demonstrated performance.
   - ___ Demonstrates capability for increased responsibility. Consider for advancement ahead of contemporaries.
   - ___ Performaing well in present position. Should be considered for advancement along with contemporaries.
   - ___ Does not demonstrate a capability for promotion at this time.
   - ___ Does not possess any supervisory potential at all.

Comments: (optional)

APPENDIX I

EMPLOYEE PAY RECORD

Date _____ **Supervisor** _____

Session _____ **Worker** _____
(Last Name)

INSTRUCTIONS:

(1) Supervisor: Determine the number of work credits earned by this worker and compute his pay for this production session. After the form is signed by the worker, turn it in to the Branch Manager.

(2) Employee: Check the number of work credits awarded to you as well as your pay. If you agree with your supervisor's calculations, sign in the space below. If you don't agree with his figures, discuss the matter with him. Don't sign the form unless you are satisfied.

(3) If a disagreement cannot be resolved by the supervisor and the employee, the matter will be referred to the Branch Manager.

1. Number of completed white cranes credited to employee	
2. Multiply Line 1 by three	
3. Number of unfinished white crane work units (credits)	
4. Total of Lines 2 & 3	
5. Multiply Line 4 by .12 = Pay for Work Session	$

(Supervisor's Signature) (Employee's Signature)

PROCEDURE FOR DETERMINING WORK CREDITS:

Completed Cranes: Three work credits for each white crane accepted by the Quality Control Inspector.

Unfinished Crane: One work credit for crane completed through the diamond-shaped form stage(Step 9); and two work credits for crane completed through the basic form stage(Step 19).

*Obtain a "running" tally from the Quality Control Inspector during each trip to his office. Do not wait until the end of the work session to obtain this information.

BGCC Form 1

EMPLOYEE PAY RECORD

Date _____ **Supervisor** _____

Session _____ **Worker #1** _____
(Last Name)

INSTRUCTIONS:

(1) Supervisor: Determine the number of work credits earned by this worker and compute his pay for this production session. After the form is signed by the worker, turn it in to the Branch Manager.

(2) Employee: Check the number of work credits awarded to you as well as your pay. If you agree with your supervisor's calculations, sign in the space below. If you don't agree with his figures, discuss the matter with him. Don't sign the form unless you are satisfied.

(3) If a disagreement cannot be resolved by the supervisor and the employee, the matter will be referred to the Branch Manager.

1. Number of completed white crane work credits	
2. Number of white diamond-shaped form work credits	
3. Total of Lines 1 & 2	
4. Multiply Line 3 by .12 = Pay for Work Session	$

_____ _____
(Supervisor's Signature) (Employee's Signature)

PROCEDURE FOR DETERMINING WORK CREDITS:

Complete Cranes: One work credit for each white crane accepted by the Quality Control Inspector.*

Unfinished Forms: One work credit for each white diamond-shaped form at Worker #2's station at the end of the production session.

*Obtain a "running tally" from the Quality Control Inspector during each trip to his office. Do not wait until the end of the production session to obtain this information.

BGCC Form 2

EMPLOYEE PAY RECORD

Date _____ **Supervisor** _____

Session _____ **Worker #2** _____
(Last Name)

INSTRUCTIONS:

(1) Supervisor: Determine the number of work credits earned by this worker and compute his pay for this production session. After the form is signed by the worker, turn it in to the Branch Manager.

(2) Employee: Check the number of work credits awarded to you as well as your pay. If you agree with your supervisor's calculations, sign in the space below. If you don't agree with his figures, discuss the matter with him. Don't sign the form unless you are satisfied.

(3) If a disagreement cannot be resolved by the supervisor and the employee, the matter will be referred to the Branch Manager.

1. Number of white crane work credits	
2. Number of white basic form work credits	
3. Number of blue basic form work credits	
4. Multiply Line 1 by .12	
5. Multiply Line 2 by .12	
6. Multiply Line 3 by .06	
7. Total of Lines 4, 5 & 6 = Pay for Work Session	$

(Supervisor's Signature) (Employee's Signature)

BGCC Form 3(Continued)

PROCEDURE FOR DETERMINING WORK CREDITS:

Completed Cranes: One work credit for each white crane accepted by the Quality Control Inspector.*

Unfinished Forms: One work credit for each white and/or blue basic form at Worker #3's station at the end of the production session.

*Obtain a "running tally" from the Quality Control Inspector during each trip to his office. Do not wait until the end of the production session to obtain this information.

BGCC Form 3

EMPLOYEE PAY RECORD

Date _____ Supervisor _____

Session ____ Worker #3 _____
(Last Name)

INSTRUCTIONS:

(1) Supervisor: Determine the number of work credits earned by this worker and compute his pay for this production session. After the form is signed by the worker, turn it in to the Branch Manager.

(2) Employee: Check the number of work credits awarded to you as well as your pay. If you agree with your supervisor's calculations, sign in the space below. If you don't agree with his figures, discuss the matter with him. Don't sign the form unless you are satisfied.

(3) If a disagreement cannot be resolved by the supervisor and the employee, the matter will be referred to the Branch Manager.

1. Number of white crane work credits	
2. Number of blue crane work credits	
3. Number of pink crane work credits	
4. Multiply Line 1 by .12	
5. Multiply Line 2 by .09	
6. Multiply Line 3 by .06	
7. Total of Lines 4, 5 & 6 = Pay for Work Session	$

(Supervisor's Signature) (Employee's Signature)

BGCC Form 4(Continued)

PROCEDURE FOR DETERMINING WORK CREDITS: One work credit for each white, blue or pink crane accepted by the Quality Control Inspector.*

*Obtain a "running tally" from the Quality Control Inspector during each trip to his office. Do not wait until the end of the production session to obtain this information.

BGCC Form 4

APPENDIX J

BEHAVIOR CHECKLIST

Name of Rater _____ (Last) Session _____

Name of Person Being Rated _____ (Last) Date _____

INSTRUCTIONS: Indicate the extent to which the person being rated showed the following behaviors. Use the following scoring system:

4 points (4) = "a great deal"
3 points (3) = "fairly much"
2 points (2) = "to some degree"
1 point (1) = "comparatively little"
0 points (0) = "not at all"

	OBSERVED BEHAVIOR	Score
1.	Engaged in friendly jokes and comments	___
2.	Made others feel at ease	___
3.	Complimented others	___
4.	Helped others	___
5.	Encouraged others to express their ideas and opinions	___
6.	Had others share in making decisions with him	___
7.	Helped settle conflicts	___
8.	Showed initiative	___
9.	Was effective in saying what he wanted to say	___
10.	Clearly defined or outlined problems	___
11.	Motivated others to participate	___
12.	Influenced others	___
13.	Offered good solutions to problems	___
14.	Led discussions	___

APPENDIX K

LEADER BEHAVIOR CODING SHEET

Supv → Wkr$_1$ ← Wkr$_2$ Wkr$_3$		Supv → Wkr$_2$ Wkr$_1$ Wkr$_3$		Supv → Wkr$_3$ Wkr$_1$ Wkr$_2$	
C	IS	C	IS	C	IS
1 ___	1 ___	1 ___	1 ___	1 ___	1 ___
2 ___	2 ___	2 ___	2 ___	2 ___	2 ___
3 ___	3 ___	3 ___	3 ___	3 ___	3 ___
4 ___	4 ___	4 ___	4 ___	4 ___	4 ___
5 ___	5 ___	5 ___	5 ___	5 ___	5 ___
6 ___	6 ___	6 ___	6 ___	6 ___	6 ___
7 ___	7 ___	7 ___	7 ___	7 ___	7 ___

Supv → Wkr$_1$ ← Wkr$_2$ Wkr$_3$		Supv → Wkr$_2$ ← Wkr$_3$ Wkr$_1$		Supv → Wkr$_1$ ← Wkr$_3$ Wkr$_2$	
C	IS	C	IS	C	IS
1 ___	1 ___	1 ___	1 ___	1 ___	1 ___
2 ___	2 ___	2 ___	2 ___	2 ___	2 ___
3 ___	3 ___	3 ___	3 ___	3 ___	3 ___
4 ___	4 ___	4 ___	4 ___	4 ___	4 ___
5 ___	5 ___	5 ___	5 ___	5 ___	5 ___
6 ___	6 ___	6 ___	6 ___	6 ___	6 ___
7 ___	7 ___	7 ___	7 ___	7 ___	7 ___

C

1. Engages in friendly jokes & comments
2. Makes other(s) feel at ease
3. Compliments others
4. Helps other(s)
5. Encourages other(s to express ideas & opinions
6. Has other(s) share in making decision with him
7. Helps settle conflict

Supv → Wkr$_1$ Wkr$_2$ Wkr$_3$

C	IS
1 ___	1 ___
2 ___	2 ___
3 ___	3 ___
4 ___	4 ___
5 ___	5 ___
6 ___	6 ___
7 ___	7 ___

IS

1. Shows initiative
2. Effective in saying what he wants to say
3. Clearly defines or outlines problem
4. Motivates other(s) to participate
5. Influences worker(s)
6. Offers good solution to the problem
7. Leads the discussion

APPENDIX L

POSTEXPERIMENTAL QUESTIONNAIRE

Name _____ (Last) Date _____ Major _____

Role _____ Age ____

1. In your opinion, what was the experimenter interested in finding out? That is, what was his purpose for conducting the study?

2. Were your role playing instructions adequate? Did it give you a clear idea of what you were supposed to do? If not, describe what was difficult to understand.

3. Before tonight, did you know any of the other persons in your work group? If so, please describe your relationship, e.g., close friend, casual acquaintance, etc.

4. Did you hear about this study before you took part in it? If so, did it affect your role playing?

5. To what extent did you feel your pay was related to your performance?

Production Session 1	Production Session 2
___ Not at all	___ Not at all
___ Slightly	___ Slightly
___ Somewhat	___ Somewhat
___ Quite	___ Quite
___ Very	___ Very

INSTRUCTIONS: Select the one adjective that best describes your feelings in Production Sessions 1 and 2. Write your choice on the lines.

	Session 1	Session 2
6. Did you enjoy being a member of the work group?	____	____
7. Did the other group members seem to like and accept you?	____	____
8. Are you satisfied with your contribution to the overall group performance?	____	____
9. Were you irritated with one or more members of your group?	____	____

POSTEXPERIMENTAL QUESTIONNAIRE(Continued)

	Session 1	Session 2
10. In comparison to other workers in your group, to what extent did the supervisor depend upon you?.	____	____

A=Very much B=Quite a bit C=Somewhat D=A little E=Not at all

---

11. Did you find the task interesting?	____	____
12. Was it important to you that your group be among the best?	____	____

A=Definitely B=Quite C=Somewhat D=A little E=Definitely not

---

13. Did you have difficulty communicating your ideas to the other members of the group?	____	____

A=Much difficulty B=Quite a bit C=Some D=A little E=None at all

---

14. How well do you think your group performed in comparison with other groups?	____	____
15. How well do you think your group would do on future tasks?	____	____

A=Better than most B=Better than some C=About average
D=Less than some E=Worse than most

---

16. How well did your supervisor do his job?	____	____
17. How well did you get along with your supervisor, in terms of your personalities?	____	____

A=Very well B=Better than average C=About average
D=Below average E=Not at all

APPENDIX M

DEBRIEFING INFORMATION

You have just taken part in a study where we were trying to determine the influence of personality and situational factors (compatibility between a leader and a follower in terms of dominance, and degree of interworker cooperation) upon certain group processes and group-related outcomes (interpersonal attraction, job satisfaction, and worker productivity). Previous studies have found that compatibility between a leader and a follower, in terms of personality traits, can influence group performance. Also, there is some evidence that situational variables can influence group outcomes. The present study was designed to control these variables and to evaluate how they impact upon the leader's behavior toward each of his followers, as well as how the followers respond to such a leader. You were assigned the role of a supervisor or worker according to your dominance score. There were no absolute rules for making the role assignments. Among the several persons who scored high, moderate or low on dominance, the appropriate number of "actors" required for the experimental design were selected at random. The subjective instruments that you completed after the production sessions are intended to provide dependent variable measures such as degree of interpersonal attraction and type of manifested leader behavior.

Because we have to use many additional groups with the same design and because it is desirable to have subjects act in a normal manner, we ask you not to discuss this experiment with anyone until the end of the semester. If you have any questions or would like to receive a summary of the findings, contact Don Fujii (447-7804). Thank you for your assistance.

References:

Smelser, W. T. Dominance as a factor in achievement and perception in cooperative problem solving interactions. Journal of Abnormal Social Psychology, 1961, 62, 535-542.

Tannenbaum, R., & Schmidt, W. H. How to choose a leadership pattern. Harvard Business Review, 1958, 36, 95-101.

APPENDIX N

DATA COLLECTION SCHEDULE

EVEN-ING	SESSION 1			SESSION 2		
	LDR DOM	WKR GRP	COOP COND	LDR DOM	WKR GRP	COOP COND
1	HD_1	1	HC_1	HD_1	2	HC_2
	LD_1	2	HC_2	LD_1	1	HC_1
2	HD_2	3	LC_1	HD_2	4	LC_2
	LD_2	4	LC_2	LD_2	3	LC_1
3	LD_3	5	HC_3	LD_3	6	LC_3
	HD_3	6	LC_3	HD_3	5	HC_3
4	HD_4	7	HC_4	HD_4	8	LC_4
	LD_4	8	LC_4	LD_4	7	HC_4
5	HD_5	9	HC_5	HD_5	10	HC_6
	LD_5	10	HC_6	LD_5	9	HC_5

DATA COLLECTION SCHEDULE(Continued)

EVEN-ING	SESSION 1			SESSION 2		
	LDR DOM	WKR GRP	COOP COND	LDR DOM	WKR GRP	COOP COND
6	HD_6	11	LC_5	HD_6	12	LC_6
	LD_6	12	LC_6	LD_6	11	LC_5
7	LD_7	13	HC_7	LD_7	14	LC_7
	HD_7	14	LC_7	HD_7	13	HC_7
8	HD_8	15	HC_8	HD_8	16	LC_8
	LD_8	16	LC_8	LD_8	15	HC_8
9	HD_9	17	LC_9	HD_9	18	LC_{10}
	LD_9	18	LC_{10}	LD_9	17	LC_9
10	HD_{10}	19	HC_9	HD_{10}	20	LC_{11}
	LD_{10}	20	LC_{11}	LD_{10}	19	HC_9

APPENDIX O

Table 1A

Compatibility(Dominance) and Leader-to-Follower Attraction: Descriptive Statistics and ANOV Summary Table

Descriptive Statistics

Treatment Group	1	2	3	4	5
Sample Size	15	15	30	15	15
Mean	11.40	9.07	11.40	10.20	9.60
Standard Deviation	1.84	2.87	1.43	2.73	2.47

ANOV Summary Table

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	80.76	4	20.19	4.17 **
Within Groups	411.73	85	4.84	
Total	492.49	89		

**$p < .01$.

APPENDIX P

Table 2A

Compatibility (Dominance) and Follower-to-Leader Attraction: Descriptive Statistics and ANOV Summary Table

Descriptive Statistics

Treatment Group	1	2	3	4	5
Sample Size	15	15	30	15	15
Mean	8.93	10.73	10.43	10.73	10.47
Standard Deviation	2.71	2.15	2.69	2.02	1.92

ANOV Summary Table

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	34.59	4	8.65	1.51
Within Groups	485.90	85	5.72	
Total	520.49	89		

APPENDIX Q

Table 3A

Compatibility(Dominance) and Similarity of Attitudes: Descriptive Statistics and ANOV Summary Table

Descriptive Statistics

Treatment Group	1	2	3	4	5
Sample Size	15	15	30	15	15
Mean	60.67	61.33	63.83	65.00	57.00
Standard Deviation	7.76	14.20	13.11	12.54	7.97

ANOV Summary Table

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	643.89	4	160.97	1.17
Within Groups	11,740.83	85	138.13	
Total	12,384.72	89		

APPENDIX R

Table 4A

Compatibility(Interpersonal Attraction) and Similarity of Attitudes: Descriptive Statistics and ANOV Summary Table

Descriptive Statistics

Treatment Group	1	2	3
Sample Size	23	46	21
Mean	56.96	61.09	69.29
Standard Deviation	13.12	10.85	8.84

ANOV Summary Table

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	1,737.83	2	868.91	7.10**
Within Groups	10,646.89	87	122.38	
Total	12,384.72	89		

**$p < .01$.

APPENDIX S

Table 5A

Compatibility(Interpersonal Attraction) and Consideration: Descriptive Statistics and ANOV Summary Table

Descriptive Statistics

Treatment Group	1	2	3
Sample Size	23	46	21
Mean	29.30	33.07	36.10
Standard Deviation	4.58	6.23	4.06

ANOV Summary Table

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	512.31	2	256.15	8.78**
Within Groups	2,539.48	87	29.19	
Total	3,051.79	89		

**$p < .01$.

APPENDIX T

Table 6A

Compatibility(Interpersonal Attraction) and Tolerance of Freedom: Descriptive Statistics and ANOV Summary Table

Descriptive Statistics

Treatment Group	1	2	3
Sample Size	23	46	21
Mean	33.35	38.76	39.48
Standard Deviation	5.08	4.90	5.86

ANOV Summary Table

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	551.50	2	275.75	10.27***
Within Groups	2,336.83	87	26.86	
Total	2,888.32	89		

***$p < .001$.

.APPENDIX U

Table 7A

Compatibility(Interpersonal Attraction) and Initiation of Structure: Descriptive Statistics and ANOV Summary Table

Descriptive Statistics

Treatment Group	1	2	3
Sample Size	23	46	21
Mean	31.70	32.65	36.19

ANOV Summary Table

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	253.56	2	126.78	3.56*
Within Groups	3,100.54	87	35.64	
Total	3,354.10	89		

*$p < .05$.

APPENDIX V

Table 8A

Compatibility(Interpersonal Attraction) and Role Assumption: Descriptive Statistics and ANOV Summary Table

Descriptive Statistics

Treatment Group	1	2	3
Sample Size	23	46	21
Mean	33.57	35.91	38.33
Standard Deviation	5.39	6.42	4.82

ANOV Summary Table

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	249.68	2	124.84	3.67*
Within Groups	2,959.97	87	34.02	
Total	3,209.66	89		

*$p < .05$.

APPENDIX W

Table 9A

Compatibility(Interpersonal Attraction) and Production Emphasis: Descriptive Statistics and ANOV Summary Table

Descriptive Statistics

Treatment Group	1	2	3
Sample Size	23	46	21
Mean	32.17	31.85	33.76
Standard Deviation	6.96	8.42	7.40

ANOV Summary Table

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	54.11	2	27.05	.44
Within Groups	5,349.05	87	61.48	
Total	5,403.16	89		

APPENDIX X

Table 10A

Interrater Reliabilities(LBCS)

	FOLLOWER									
	1		2		3		ALL		TOTAL	
OBS	C	IS	C	IS	C	IS	C	IS	C	IS
1 & 2	.80	.98	.81	.90	.94	.97	.87	.74	.86	.98
1 & 3	.50	.98	.49	.89	.95	1.00	.99	.97	.96	1.00
1 & 4	.89	.92	.98	.93	.81	.82	.98	.96	.99	.94
2 & 4	.54	1.00	.88	.99	.90	.96	.53	.73	-.33	.99
3 & 4	.96	.98	.81	.93	.83	.87	.92	.77	.98	.96
$\bar{r}$ =	.83	.97	.85	.95	.90	.93	.90	.87	.92	.97

Combined Interrater Reliabilities on Followers 1, 2 and 3

	C	IS
	.83	.97
	.85	.95
	.90	.93
$\bar{r}$ =	.86	.91

APPENDIX Y

Table 11A

Interrater Reliabilities(LBDQ)

OBS	C	TF	IS	PE	RA
1 & 2	.50	.59	.38	.55	-.10
1 & 3	.84	.68	.91	.81	.94
1 & 4	.96	.66	.93	.88	.85
2 & 3	.54	-.05	.71	.89	.62
2 & 4	-.06	.78	-.04	-.03	.17
3 & 4	.58	.55	.77	.82	.95
$\bar{r}$ =	.67	.57	.72	.73	.73

APPENDIX Z

Table 12A

Interrater Reliabilities(BC)

OBS	C	IS
1 & 2	.48	.04
1 & 3	.75	.62
1 & 4	.96	.78
2 & 3	.96	.81
2 & 4	.79	.69
3 & 4	.68	.93
$\bar{r}$ =	.83	.72

APPENDIX AA

Table 13A
Cut-off points for intrinsic, extrinsic, and general satisfaction scores

First Production Session

	Percentile Points	
	33rd	67th
Intrinsic Satisfaction	33.10	41.25
Extrinsic Satisfaction	17.00	20.50
General Satisfaction	58.83	67.17

Second Production Session

	Percentile Points	
	33rd	67th
Intrinsic Satisfaction	35.00	42.70
Extrinsic Satisfaction	17.33	20.50
General Satisfaction	59.30	68.83