

UNANIMOUS GROUP SOLUTIONS: NORMATIVE
SOLUTIONS AND SEX DIFFERENCES OF
EMERGENT GROUP LEADERS

By

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Chapter 1

Introduction

Background

Work groups, whether they be executive committees, task-forces, project teams, quality circles, or named by whatever label best describes their immediate function are used widely throughout organizational settings. The dynamics of these groups is an area of interest for persons who both form and rely upon the recommendations of these groups. A great deal of research has been published in the general area of group processes.

Groups have been studied as social units at both their own level and at the level of analysis of the individual members since the 1920's (Hare, 1962). Social influence was recognized as having an effect on individual behavior as early as 1897 when Triplett investigated the effects of competition on individual performance. Bicycle racers turned in their fastest times when directly competing with other racers. Triplett labeled this phenomenon "dynamogenic theory", and tested his hypothesis with fishing reel devices which could be operated by either one person alone, or two individuals simultaneously. "Triplett found that the together (competition) situation produced much faster rates, and thus concluded that this dynamogenic theory was verified" (Shaw, 1971, p. 55).

This early work of Triplett falls into one area of early research. His concern was with a number of individuals working on the same task, but with each person working as an individual. Later studies led to research during the 1920's on the effects of both passive and coaxing (usually loud encouragement, but from a distance) audiences upon the performance of individuals. The areas of interest in those studies were judgment, problem solving and learning (Allport, 1965; Asch, 1956). This early research focus upon audience reaction and upon personality traits of leaders was the result of that research having been conducted primarily by psychologists. "Social psychologists had hardly discovered their identity, and sociologists, for their part, were not yet collecting empirical data on groups" (Zander, 1979(a), p. 273).

Specific reference to leadership within groups was made by Dashiell (1937) when he wrote ". . . the individual person often shows, wittingly or unwittingly, deference to the attitudes and opinions of (both) a majority and to those of persons enjoying prestige . . ." (p. 495). This recognition of leader influence applied to both the legitimate exercise of public authority and to subtle interpersonal relations. It was during this period that collective behavior was recognized as being an area which could be examined by use of scientific methods. Moreno proposed the use of sociometrics to identify group structure and attractiveness in 1934. Sherif began an investigation

of the influence of group norms on group members' behavior in 1936, and important early research on groups was begun when the National Research Council was employed by Western Electric during the period of 1924-1931 to research methods by which employee productivity could be improved. The literature indicates that the Western Electric ("Hawthorne") studies were the beginning recognition of the importance of social influence in the workplace, i.e. when Roethlisberger and Dickson reported the influence of informal work groups on production norms at the Hawthorne Western Electric plant (1939).

In 1942 Kurt Lewin predicted that:

Although the scientific investigations of group work are but a few years old, I don't hesitate to predict that group work - that is, the handling of human beings not as isolated individuals, but in the social setting of groups - will soon be one of the most important theoretical and practical fields. . . . There is no hope for creating a better world without a deeper scientific insight into the function of leadership and culture, and of other essentials of group life. (Zander, 1979(b), p. 418)

A consistent problem throughout early research on groups is that the term "group" was used to describe any number of kinds of collections of people. The term was

applied to what was most frequently no more than a collection of people brought together for the purpose of a particular study (Sherif & Sherif, 1969). But as stated by Mills (1979), "Instant interaction does not equal group development" (p. 419). Hoffman (1979a) also observed that "the most striking neglect in experimental research is (still) the contrived nature of groups. Because experimenters bring a number of people together, call them a group, and ask them to solve a problem, they interpret the results as if the group as a whole solved the problem" (1967, p. 386). If group dynamics is to be a legitimate area of study, then adequate time is necessary for interdependence and interaction between its members to produce real group structure and norms.

With these considerations in mind, use of the term "work group" in this study will conform with the following definition:

Definitions

Groups

A group is a social unit consisting of a number of individuals who stand in role and status relationships to one another, stabilized in some degree at the time, and who possess a set of values or norms of their own regulating their behavior, at least in matters of consequence to the group. (Sherif & Sherif, 1969, p. 131)

The above definition allows for recognition of the time element for norm development, and for status (i.e. for leadership) to develop within the group. It is also adequate to describe formal or informal, and large or small groups. Real groups for this study were upper-level undergraduate students who were assigned to task-related work groups as part of their course work. No formal structure was imposed upon the groups. Members of each real group interacted on a number of discretionary superordinate tasks for a period of 11 weeks.

Role Relations

Role relations as contained in the above definition refer to characteristic reciprocal and expected behaviors of individual members during group interaction (Borgatta & Bales, 1953; Goffman, 1959; Sherif & Sherif, 1969; Shaw, 1971; Hare, 1976; Vander Zanden, 1977). Roles define the behavior that group members are expected to perform (expected behavior). And role behaviors are also linked together, where a certain event or behavior within the group obliges certain other members to behave in a particular way (reciprocal behavior).

While studying the dynamics of new group formation, Borgatta and Bales (1953) observed the emerging leaders to be highly active in their initiation of both suggestions and opinions during the first "new group" session. The roles assumed by these new emerging leaders then developed to become those of engaging in a power and status struggle in

their second "group" session, and then to finally become less active after his/her position was established and less effort was required to maintain acceptance of their opinions and suggestions.

Status (power)

Status within a group identifies a member's place in the hierarchy (i.e. formal or informal structure) of a group, and is usually thought of as the power or authority dimension of a group (MacNeil, 1967; Sherif & Sherif, 1969; Stogdill, 1974; Vander Zanden, 1977). Power refers to the individual's exercise of "effective initiative" (see page 8) over time, and is exercised during group activities, decision making, and interaction with group members (Sherif & Sherif, 1969). Vander Zanden also points out that power is relative; one cannot have social power all by oneself. Stogdill (1974) defines power as "an influence or exchange relation" (p. 276), and goes on to say that ". . . the person employing power tries to 'maximize expected utility'" (p. 285).

The issue here is not whether power is legitimate or illegitimate. Power in the sense of this discussion is relative to the "unofficial" organization of status and role relationships as they become stabilized within informal groups. Although the groups of interest here are task-oriented groups, authority versus power should not become an issue of "legitimate" authority as it contrasts with "illegitimate" power within formalized structures such as a

bureaucratized, Weberian organization (Gerth & Mills, 1958). The term power shall be used simply to imply a relative level of ability to successfully influence the other group members. Relative power in this sense is one dimension of a member's relative status within the group, and if its basis is a formally unstructured group, that influence will be all the more salient.

Norms

Norms may be considered to be standardized generalizations that are usually thought of in terms of values and behavior. In the most general sense, norms apply to classes of objects to include people, events and behavior, and are evaluative in nature. Norms are rules, both written and unwritten, both explicit and implicit. Within groups, norms may apply to individual group members to varying and differing degrees (Hare, 1976; MacNeil, 1967; Shaw, 1971; Sherif & Sherif, 1969; Stogdill, 1974). And in addition to norms specific to the group which are formed as a result of group interaction over time, each prospective group member also brings with them their own social and personal norms which are based on their own past experiences.

Organization (structure)

Organization shall be defined as ". . . an interdependent network of roles and hierarchial statuses defining the reciprocal expectations, responsibilities, and power arrangements of the membership in a normatively

oriented social unit (small or large)" (Sherif & Sherif, 1969, p. 150). This definition will be adequate for both the individuals within the group (or organization), and for the group itself as a member (or social unit) within a larger organization or society.

Effective Initiative

Effective initiative refers to the initiation of ideas or decisions which are subsequently followed by the group (Bales, 1960; Sherif & Sherif, 1969; Stogdill, 1974).

Natural Formation of Group Structure

Groups occur naturally throughout human culture. Faris (1953), Sayles and Strauss (1966), and Sherif and Sherif (1969) conclude that the literature shows groups to be the natural habitat of human beings.

Groups may also be described both in terms of their own structure or as their being distinct social units within a larger system, organization or society (Asch, 1956; MacNeil & Sherif, 1976; Miller, 1971; Sherif & Sherif, 1969). But although groups may occur either naturally or be deliberately formed, and whether they be task or socially oriented, certain elements must be present before "real" group structure may occur.

According to Sherif and Sherif (1969), natural group formation requires that four elements be present before a collection of people may be considered to be a group:

1. a shared motivational base,
2. organizational (or "group") structure of roles and

- statuses which differentiate between members and from non-members,
3. group-produced differential effects on the attitudes and behaviors of individual members, and
 4. a set of norms.

An example of the above would be Sheriff's 1954 Robber's Cave studies. The Robber's Cave studies demonstrated how, after about a week in a situation requiring interdependent activity by a collection of people (boys), and without having had a status hierarchy imposed upon them by a "higher authority",

one boy in each group began to rank highest in the exercise of effective initiative across situations, frequently with the close assistance of one or two others of high rank. Some boys were sifted toward the bottom of the emerging structure while others jockeyed for higher positions of respect and influence. (Sherif & Sherif, 1969, p. 233)

The emergent group leaders were identified by observing which individuals exercised "effective initiative" in both task and decision-making situations, both within their own groups and in inter-group relations. When the observer was satisfied that his observations were accurate and that the group structure was stable, an independent rater watched the groups. Finally, informal sociometric choices were obtained directly from the boys. "The rank-order correlations among

these (three) measures were significantly high in every case" (Sherif & Sherif, 1969, p. 233).

Blake and Mouton (1962) found while working with 150 groups in adult workshops, including participants from both industrial organizations and college students, that structure and norms developed after only 10 to 18 hours of group interaction. To examine the effect of problem-solving tasks upon their groups, they designed a situation within which:

intergroup relations were varied by assigning all groups a problem with the aim of arriving at the best solution possible as a group and a better solution than other groups might offer. The effects of this 'win-lose' competition on the in-groups were as follows:

1. Status relations within the groups were 'refined' and 'consolidated.' In short, intergroup competition affected the in-group structure.
2. Groups closed their ranks to pull together to win. Bickering within the groups was reduced. In other words, solidarity or cohesiveness within groups increased. (p. 263)

Problem-Solving Groups

There are particular types of "groups" which are deliberately formed by organizations. The express purpose of these groups is for maintaining integration within the

organization by (1) dealing with constantly recurring problems, and (2) for solving new or temporary problems which affect a number of departments within the organization. The titles generally given to these groups are "project teams" and "task forces".

These above two processes fall within the general category of "lateral relations" within an organization, and by their operation reduce the pressure on higher status members in the organizational hierarchy. This is accomplished by "reducing the number of decisions being referred upward" in the hierarchy (Galbraith, 1973 p. 46). Galbraith goes on to say that the major difference between project and task teams is that a ". . . task force is a temporary patchwork on the functional structure, used to short-circuit communication lines in a time of high uncertainty. When uncertainty decreases, the functional hierarchy resumes its guiding influence" (p. 51). Project teams, on the other hand, are formed around frequently occurring problems within an organization for the purpose of freeing higher-status individuals from day-to-day operational decisions.

These described work groups may be desirable to many organizations. The formation of either "task" or "project" groups provides the benefits of:

1. Reducing coordination problems between organizations or departments which have reciprocal interdependence,

2. Providing a means to efficiently handle unique or craft-type (e.g. hand tooling) tasks when they arise, and
3. Resolving conflicts between the perceived needs of different departments.

Natural groups differ from work groups in only one major respect: natural groups are self-selected entities. Their membership is comprised of individuals who have voluntarily included themselves into a sub-social system and have adopted its norms and its goals as being, to some degree, their own.

Task forces and project teams, on the other hand, are purposefully formed in an organizational environment. Assignment to one of these work groups may be influenced to some degree by its prospective members, but should not be considered as being "voluntary" for its membership in the same sense as for membership in natural groups.

Both natural groups and organizational task and project groups are also similar beyond the content of our definition of "group" on page 4. An additional similarity is that they all address themselves, as stated by Tuckman (1965), to task completion through interpersonal interaction. This interaction is also implicit within the "status and role" relations as contained in our referenced definition of "group".

In a study using a banking organization as a research base to determine optimal size for empirical groups, James

(1951) found that the optimal size for "action-taking" groups (or sub-groups) to be 6.5 members, while that for "non-action-taking" groups to be 14.0. Here, James' "non-action-taking" groups do not appear to meet our definition of "group" in the pure sense, as the requirement of face-to-face interaction would place a maximum upper limit on a group of about 12. His "non-action-taking" groups were, in all likelihood, not "real" groups at all.

Action-taking for James, however, is in reference to a group functioning in a decision-making capacity. His optimal group size of 6.5 members is relevant to decision-making groups.

James also noted that "leaders with common problems met informally in groups of two, three or more at any time the need arose. The issues were discussed, a consensus reached, and recommendations were presented to the formal authority having jurisdiction over the matter" (p. 475). It is quite possible that James' "groups" were not groups by Sherif's definition in every instance. But James' "groups" were similar to the collections of people that one might find in task-force or project-team situations.

It would appear, then, that groups could be formed with group membership being entirely composed of leaders of other groups. And this describes the membership of some task-forces and project teams which have been deliberately formed by larger organizations.

In support of the above, Galbraith (1973) points out

that for the team to be effective, membership must be composed of individuals who possess sufficient control over resources to have ". . . the authority to commit their function (department, etc.) to the team's choice of alternatives" (p. 81). Members who possess this level of authority are also in positions of power within their own departments or subunits (see p. 6 for discussion of power). Effective project-teams and task-forces, after sufficient interaction has occurred over time for norms and for status to develop, are composed of members who as individuals are usually formal leaders in their own organizational subunits, and who also possess a role and status position within the task or project group of which they are a member (Lickert, 1961; Sayles & Strauss, 1966).

Levels of Influence to be Considered

Research on the subject of group decision making should also keep in mind that there are multiple levels of influence in group decision making. As stated by Back (1979), "research on groups is . . . in the position of a tightrope walker, trying to keep in balance the infinite variety of human personalities as well as the complexities of social conditions" (p. 287). Examinations of group dynamics must both recognize and include the influences pertinent to (1) the individual, (2) the group, and (3) society. This study is an effort to examine the dynamics of group decision making while recognizing all three levels of influence.

Level One: Individual (Group Leader)Influence

Ideally, either cooperation or conflict between work group members while in a problem-solving situation will trigger a search for alternative solutions. If such a search is not triggered, then possible alternative solutions will not be shared for discussion or consideration, information is likely to be withheld by group members rather than being shared, and an individual group member who perceives themselves as being in a power position will attempt to "force" a solution of their own upon the team (Galbraith, 1973). As Galbraith goes on to explain, this type of "forcing" may actually be desirable for the organization if the organizational goals are compatible with those of the group member doing the "forcing". But in this respect, it may also be desirable for the organization to have an understanding of the influence which is present within what will become a consensual recommendation from a collection of people who have been assigned to work on a common problem.

In a formally unstructured work-group, the informal leader provides the vital functions of: (1) initiation of action, (2) facilitation of consensus, and (3) liaison with the "world" outside of the group if that should be necessary. And, unless the work-group is small, those functions are likely to be shared by several members who collectively comprise the leadership of the group (Miller, 1971; Sayles & Strauss, 1966).

In addressing the leadership responsibility of facilitation of consensus, Quay (1971) says that:

Consensus is absolutely indispensable to the work group. Without essential agreement, there cannot be any joint action at all. Consequently, securing consensus, both general and specific, is the most significant continuing function of a group leader (p. 1079).

In addressing leadership studies, Jackson and Morgan (1978) state that:

The hundreds of scientific studies (of leadership) come to one general conclusion: leadership is highly variable or "contingent" upon a large variety of important variables such as nature of task, size of the group, length of time the group has existed, type of people within the group and their relationships with each other, and the amount of pressure the group is under. . . . Leadership involves more than smoothing the paths of human interaction. (p. 62)

This agrees with Sherif and Sherif (1969) who say that "leadership" studies have had little success in identifying general personality traits which characterize group leaders across situations, but that the group leader must live up to ". . . the group's idealized conception of what a group

member should be" (p. 170). And since the interest of this study was in work-groups upon which leadership had not been imposed, and the size of the groups considered to be "small", (generally six or less), the literature indicates that there should be a single leader which emerges and provides the cited three functions for the group (p. 14).

The influence of leadership within groups has been examined in a number of different ways. Lewin (1965) saw the nature of leadership in terms of autocratic/democratic group "atmospheres". French and Raven (1959) see leadership as a function of the five perceived power bases of: reward/coercive, information, referent, legitimate, and expert power. Fiedler (1967) sees leadership as being contingent upon both leadership "style" and "situational favorableness" (relations, task clarity, and leader power).

When a problem is presented to a collection of people, the potential for discussion extends across all persons present. It has been suggested, however, that "in free and open discussions, certain personality characteristics will influence the rate of participation and the relative influence of members" (Hoffman, 1979a, p. 377).

Extroverted, self-confident, and socially aggressive members are likely to dominate group discussions, influence decisions, and be perceived as being the group "leader" by other group members (Blake & Mouton, 1961). But the relationship between member participation and influence in group decisions does not appear to be either that simple or

very strong. In fact, Hoffman (1979b) reports that most studies show "the correlations between participation and nominations for leadership tend to be moderate, at about .40" (p. 133), and suggests that rates of participation and influence over group decisions are independent of each other.

But if "participation rates" are measured in terms of acts actually carried out by the group (as done by Bales, 1951), then those persons who initiated the acts tend to be perceived as being influential within the group by the other group members. This position is consistent with our use of the term "effective initiative" (p. 8 in this thesis), and therefore becomes an issue of leadership. Effective initiative may be measured by use of sociometric techniques; this will be expanded upon in Chapter 3.

When engaged in creative decision-making tasks (as opposed to one correct solution to a problem), Reicken (1958) found that the most talkative group member, regardless of the quality of their information, still exerts considerable influence over the group's decisions. Reicken suggests that the amount of (or lack of) opposition to the talkative member's solutions is much less a factor for its successful adoption by the group than is the amount of support they may win from from other group members. However, a long discussion per se does not translate into influence within the group. As stated by Hoffman (1979), "the amount of discussion concerning a particular solution

is not predictive of that solution's adoption by the group" (p. 134). Therefore, it appears that neither the length of discussion of a creative solution to a problem, nor the level (or lack) of opposition to proposed solutions relate strongly to a member's influence within the group relative to a particular problem. Rather, successful influence appears to be determined by the amount of support that can be generated for the solution.

Level Two: Group Influence

Experimental studies on the effect of "group" pressure and conformity were frequently a simple consensus of a majority of those people brought into a laboratory. Depending upon the degree of structure inherent in the particular situation or task, e.g. Sherif's autokinetic studies versus Asch's matching lines, individuals, when outnumbered in unstructured decision tasks, tend to agree with the majority opinion even when they internally disagree (Asch, 1956; Sherif & Sherif, 1969). Individuals are also likely to internalize those norms formed in the laboratory in relation to highly unstructured stimuli and pass them on to successive generations of subjects (Asch, 1956; Jacobs & Campbell, 1962; MacNeil & Sherif, 1976; Sherif & Sherif, 1969). The autokinetic studies have involved "real" groups as well as ad hoc collections of people.

The research cited above enables a researcher to examine the effect of the "group" upon the judgments and decisions made by an individual. The conclusion of these

studies is that if a decision is to be made where there is a high degree of uncertainty in the task, then the influence of the "group" will be high.

Level Three: Social (Society) Influence

The individual norms of the group members serve both as anchorages for the suggestions made by the members, and as substitutes for direct interpersonal influence to regulate members' behaviors (Sherif & Sherif, 1969; Thibaut & Kelley, 1959; Tuckman, 1965). "Most problem-solving groups (also) operate under a norm of rationality, that is, that 'reasons' must be given to justify members' suggestions" (Hoffman, 1979b, p. 173).

For a social problem where there is no one "correct" solution such as The Fallout Shelter Problem (see Appendix B), suggesting the inclusion of certain people to be "saved" at the expense of the lives of others requires justification to the other group members. This is particularly true when those persons to be "saved" must also be ranked by order of preference. Whether personal norms are a function of personal values (or vice versa) is not the issue here. What is important is that the normative values of the group members, whatever their source, will serve as anchorages and become the resource base from which arguments will be made.

Social Norms and Sex Roles of Leaders

With respect to sex differences and influence in decision making, the literature is somewhat mixed. Whittaker (1965) reports that, in an autokinetic situation,

"both males and females were influenced by the male confederate, but the females were influenced to a much greater degree. With the female confederate, on the other hand, both sexes revealed a net negative change" (p. 93).

But a study by Piliavin & Martin (1978) examined interaction within groups as measured by Bales' revised category analysis. When examining the effect of mixed-sex group composition upon members, Piliavin & Martin suggest that internalization of social norms produces a situation where "sex roles operate relatively independently of situational factors such as the sex composition of the group males and females would be expected to engage in significantly different patterns of behavior, but the (sex) composition of the group with which the individual is interacting should have no effect on his or her behavior patterns" (p. 283).

It is significant to note that in the absence of an authority figure which reinforced only male participation, "females interacting in groups with males perform in a somewhat more task-oriented and less socioemotional way than they do in all-female groups, while males are unaffected" (p. 293). Although women still engaged in more socioemotional behaviors than men, and men in more task behaviors than women, "there is no evidence that females are suppressing their task orientation because of the presence of males" (p. 293).

This position is supported by Morelock (1980), who

points out that "the literature on sex differences in compliance does not unequivocally demonstrate that females are more easily influenced than males published research has found a significant main effect of sex in less than 40% of the studies" (p. 538). Morelock goes on to suggest that compliance in a group decision-making task is higher for males when the topic is a female sex-role-related item, and vice versa.

Much has been printed in reference to males generally possessing superior quantitative and spatial skills to women. But by using a category-width scale to determine the relative degree of extreme/conservative judgments to decision problems, Wallach & Kogan (1959) report that although males tend to be more extreme and daring than females in their judgments in problem solving requiring the use of quantitative and spatial skills (task orientation), that the opposite occurs when evaluations of personality characteristics of other people are solicited (social orientation). When considering "sex differences in social desirability ratings of personality traits, . . . women make more extreme positive or negative judgments" (p. 556). They go on to conclude that "women were found to be more conservative than men when unsure of their decisions (problems involving risks of income loss, death, and a football defeat), and more extreme than men when very sure of their decisions (problems involving an uncertain artistic career and a potentially unhappy marriage)" (p. 563).

Klopfer & Moran (1978) point out that there are two basic types of rules that groups may use to achieve a decision: the majority rule, and the consensus rule. But by using same-sexed decision "groups", they could find no male/female differences between majority or consensus ground rules and resistance to pressure from other "group" members.

By using "expectation states" as a theoretical base, Lockheed & Hall (1976) postulate that sex meets the requirements to be considered to be a status characteristic. If sex is a status characteristic, then the male state is predicted to both be a more valued state, and "will be more likely to hold positions of power and prestige in mixed-sex groups than will females" (p. 115). They showed that males in mixed-sex task-oriented "groups" emerged as informal group leaders four times as frequently as females (with females often in the second position).

Fennell, Marachas, Cohen, McMahon & Hildebrand (1978) point out that in the literature reporting on sex differences in group behavior, "a considerable number of the studies do not have sex differences as their main focus sex is often considered only as a control variable. If differences are observed, they are usually explained after the fact by a post hoc application of the sex-role socialization argument" (p. 591). They go on to suggest that because the social sciences have not been generally successful in identifying the "socialized" differences between male and female interaction in the group problem-

solving process, that we cannot reliably study them unless we develop a priori explanations of the behavioral differences that do exist. Fennell et al. go on to cite the above-described Lockheed & Hall research as adequate in design, and accept their results with mixed-sex "groups" as being valid.

While using male and female managers in simulated business activity, Arnett, Higgins & Priem (1980) found that "female managers as a whole were not less well liked than male managers either by subordinates as a whole or by male subordinates in particular" (p. 149). They go on to conclude that evaluation of females who proceed with a positive personal manner within a leadership situation will not be judged on the basis of appropriate sex-role behavior, but will be judged in terms of appropriate leadership-role behavior.

But as lamented on page 4 here, none of these studies was conducted with real groups. Participants in all of the referenced studies were unacquainted with each other. In this present study, once "real group" structure was given sufficient time to develop, it was expected that female members of groups would generally be closer to the overall normative solution to this hypothetical social problem (The Fallout Shelter Problem) than would be the male members. This prediction was based upon the assumption of females, in general, to be more adept in socioemotional situations than are males. And if females do not suppress their task

orientation simply because males are present within the work group, and are judged by their other group members in terms of appropriate leadership-role behavior rather than appropriate sex-role behavior, then their influence in the group should be high.

Chapter 2

Problem and Hypotheses

Description of the Problem

If the purpose of project teams and task forces within an organization is to fulfill the purposes of coordination for unique problem solving and for conflict resolution, then the influence of any particular work group member within these groups and the norms under which they operate may be of interest to those who form and utilize such groups. The focus of this research was on these particular types of work groups, and on the influence of social norms, group consensus, and the "unofficial" group leader(s) in their decision-making process.

The fundamental question to be answered was, "does the emergent group leader impose his/her own decision upon the members?" If not, the secondary question would ask "would the interpersonal interaction within the group involve a more or less equal exchange of opinions across the group membership which would lead to a more or less equal contribution of all to the decision?" If leadership does have a disproportionate amount of influence, then a method to measure it must be employed. Once the amount of relative influence of the group leaders is measured, then the strengths of the relationships of additional variables may be compared to it.

The additional variables to be examined in this study were (1) how close together were the participants to each other with their solutions to a problem with no single "correct" solution before the work groups were formed, (2) how close were the group leaders to the overall normative solution to that problem, and (3) the sex of the work group leaders.

Based upon the research cited in Chapter One, it was expected that social norms have a measurable influence upon unanimous decisions reached by the group. It was also expected that the sex of the informal, emergent group leader would be somewhat predictive of the decision made by the group if the social norms are known by the researcher.

It was not the purpose of this study to explore the relative merits of individual versus group decisions on the basis of organizational economic effectiveness (cost in terms of manpower expenses, etc.). Nor was the focus on the superiority/inferiority of group versus individual decisions, on the "risky-shift", on the "conservative-shift", nor on "lower-level" decision groups. Lower-level decision groups here refers to lower-status employees who are deliberately formed into groups for the single purpose of making decisions which will be acceptable primarily to their peers, such as arrangements for a company picnic, deciding on a color to paint a washroom, etc. Rather, the focus of this study was at the decision-making level where the quality of decisions is of primary importance to the

organization, and where personal values or vested interests are likely to have an effect. The methodology for dealing with each of the following problems is discussed in Chapter 3.

Process Problems

The research problems now became those of:

1. obtaining access to functioning work groups which meet the cited requirements of "group",
2. identifying within a population a "normative" solution to a social problem,
3. identifying the "normative" solution to the same social problem as it exists across work groups,
4. identifying the emergent leader within each work group, and
5. measuring the influence of the emergent leaders upon their group members when unanimous agreement is required for success in a decision-making task.

Research Hypotheses

On the basis of the cited research and within the dimensions of the operational definitions presented, the following hypotheses were advanced and tested. "Normative solutions" are assumed to be representative of social norms across the research participants as a population.

Hypothesis One

There will be a significant relationship between the normative solution which exists across all work group members (at the beginning of the semester) and the normative

solution resulting from the unanimous group agreements of the work groups at the end of the semester.

Hypothesis Two

The normative solution of the artificial comparison "groups" at the end of the semester will be the same as that of the work groups.

Hypothesis Three

The females who emerge as informal group leaders will be closer to the normative solution to the problem as it exists both across the group members, and across the unanimous group solutions, than will be the male emergent group leaders.

Hypothesis Four

Females will tend to emerge as informal group leaders where the group members are highly divergent from each other with their initial, individual solutions.

Hypothesis Five

Males will tend to emerge as informal group leaders where the group members are relatively close together with their initial, individual solutions.

Chapter 3

Methodology

All instructions given to all participants (1) made it clear that their participation was appreciated but not required, and did not reflect in their respective course grade in any way, (2) that all collected data were strictly confidential, and (3) were so general that the purpose and hypotheses of the study would not have been known to them. "Process problems" in the text shall refer to those research problems presented on page 28. "Phase" shall refer to different stages in the research project. That is, Phase One was the collection of the individual solutions (second week of the semester), Phase Two the sociometric rankings (tenth week), and Phase Three the unanimous group solutions (thirteenth week).

Obtaining Access to Work Groups

To satisfy process problem number one, work groups were composed of upper-level undergraduate students at Oklahoma State University. One section of Psychology 3113 (Comparative Psychology), one section of Psychology 3413 (The Psychology of Social Behavior), and one section of Psychology 3643 (Applied Community Psychology) deliberately placed students into work-groups at the beginning of the Fall 1981 semester. Students were assigned to groups randomly, balanced by sex, and remained in their respective

groups throughout the semester.

The students in Psychology 3113 completed weekly examinations, first as individuals, and then again as groups, with all members within each group receiving both an individual and a group grade for each examination. Agreement of all group members was required for all group examination answers (short essay), and this group grade accounted for forty percent (40%) of each student's final grade for the course.

The students in Psychology 3413 were required to complete two group projects either of their own design or selected from reference books in social psychology. Each of these projects was presented first as a proposal, the proposal was executed "in the field", and each project was then summarized in a short paper by the group for a grade which was given to all participants. These groups tended to sit together during class, meet outside of class in planning sessions, and make their own decisions on who would proceed with what responsibilities. The only required contact of these project-groups with a "higher authority" was in obtaining approval to proceed with their proposals. No leadership structure was imposed upon the groups. The quality of the group projects determined thirty percent (30%) of the final grade for this course. In this course, however, the students themselves listed on their short papers the names of only those group members who the group agreed were active participants deserving of a grade for the

project.

The students in Psychology 3643 were assigned to work groups with the task of each group being to "set up" a hypothetical social service organization within a community. Each group was required to write a proposal, to "hire" a staff, to "select" a board of directors, to write a budget, to write a program, and to write an evaluation of their program. This group project accounted for fifty percent (50%) of each student's course grade. As with Psychology 3413, the students listed on their papers only those group members who the group agreed were active participants deserving of a grade for the project.

The above sections were expected to provide 16 project groups, five groups of four each from Psychology 3113, seven groups of six each from Psychology 3413, and four groups of four each from Psychology 3643. The majority of student participants were non-psychology majors.

Under these circumstances, all elements were be present for "real" group formation to occur, including two variables usually difficult to provide for in experimental research on groups: (1) time for natural development of norms, roles, and status relationships, and (2) a "real" goal which is of personal value to the individuals, and which could not be attained by individual members, alone. In these respects, the above-described project-groups (teams) very closely approximate task-forces and project-teams formed in organizational settings. They also meet all other

requirements to be considered to be "real groups" as defined here by both Sherif and Sherif (p. 4 and p. 8 of this thesis), and by James (p. 13 of this thesis).

Comparison groups were composed of students enrolled in academically equivalent classes which did not group their students. These comparison participants were randomly (and balanced by sex) placed into artificial ad hoc "groups" when the researcher returned to their classes for the final phase of the study.

Identifying Normative Solutions

Phase One: for process problems two and three, a social problem where there is no one "correct" answer, the Fallout Shelter Problem was employed (Simon, Howe & Kirshenmaum, 1972; see Appendixes B and C). The problem required participants to list people who were to be "saved" at the expense of the lives of others. When carried out in the group situation this required justification to the other group members for the choices made. This was particularly true when those persons to be "saved" were also ranked according to a unanimous group solution. Ranking allowed measurement both of different selections between work group members, and if taken more than once, of the change of selection order of any comparison or work group members over time. The ranking also allowed identification of the "normative" solution for the problem. The problem was given to all participants to be assigned to either work or comparison groups before any of the real groups were formed.

The values of each group member then served as anchorages and became the resource base from which their arguments would be made.

Identifying Emergent Work Group Leaders

Process problem four was satisfied as follows (Phase Two). Since the membership of these research groups had been determined by authority, i.e. by the instructor, there was no problem in identifying the groups, themselves, as there might have been with "natural" groups.

This study looked at leadership as did Bales (1960), Sherif & Sherif (1969), and Stogdill (1974): in terms of "effective initiative" (see p. 8) and identified group leadership rankings by use of a sociometric instrument (Moreno, 1953; MacNeil, Davis & Pace, 1975) which work group members completed individually on the tenth week of their semester (Phase Two; see Appendix A). There was no apparent connection between this instrument and the rest of this project. The instrument was administered by either the course instructor as a part of the course material, or by a confederate under the pretext of conducting other research. The comparison participants were not involved for obvious reasons. Although there were six sociometric questions, only question number one was used to identify the leader of each group. Question number one said: "List in order, from most to least, the persons in your group who come up with ideas and suggestions that the group actually carries out. No ties. Include yourself." In addition to the instrument

identifying the group leader as a function of effective initiative, the potency dimension also allowed measurement of how much effective initiative, relative to all other group members, was attributed to each group member by all other group members.

A sociometric device is an effective tool for identifying the individual(s) within each group who are perceived by the other members as being most effective and most competent in contributing to group functioning, as would be predicted by Exchange Theory (Thibaut & Kelley, 1959; Blau, 1968; Shaw, 1971). The sociometric instrument also contained an innovative potency dimension which is quantifiable to compare leadership strength both within groups and between groups. In addition to question number one identifying the group leader as a function of "effective initiative", this potency dimension also allowed measurement of how much effective initiative, relative to all other group members, was attributed to each group member by all other group members.

Each person within each work group was assigned values for the rankings on sociometric item number one which were given to them by all members of their group (including themselves). Each rank of "first" was given a value of "4", rank of "second" a value of "3", rank of "third" a value of "2", and all lower rankings a value of "1". As used by Moreno (1953) and MacNeil (1975), the mean of this dimension of item number one was the basic criterion for leadership

identification. The hash-mark indicating how much "effective initiative" was quantified by segmenting the possible range into ten equal units, and then measuring from the end-point of "not at all", with "very much" having a maximum value of ten. The mean of these measured values for each individual could then be used in conjunction with their ranking mean to represent their overall leadership strength relative to all other individuals within their work groups. One "leader" was identified in each group by looking first at their mean ranking value as the basic criterion for selection as leader, and then to their mean potency value for occasional tie-breaking situations which might occur.

Measuring Leader Influence

To satisfy process problem five, the researcher returned to all participating sections on the thirteenth week of classes (Phase Three). The comparison section participants were placed into ad hoc artificial groups; the experimental section participants remained in their work groups. All participants were given the same Fallout Shelter Problem as they had on the second week of classes, but the answer sheets were revised to require a single solution for all participants who were present (see Appendix D).

Since the leader within each work group had been identified by the use of sociometrics, all that was necessary then was to measure how much each group leader changed from their first, individual solution relative to

all other members within their own work group. It was expected that the females in general, and the female "leaders" in particular, would change the least between their first individual solution to the ranking problem, and the final unanimous group solution at the end of the semester.

Determining Individual Normative Solution

The individual rankings from the Phase One "Fallout Shelter Problem" were coded as follows: the number corresponding to their rank position (1 through 10) was assigned to each of the ten "persons" in the problem. The coded values for "a" through "j" were used to determine how dispersed each collection of people was before any of the group formations were announced. This was accomplished by comparing each participant with each other participant who had been assigned to their work group, item by item. The ranked difference between each rank-ordered item from "a" to "j" was determined (i.e. a = 1 versus a = 5 equals a difference of 4), that value squared, and all squared values were added up. This sum of the squared differences was computed between all persons to be assigned to each work group, and those sums were summed. The mean of those summed-summed differences squared supplied a value to represent how close (or far away) the participants who would be later assigned to the same work groups were, on the average, from each other with their initial, individual solutions (Osgood, Suci & Tannenbaum, 1957).

The normative solutions for both the grouped and the comparison participants were determined by recording the total number of times each of the 10 "persons" in the problem (from "a" through "j") was selected for each ranked position from "1" to "10". By proceeding from position "1" to position "10", the "person" most popular at each ranked position was selected for that slot. In the case of "ties", the "person" in the problem with the highest cumulative total to that point was selected. This sequential stratified modal approach was adopted because it most closely approximates a polling or voting pattern. That is, for each level of the normative solution the "person" not already selected and who was most popular at that point was selected as the next entrant into the shelter.

Determining Amount of Individual Change

To determine the amount of group member change between their individual solution and their agreement to what became a unanimous group solution, another sum of the differences, squared and added up was computed for each participant between what had been their first solution, and the final unanimous "group" decision. The amount of change was then compared with (1) leadership position, (2), diversity of the work group, (3) sex of the participant, and (4) by calculating additional sums of the differences squared, participant distances from any of the "normative" solutions.

The four sections provided an initial 16 work groups (see Table 1). The majority of student participants were

business administration majors taking coursework outside their major area of study.

To provide comparison groups, students were recruited from five sections of the same or equivalent courses in which students were not placed into work groups. These latter students provided a baseline for later comparison of differences between real work groups with status structures and ad hoc aggregates of people, all working on the same task. During the eleven weeks separating Phases One and Three, eight participants from the real work groups were lost to attrition. No work group lost more than one member. Attrition from the artificial ad hoc comparison "groups" is a moot point; only data from those actually participating in Phase Three are included in the analysis. Group size for all conditions is summarized in Table 1.

Table 1
Group Membership Data

Initial Work Group Membership of Groups Beginning the Project		Final Work Group Membership of Groups Completing the Project	
Number of <u>Work Groups</u>	Number of <u>Members</u>	Number of <u>Work Groups</u>	Number of <u>Members</u>
3	3 = 9	5	3 = 15
3	4 = 12	3	4 = 12
5	5 = 25	6	5 = 30
4	6 = 24	2	6 = 12
<u>1</u>	7 = <u>7</u>	<u>—</u>	<u>—</u>
n= 16	77	16	69
		males = 35	
		females = 34	
Initial Comparison Membership of Students Beginning the Project		Final Comparison Membership of Students Completing the Project	
Number of Members		Number of Members	
n= 78		78	

Chapter 4

Results

The initial rankings from Phase One (individual solutions) for the 77 participants who were later assigned to work groups were tabulated to determine which selections, overall, were most ranked in what order (were most popular). By proceeding from rank position "1" to "10", the "person" most popular at each ranked position was selected for that slot. In the case of ties, the "person" with the highest cumulative total to that point was selected.

This, then, provided a measurement of the differences between different participants' solutions, and the amount of change experienced between each participant's initial ranking and the final, unanimous ranking made by their own group. In the work groups, it was expected that the "leader" would generally change the least, and "lower status" members would generally change the most. In terms of outcome, none of the five hypotheses were supported by the results.

Group Variability

The individual rankings from the Phase One "Fallout Shelter Problem" were coded as follows: the number corresponding to their rank position (1 through 10) was assigned to each of the ten "persons" in the problem. An example of the method used to code the data may be seen in

Table 2.

Table 2
Sample Problem "Solution"

Description of "Person"	Ranked "Solution"	Data Coding
a. Bookkeeper . . .	1. (b)	a. = 2
b. His wife	2. (a)	b. = 1
c. Male black . . .	3. (c)	c. = 3
d. Female historian . . .	4. (g)	d. = 5
e. Male bio-chemist . . .	5. (d)	e. = 7
f. Rabbi or	6. (h)	f. = 8
g. Female olympic	7. (e)	g. = 4
h. College coed	8. (f)	h. = 6
i. Policeman with	9. (i)	i. = 9
j. Female actress	10. (j)	j. =10

The coded values for "a" through "j" were used to determine how dispersed was each collection of people before any of the group formations were announced. Each participant was compared with each other participant who had been assigned to their work group, item by item. The difference between each rank-ordered item from "a" to "j" was determined, that value was squared, and all squared

values were then added up. This sum of the squared differences was computed between all persons to be assigned within each group, and those sums were then summed. The values for group 11 in this study are shown in Table 3 as an example of this process.

Table 3
Mean of the Sums of the Sums of the Differences,
Squared, Between All Individuals
In Group 11

Matrix

Group Member Number:	1	2	3	4	5	6
1	0	120	90	130	56	40
2		0	126	138	60	72
3			0	126	30	62
4				0	132	130
5					0	32
6						0

total = 1344; mean = 89.60

The mean value for Group 11 of 89.60 could now be used as a measure of the initial divergence of its members to compare, relatively, how divergent were the members of group

11 compared to all other groups. This calculation was performed for all 16 work groups, and later for the 16 ad hoc comparison groups. The initial solutions for the comparison members were not coded until after all data were collected. The same analysis was then performed on those aggregates of people (ad hoc groups) who later worked out a unanimous solution together.

Phase Three produced 16 work group solutions to "The Fallout Shelter Problem", plus 16 "instant interaction" unanimous ranking solutions from the persons who were randomly assigned to the 16 ad hoc artificial groups. Before a valid statement could be made concerning the amount of "change" of any of the work group leaders, it was necessary to compare overall diversity within the artificial groups. As shown in Table 4, statistically, both the experimental and the artificial groups may be considered to have come from the same population for the initial group divergence data.

As shown, the probability of the two types of "groups" exceeds .20. This means that in terms of member diversity within their own groups on their first, individual solutions to the problem, that the members of both the work groups and the ad hoc artificial groups may be considered to have come from the same population. That is, in terms of individual diversity, the participants within both work groups and artificial groups were the same.

Table 4
Initial Diversity of Group Members
Within Each Group as a Unit

	Range of the Means	Mean of the Means	SD
Work Groups, n = 16	65.80 to 152.20	109.32	24.64
Ad hoc Groups, n = 16	77.60 to 147.53	110.12	21.33

$t = .4690; p > .20$

Group Member "Change"

Another sum of the differences, squared and added up was computed for each participant. But this time, differences were between what had been each participant's first and second ranking solutions. For the members of both the work and ad hoc artificial groups, this step disclosed how much each member changed relative to each other member within their work group while coming to a unanimous agreement for a common solution.

The mean change was calculated for each work group and for each ad hoc artificial group. The results of that comparison are shown in Table 5.

A t-test has established that the amount of change which occurred within the work groups was significantly more than which occurred within the comparison groups $\{t(30) =$

2.40, $p < .05$). The amount of change for each work leader was then compared with that of each other member within their own group. Three categories were formed to identify those leaders which were most extreme in their change, i.e. whether the work group leaders changed absolutely the most of everyone within their group, absolutely the least, or fell somewhere between those two extremes.

Table 5
Individual Change Within Groups From
Phase One to Phase Three

	Range of the Means	Mean of the Means	SD
Work Groups, n = 16	41.33 to 179.20	78.19	32.74
Ad hoc Groups, n = 16	46.40 to 130.00	82.47	19.98

$t = 2.359$; $*p < .05$

The mean of the individual member's changes within the 16 work groups (Table 5) were then sorted on their median to form categories of "high" and "low". This sorting (Table 6) identified whether a work group's members, on the average, changed more from their original ranking solution than did most of the other work groups, or whether they changed less.

Table 6
 Categories of High and Low Member
 Change Relative to Amount
 of Leader Change

Amount of Leader Change (absolute) Movement of Individual Group Members vs. Their Own Group's Unanimous Solution

		Low	High			Low	High
Most		16 (1)	3,15 (2)	Most = Least		16,17,21 (3)	2,3,13, 15,23 (5)
		1,11,12 17,21, (5)	2,13,23 (3)			1,4,5 11,12 (5)	4,22,24 (3)
		4,5 (2)	14,22,24 (3)				
Intermediate							
Least							

note: the numbers assigned to the work groups do not correspond to the number of groups involved in the study. exact p = .31

As shown in Table 6, this procedure created a 2x3 matrix for 16 work groups which gave a visual impression of the relationships, but with cell values unfortunately too

low for statistical analysis. To bring the six "cells" up to values high enough to test for significance, the leaders were re-sorted into categories of either having changed simply more or less than the median group members' change within their respective work groups. This procedure created a 2x2 matrix which could then be tested with a Fisher's Exact Probability Test. It should be noted that the amount of leader change was qualitatively changed to a more conservative treatment by this process.

As may be seen by the exact probability of .31, there was no significant relationship between the amount of leader change and the amount of overall members' change within their respective work groups. That is, whether the leader either changed a lot or changed little was not significantly related to how much all group members changed.

Comparison of Normative Solutions

To test Hypotheses One and Two, the 32 group-related consensus rankings from Phase Three were then tabulated to determine the normative solutions in the same way as were the individual solutions for Phase One. All ways of looking at the data from those two operations are provided in Table 7(a), and with a Spearman r' matrix in Table 7(b).

All normative solutions were determined by a sequential stratified modal method which is described on page 37 of this thesis. Each of the normative solutions was then compared with each of the other normative solutions by use of Spearman Rank Correlations.

Table 7 (a)
Normative Solutions for the
Fallout Shelter Problem

"Person" in Problem:	Grouped Subjects		Comparison Subjects		Overall Subjects	
	Ph.1 n=77 (a)	Ph.3 n=16 (b)	Ph.1 n=78 (c)	Ph.3 n=16 (d)	Ph.1 n=155 (e)	Ph.3 n=32 (f)
A	2	2	2	2	2	2
B	1	5	1	1	1	1
C	3	3	5	3	5	3
D	5	7	3	5	3	5
E	7	1	7	7	7	7
F	8	8	8	8	8	8
G	4	10	4	10	4	10
H	6	4	6	4	6	4
I	9	9	9	6	9	6
J	10	6	10	9	10	9

Note: Ph.1 = individual solutions

Ph.3 = unanimous group solutions

When presented in table form as in Table 7(b), the mean of each column may be used to judge how representative that column (normative solution in this case) is of all relationships in the table. As shown, the normative

solution for the individuals who were later assigned to real work groups was most representative of all normative solutions. The normative solution for the unanimous group solutions from those same participants, however, was least representative of all normative solutions. That is, Hypotheses One and Two were not supported.

Table 7(b)
Spearman Correlation Matrix

	a	b	c	d	e	f
a	-	.32	.95	.70	.95	.70
b	.32	-	.22	.55	.22	.55
c	.95	.22	-	.65	1.00	.65
d	.70	.55	.65	-	.65	1.00
e	.95	.22	1.00	.65	-	.65
f	<u>.70</u>	<u>.55</u>	<u>.65</u>	<u>1.00</u>	<u>.65</u>	<u>-</u>
	.724	.372	.694	.71	.694	.71

Group Leader Influence

To test Hypothesis Three, the initial rankings of the work group leaders were first compared with the unanimous work group rankings "normative" solution as shown in Table 7(a), again using the sum of the differences squared method. Another 2x3 matrix was constructed, this time examining the

group leaders' relative closeness to the unanimous work group "normative" solution. The results of that comparison are shown in Table 8.

Table 8
Comparison of Initial Group Leader Rankings With
Unanimous Across-Group "Normative" Solution

Amount of Leader Change (absolute)		Leader Divergence From Across-Group "Normative" Solution					
		Low	High				
Most	15,16 (2)	1 (1)	=	Most	3,15,16 17,21 (5)	2,3,23 (3)	
	13,13,17 21 (4)	1,2,11 23 (4)			Least	5,12,24 (3)	1,4,11, 14,22 (5)
	5,24 (2)	4,14,22 (3)					

exact p = .31

The Fisher's Exact Probability Test shows no

significant difference (exact $p = .31$). This indicates that there was no significant difference between the relative amount of change by the leaders within their own groups compared to their other group members, and how divergent they were from the overall "normative" solution from Phase Three. Hypothesis Three was not supported.

To test Hypotheses Four and Five, the relationship in Table 8 was finally compared with the initial relative divergence of the groups (see Table 3 for an example). The relationship between these three variables, and the sex of the informal work group leader, is summarized in Table 9.

Hypotheses Four and Five were not supported. The overall male/female ratio of the 16 work group leaders was that eight were males and eight were females.

As shown in Table 9, the amount each leader's change within their own group relative to the other group members, the initial divergence of each group's members from each other, the leader's divergence from the initial overall grouped individual "normative" solution, and the sex of the emergent group leader appear to be unrelated. Of the 16 work groups, none were evenly split with male and female members. Seven of the work groups had more male members, and the remaining nine more female members. There was no relationship between majority of members' sex (up to and including a majority of two) with the sex of the emergent work group leader. There were no work groups with a majority greater than two, except that two groups were

composed exclusively of males.

Table 9

Sex of the Work Group Leader as a Consideration in the Comparison of Leader Change, Leader Divergence From the Across-Group "Normative" Solution, and Initial Group Divergence

Leader Divergence from "Normative Solution		Low	Low	High	High
Initial Group Divergence		High	Low	High	Low
Amount of Leader Change (absolute)	Most	F (1)	M (1)	F (1)	0
	Inter-mediate	F (1)	M,M,F (3)	M (1)	M,M,F (3)
	Least	M,F (2)	0	M,F (2)	F (1)

In reference to the fundamental question of whether the

emergent group leader tended to impose his/her own decision upon the other group members, these results suggest that this was not the case. The results also suggest that there was not a more or less equal contribution of all members within the real work groups to the ultimate unanimous solution of the group, as illustrated in Table 7(b).

It was of interest to discover that use of the sociometric instrument to identify emergent leadership within groups produced results substantially different from what would have been produced by another method. Had "leadership" been defined simply as the person within each work group who changed the absolute least of all other group members (and therefore had more influence), then the data would have shown there to be nine male and seven female leaders. Looking within each group, the data also show that there were seven male and nine female group members (all statuses) who changed absolutely the most of everyone within their respective groups. Leader change was "intermediate" in eight of the 16 work groups. The addition of the potency factor to complement the effective initiative ranking value appears to be useful as a "tie breaker" for the first position which may occur from time to time even though group structure appears to have been formed. The leaders were still primarily identified by their ranking values.

Chapter 5

Discussion

The functioning of groups is a complex phenomenon which should be examined at both the individual and the interpersonal levels of analysis. And decision making within groups is but one component of group functioning. It is, itself, a complex phenomenon. It is known that group structure can emerge among persons who interact over time while pursuing a common goal. And the amount of influence of any one individual upon what emerges as a unanimous group decision may be beneath the threshold of awareness of even the group members themselves. A method to both identify the source of a group's "guiding influence" and to predict the impact of that influence upon the decisions made by the group may be of interest to those who utilize groups in a decision-making capacity. The search for the variables for measurement to accomplish this identification, and their influence, underlies this study.

The results as shown in Table 6 suggest that the change of the work group leader on their group consensual decision was no more than by chance: groups did move to the initial solutions of 5 of the 16 leaders, but 3 other leaders changed more than anyone else within their group, and the 8 other leaders fell somewhere between those extremes. The explanations which first come to mind to explain these

results include those which could be explained by theories of autocratic/democratic, etc. leadership "styles", by "atmospheres", by types of "power", or challenged on the grounds that the problem to be solved was not "real" and that the quality of its solution had no utility for the participants. It might also be claimed that the emergent group leaders had no influence within their groups and the above results occurred by chance.

Further analysis of the data as shown in Table 7(b), however, presents a picture which is more complex than which could be explained by any of the above arguments. The first, individual "normative" solution across all work group members is most representative of all other work group/ comparison group combinations of normative answers. One might therefore expect that their final, normative solution across their unanimous solutions would also be close to all of the others. Not only was that not the case, but their final solution was actually the least related to all of the others. There was less change between Phase One and Phase Three across the ad hoc comparison groups. The work groups changed the most.

If leadership is validly defined in terms of "effective initiative", then one should expect the leaders to influence the unanimous solutions of their groups and cause the other members to move closer to the leader's own first solution than the leader moves away from it. This is exactly what happened in a previous study (Fulton, 1981; see Table 10).

Table 10
 (From Non-Replicated Previous Research)

Leader Divergence from "Normative" Solution		Low	Low	High	High
Initial Group Divergence		High	Low	High	Low
Amount of Leader Change	Most (absolute)	0	0	F,M (2)	M,M,M,M (4)
	Inter- mediate	F,F (2)	F,F,M (3)	F,M,M (3)	M (1)
	Least	F,F,F,F (4)	F,M (2)	0	0

As shown, when the group members were highly divergent from each other in their first solution, and the leader had been close to the "normative" solution in the very beginning, the leaders appeared to have influenced the group decision. The exact opposite occurred when the above conditions were reversed. There were also significant sex differences, with the female leaders being generally closer

to the "normative" solution and emerging in groups which were highly divergent. That is, most of the female leaders changed the least, and most of the male leaders changed the most.

The previous findings as displayed in Table 10 were not supported in this research. But to say that the work group leaders had no influence is also contradicted by the results from this study. As shown on Table 7(b), the correlation between the work groups' first and second solutions (a, b) was $r' = .32$; that for the ad hoc comparison groups (c, d) was $r' = .65$. The work groups moved away from their first normative solution to a greater degree than did the comparison groups.

In terms of overall sex differences in the degree to which both participants and their groups differed from the normative solutions for both the individual normative solution and the subsequent unanimous work group normative solution ("a" and "b" in Table 7a), males and females as populations working in real groups were not significantly different. The mean differences for males in real work groups were (a) 95.03 (male population versus grouped individual normative solution), and (b) 113.73 (their unanimous group solution versus the real work group normative solution). The mean differences for females in real work groups were (a) 77.65 and 101.55. In the comparison "groups", however, the findings were somewhat different. There was also no difference between comparison

males and females in their mean distance from the comparison individual normative solution, but where interaction was required for their unanimous ad hoc "group" solutions, the difference between the male and female participants was significant. The mean male difference was 120.06, but for females the mean was only 96.25, $\{t(76) = 2.3144, p < .03\}$. This means that comparison females were more likely to be in a "group" whose unanimous solution was close to the normative solution, and males tended to be in groups whose solutions were farther away.

Something occurred within the work groups which did not occur within the ad hoc comparison groups. The development of group "structure" over time is the most obvious difference which is known. But that certainly does not explain the results. In fact, status structure would predict just the opposite of what happened here.

In comparing the overall designs of the previous and present research models, there were several changes which may account for some of these differences in findings. The first change relates to the "Fallout Shelter Problem" answer sheet instrument itself. The previous research had all participants rank only their first six choices (the people who were to be "saved"). Those not selected were also not ranked on the answer sheet. This present model required the participants to rank all ten people, with those to be "saved" clearly identified on the form. Believing that there was a possibility for any of those "persons" who were

"left out" to perhaps still "get in" because of extraneous circumstances may have created a different cognitive set for the participants.

There is also no way to go back and recreate the correlation matrix in Table 7(b) for comparison. In this study the (later to be) grouped and artificial ad hoc grouped first, individual normative solutions correlated at $r' = .95$, but the work group first and work group unanimous solutions at $r' = .32$. Unfortunately, the comparison participants in the previous study were not placed into ad hoc artificial groups for their final solutions, but answered individually again the second time. There was no ad hoc unanimous "normative" solution in the previous study with which to make comparisons. Although comparisons of this type would say nothing about the unexpected results within the work groups, they might shed some light on whether or not the above-mentioned change in instrument design had an effect.

Perhaps the most critical difference between the two studies was the number of people involved. The present study was smaller due to non-availability of work groups as described here. Not only was the number of work groups smaller in this study, but the groups themselves were composed of fewer people. In the previous study there was only one work group of three people out of 21 work groups; in this study there were five out of 16 groups. The average work group size in the previous study was 5.52; in this

study it was 4.31. And in the previous study, almost 90% of the participants were in groups of five or more members; in this study it was only 61%.

In an effort to explain these differences, a small study was conducted in the fall of 1983. Only seven work groups were available to be used, but the mean group size was 5.71 and therefore closer to that of the original study. There were 26 females and 14 males (a less than undesirable ratio of 1.86 : 1) in groups which ranged in size from four to seven. More explicitly, there was one group of four members, three of five members, and three of seven members. Within these seven groups, six had females identified as being the leader, which is more than should have occurred by chance. Three of these female-lead groups had a male identified as being in the second place leadership position. This is consistent with previous research, where for approximately one-half of the workgroups with either male leaders or female leaders, a member of the other sex was in the second position.

Among these most recent seven workgroups, only one had a leader which changed absolutely the most of all group members. This was the only group of four, and was composed of two males and two females; the leader was identified as being a female. There was, however, a three-way tie for the leadership position between that female and the two males, which was broken by use of their concomitant potency dimensions. But even then, the "winning" female leader's

potency score was 8.00 compared with 7.67 for both males. It is the author's belief that these leadership scores for three of the four group members were too close, and that in this rare case group structure did not develop. This is the only instance of such close sociometric scores in the 44 work groups which have been used in this author's research to date. Perhaps this group should be discarded as not being a real group, and analysis focus upon only the six remaining groups. If that is done, then no leaders changed more than any of the other members of their respective groups, and four of the six leaders changed absolutely the least while coming to a unanimous group solution. One of the remaining two was extremely close to being tied for having changed absolutely the least (a summed summed differences squared difference of only four in a range from 14 to 220). All but one leader then did not change more than other members of their respective groups.

The correlation between the first (individual) and the second (unanimous group) normative solutions was $r' = .86$ in this most recent follow-up study. Unlike $r' = .32$ as shown in Table 7(b), $r' = .86$ is consistent with what would be predicted. The original study (Fulton, 1981) showed $r' = .98$, but all non-chosen "people to be saved" had received the same ranking value in that analysis. Unfortunately, seven groups compose too small an n to be dichotomized into 2×2 matrices as presented in tables 6 and 8, and then used to illustrate relationships as reported in tables 9 and 10.

But considering the most recent high correlation of the individual and group solutions, and the tendency for four (or five) leaders out of six to have changed less than the other members of their respective work groups, it appears that small group size may be responsible for the difference in results and for what appear to be non-significant results in tables 6, 8, and 9. The group n of seven is also too small from which to generalize to group diversity as a variable to predict the sex of the emergent leader. The systematically disproportionate over-representation of females within all groups but one is also a problem with this small sample size.

But, based on the results of the small post-study involving seven groups, of the alternatives considered on pages 59 and 60 here, it appears that the non-replication of the relationships as shown in Table 10 is most likely a function of smaller group size. It is known that aggregates of three, whether real groups or not, lend themselves more easily to coalition formation than do larger groups. In addition to the obvious "odd-person out", Simmel proposed that its antithesis is also a real possibility (Coser, 1965). Under these circumstances, the less powerful member may be sought for a coalition by either or both more powerful members who wish to gain advantage over their competitor. A potential for influence, then, could presumably lie with the lowest ranked member. Caplow (1959) further elaborated on this theme to describe and predict

coalitions as being both characteristic of and shifting within eight basic triad "types". Since a coalition of some type is likely to be the structure from which member interaction originates, triads are a special type of group. In the present study, one third of the work groups were triads.

Chapter 6

Summary and Heuristic Comments

None of the original five hypotheses were supported by the results from this study. There were, however, several methodological differences between the research which was attempted to be replicated (Table 10), and this project. Those differences were (1) the formats of the answer sheets for The Fallout Shelter Problem (Phase One and Phase Three), and (2) the sizes of the groups involved. Leadership as operationalized and measured within groups did not appear to have an influence upon the unanimous solutions made by the groups in this project. Beyond that, what theory predicts should have occurred was not only absent, but the results actually went contrary to what was expected. In addition to intra-group structure appearing to have had negative influence in terms of the groups' conformity with what emerged as normative solutions, none of the expected sex differences found in the previous study were supported.

The groups available for this present study were smaller than those for the study presented in Table 10. Of the groups in Table 10, only 1 of 21 real groups was a triad; the mean group size had been 5.52, and almost 90% of the group participants had been in groups of five or more members. In the present study, one third of all real group participants had been in triads. In an effort to make sense

of the discrepancy between what appeared to be overwhelming results in Table 10 and these more recent results, a small post-study was conducted in the fall of 1983. The methodology for the post-study was identical as that of this reported study, however the mean group size of 5.71 more closely approximated those groups reported in Table 10. The results of the small post-study support those relationships shown in Table 10.

It is known that triads are special kinds of groups in which influence at any given time is not necessarily related to the status structures which exist among their members. Based upon the results of the small post-study, it is believed by the author that the unstable patterns of influence within triads were responsible for the non-significant results. Should a large-scale study involving larger work groups (five to eight members) which is presently under way produce results similar to those in Table 10, then in addition to all five hypotheses which were tested here being supported, an additional statement will have been made concerning triads. The implications for forming or using ongoing triads with their characteristic and shifting coalition formations as policy or decision makers, rather than larger groups, will be broad.

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APPENDIX A
SOCIOMETRIC INSTRUMENT

Name _____

Group _____ Date _____

FOR EACH QUESTION, RANK YOUR ENTIRE GROUP

1. List in order, from most to least, the persons in your group who come up with ideas and suggestions that the group actually carries out. No ties. Include yourself.

Indicate with a slash mark across the line how much for each.

- | | very much | not at all |
|----------|-----------|------------|
| 1. _____ | { _____ } | |
| 2. _____ | { _____ } | |
| 3. _____ | { _____ } | |
| 4. _____ | { _____ } | |
| 5. _____ | { _____ } | |
| 6. _____ | { _____ } | |
| 7. _____ | { _____ } | |
| 8. _____ | { _____ } | |

2. List in order from most to least the persons in your group who do the most work toward group goals. No ties, and list yourself.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

6. List below an ideal group. If you had your choice of anybody you wanted to be in your group (excluding faculty), who would you have in the group? Present members may be included or left out. list below everybody you would want in the group. No ties, and include yourself.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

APPENDIX B
THE FALLOUT SHELTER PROBLEM

THE FALLOUT-SHELTER PROBLEM

Assume that all of the following is true. You can make no "changes" in the circumstances as they are presented here.

You are in charge of a department in Washington, D.C. that is responsible for experimental stations in the far outposts of civilization. Suddenly the Third World War breaks out and bombs begin dropping. Places all across the globe are being destroyed, and people are heading for whatever fallout shelters are available. You receive a desperate call from one of your experimental stations, asking for help.

It seems there are TEN people but there is only enough room for SIX people for a period of three months, which is how long they must stay down there to be safe. They realize that if they have to decide among themselves which six should go into the shelter, that they are likely to become irrational and begin fighting. So they have decided to call your department and leave the decision to you. They will abide by your decision.

But you must quickly get ready to try to save yourself, so all you have time for is to get superficial descriptions of the ten (10) people. You have only twenty minutes to make your decision, and then you will have to leave.

So you now have a half-hour to decide which four of the ten will have to be eliminated from the shelter. Before you begin, I want to impress upon you two important considerations: (1) It is entirely possible that the six people you choose to stay in the shelter may be the only six people left to start the human race over again. This choice is, therefore, very important. Try to make the best choices possible. (2) On the other hand, if you do not make a choice in a half-hour, then you are, in fact, choosing to let the ten people fight it out among themselves, with a high probability that more than four of them will perish. You now have exactly one half-hour. Rate your choices in descending order beginning with the one you consider to be most acceptable on the separate form supplied.

Here is all you know about the ten people:

- a. Bookkeeper; 31 years old
- b. His wife; six months pregnant
- c. Male black militant; second year medical student
- d. Famous female historian-author; 42 years old
- e. Male bio-chemist

(continued on next page)

- f. Rabbi or minister; 54 years old
- g. Female olympic athlete; all sports
- h. College co-ed
- i. Policeman with gun (they cannot be separated)
- j. Female actress, singer and dancer

APPENDIX C
ANSWER SHEET, PHASE ONE

Name _____

Date _____

Sex (circle one) Male Female

Age _____

There is no "correct" solution to this problem.

Rank your choices by letter (a, b, c, etc.) in the spaces provided, with your first (most acceptable) choice on the top (No. 1).

Your name is required for identification to allow statistical analysis, only. The information on this form shall be totally confidential.

THE FALL-OUT SHELTER PROBLEM

MOST acceptable: 1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____

In the event that one or more of the above either cannot enter the shelter or decides not to enter the shelter, continue ranking those persons NOT selected by you among your first choices.

7. _____
 8. _____
 9. _____
 10. _____

APPENDIX D
ANSWER SHEET, PHASE THREE

List each group member who is present at this time:

_____	_____
_____	_____
_____	_____
_____	_____

Date _____

Group Number _____

To be successful, you must unanimously agree as a group within twenty minutes.

There is no "correct" solution to this problem.

Rank your choices by letter (a, b, c, etc.) in the spaces provided, with your first (most acceptable) choice on the top (No. 1).

Your name is required for identification to allow statistical analysis, only. The information on this form shall be totally confidential.

THE FALL-OUT SHELTER PROBLEM

MOST acceptable: 1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____

In the event that one or more of the above either cannot enter the shelter or decides not to enter the shelter, continue ranking those persons NOT selected by you among your first six choices.

7. _____
 8. _____
 9. _____
 10. _____

VITA 2

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